Exploring and Changing Cognitive Representations, Coping and Quality Of Life Outcomes in Chronic Spontaneous Urticaria

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Index Page

"Poor quality of life and high psychological distress are prevalent outcomes in individuals experiencing chronic spontaneous urticaria. Not only do cognitive representations of chronic spontaneous urticaria predict quality of life and psychological distress significantly better than socio-demographic and clinical factors, it does so independent of coping procedures and is amenable to change via intervention".

Author quote of thesis novel findings
Delaney Bucknor

Declaration

I hereby declare that to the best of my knowledge and belief, no portion of the work referred to in the thesis has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning.

Copyright Statement

Dedication

'To my little companion Kimberly who was a therapeutic influence in the sometimes isolated activity that is a PhD. Rest in Peace' (16th June 1995 - 9th Nov 2010)

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Abstract

Chronic Spontaneous Urticaria (CU) is a pruritic skin disorder that affects 0.8% of the population. As its aetiology is not fully understood the aim is to control symptoms through medicines to improve quality of life (QoL). Demographic and clinical factors have been inconsistent and poorly predict QoL but one modifiable factor that has gained credence is ones illness representations. The Common-Sense Model (Leventhal, Meyer and Nerenz, 1980) postulates that these guide coping procedures that impact outcomes. The aim of the thesis was to examine whether CU representations (mediated by coping) predicted QoL and whether both representations and QoL in CU were amenable to change via intervention.

Preliminary studies undertaken validated CSM measures in CU and confirmed key reference values for CU-related QoL and its measurement. CU was seen as uncontrollable, emotionally arousing, chronic, cyclical, caused by stress and immunity with serious consequences and has a moderate impact on QoL (n=78). The necessity to take CU medicines equalled concerns about side effects. Cognitive representations were the strongest predictors of QoL explaining 35.0-60.6% of the variance independent of coping. Qualitative analyses presented CU as unsightly, uncontrollable and difficult to comprehend and self-regulate. Fifthteen participants undertook psych-education and action plans to change CU representations. Multivariate analyses found a strong within-group main effect on QoL outcomes (p<.001) and for aspects of outcome over time (all p<.001). Correlation based change analysis further inferred that targeting CU cognitions resulted in changing QoL outcomes over time. In summary the thesis supported that: poor QoL is prevalent in individuals experiencing CU. Not only do CU representations predict QoL outcomes, they are amenable to change via intervention as are QoL outcomes. Such findings have implications for CU-related QoL research and how health psychology-dermatology collaborations maybe instrumental to improving outcome through psycho-education interventions in routine care to facilitate better CU self-management.

Contents Page

List of Figures

List of Tables

List if Tables Continued

List of Appendices

List of Abbreviations

AMOS	Analysis of Moment Squares
ANCOVA	Analysis of Co-Variance
ANOVA	Analysis of Variance
ASST	Autologous Skin Serum Test
BAD	British Association of Dermatologists
BCT	Behaviour Change Techniques
BMQ	Beliefs about Medicines Questionnaire
BPS	British Psychological Society
CFI	Comparative Fit Index
CI	Confidence Interval
CU	Chronic Spontaneous Urticaria
CIU	Chronic Idiopathic Urticaria
CAU	Chronic Autoimmune Urticaria
CFA	Confirmatory Factor Analysis
CNS	Central Nervous System
CONSORT	Consolidated Standards of Reporting Trials
CRD	Centre for Reviews and Dissemination
CSM	Common Sense Model (used interchangeably with SRM)
CBT	Cognitive Behavioural Therapy
CU-Q_2oL	Chronic Urticaria Quality of Life Questionnaire
DLQI	Dermatology Life Quality Index
DPU	Delayed Pressure Urticaria
DSM-IV	Diagnostic and Statistical Manual Version 4
DSQoL	Disease-Specific Quality of life
EAAAI	European Academy of Allergy and Asthma Immunology
EDF	European Dermatology Forum
EFA	Exploratory Factor Analysis
GA2LEN	Global Allergy and Asthma European Network
GFI	Goodness of Fit Index
GMHS	Generic Mental Health Status
GPHS	Generic Physical Healh Status
GSST	Guy's and St Thomas Hospital
HADS	Hospital Anxiety and Depression Scale
HBM	Health Belief Model
HRQoL	Health Related Quality of Life
ICD	International Classification of Diseases
IPA	Interpretive Phenomenological Analysis

Abbreviations Continued

IPQ	Illness Perception Questionnaire
IPQ-R	Illness Perception Questionnaire-Revised
KMO	Kaiser-Meyer-Olkin statistic
LOCF	Last Observation Carried Forward
MANOVA	Multivariate Analysis of Variance
ML	Maximum Likelihood
MCS	Mental Component Summary Score
MRC	Medical Research Council
NFI	Normative Fit Index
NHP	Nottingham Health Profile
NHS	National Health Service
PCA	Principal Component Analysis
PCS	Physical Component Summary Score
PIS	Participant Information Sheet
PROs	Patient Reported Outcomes
PTSD	Post-Traumatic Stress Disorder
QoL	Quality of Life
RCT	Randomised Controlled Trial
R&D	Research and Development
REC	Research Ethics Committee
SEM	Structural Equation Modelling
RA	Representational Approach to Patient Education
RMSEA	Root Mean Square Error of Approximation
SPSS	Statistical Package for the Social Sciences
SF-36v2	Short Form 36-Item Health Survey (UK version 2)
SMART goals	Specific Measureable Attainable Realistic Time-bound goals
SRM	Self-Regulatory Model (used interchangeably with CSM)
TOTE	Test Operate Test Exit
UAS	Urticaria Activity Score
WHO	World Health Organisation
WHOQoL-BREF	World Health Organisation Quality of Life Questionnaire-Brief

Preface

Chronic Spontaneous Urticaria (CU) is the experience of itchy hives (*pruritus*) and skin swellings (angioedema) that persist after six weeks duration but typically last for years (Zuberbier, Grattan Maurer, 2009). CU has no cause and although bio-medical research has broadened our understanding of it, its current theories only partially explain it and cannot predict what interventions will improve outcomes, hence it is the urticaria that researchers, clinicians and patients describe as an "enigma" (Maurer, Grattan, Zuberbier, 2009).

In the absence of a cure patients must partake in daily self-regulatory behaviours to control symptoms by taking CU medicines and avoiding triggering factors, however CU medicines often result in sub-optimal treatment outcomes and eliciting factors are rarely identified. Consequently, it is not surprising that CU has detrimental effects on *quality of life*. How patients with CU plan for the future based on its unpredictability is often a concern, as experts themselves have no solid understanding of prognosis (Maurer, Weller, Bindslev-Jensen, Gimenez-Arnau, Bousquet, Canonica, et al. 2011) and it is common for health professionals to view these patients as 'difficult to satisfy and hard to guide' (Weller, Viehmann, Brautigam, Krause, Siebenhaar, Zuberbier and Maurer, 2012). It is argued that biomedical research has been a one-dimensional approach to studying a complex condition limiting opportunities to establish other factors that may explain some of the variance in CU outcome.

One such model that has gained credence is the Common-Sense Model or CSM (Leventhal, Mayer and Nerenz, 1980) that suggests chronically ill individuals construct lay perceptions of their illness to make sense of it. These together with emotional responses inform coping behaviours that impact outcomes. If perceptions significantly predict CU-related QoL and act as mechanisms for change, it may prove useful for experts communicating with these patients to challenge misperceptions and develop action plans that lead to better management.

Chapter 1

An Introduction to Chronic Spontaneous Urticaria

1.0: Chapter Scope and Aims

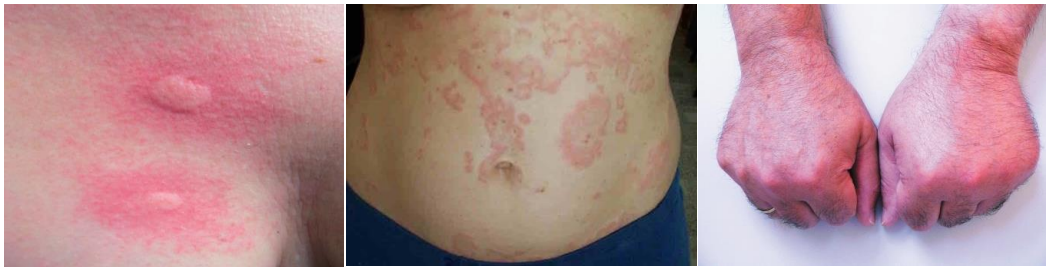
The aim of this chapter is to provide an introduction to chronic spontaneous urticaria (CU) by presenting an overview of its characteristics, pathogenesis, prevalence, and disease management. The thesis' outcomes quality of life and psychological distress are also introduced prior to exploring the Common-Sense Model as a useful framework for exploring predictors of both outcomes in Chapter 2.

1.1: Definition and Clinical Presentation

1.1.1: Definition and Characteristics

CU is defined as the *spontaneous* daily (or almost daily) presentation of pruritic cutaneous wheals (itchy hives) and/ or angioedema (swellings) for at least six weeks duration of no identifiable cause (Zuberbier et al. 2009a). Central to CU onset is the sudden presentation of a cutaneous wheal. As illustrated in Figure 1.1 below these are characteristically pale and pink in colour (Zuberbier et al. 2009a) and are usually accompanied by an inflammation of the surrounding skin. It is the pruritic (or itchy) nature of the wheals that is problematic and those who experience them describe the itch as *stinging*, *tickling* and *burning* with sensations of *heat* and actual *sweating* (Yosipovitch, Ansari, Goon, Chan, and Goh,

Figure 1.1: Urticarial Wheals and Angioedema on the Left Hand*



Left to right: Maurer and Grabbe, (2008); international CU Society (www.iicus.com) and *Maurer and Grabbe, 2008

2002). Pruritic wheals are fleeting and cyclical in nature and can last for 1 to 24 hours but there can be considerable overlap between cycles (Zuberbier et al, 2009a). Where wheals represent a superficial swelling of the upper skin layer, angioedema (Figure 1.1) embodies the appearance of a much deeper

swelling of the inner dermal and subcutaneous tissues, the experience of pain and a longer life cycle of up to 72 hours (Kaplan and Greaves, 2009; Zuberbier et al. 2009a). Angioedema symptoms are often reported on the facial areas (e.g. cheeks, lips and eyelids), tongue and feet (Kaplan and Greaves, 2009) and if severe this can result in anaphylaxis (Kaplan, 2004).

Urticarial wheals can occur anywhere on the skin but Maurer, Ortonne and Zuberbier, (2009a) found that the arms and legs were the most reported areas effected representing 56% of the sample but women reported significantly more symptoms on the legs, hands, face and scalp ($p < 0.05$). In line with Yosipovitch et al. (2002) Maurer et al. (2009) further found that 34% of patients reported that symptoms worsened in the evening and 55% reported them to worsen at night resulting in sleep disturbance (Maurer et al. 2009a; Zuberbier, Asero, Bindslev-Jenson, Walter Canonica, Church et al. 2009b). Further it is not unusual for patients to report headaches, stiff joints or gastrointestinal symptoms often explained by the inflammatory effects of histamine release (Maurer and Grabbe, 2008).

1.1.2: Classification and Diagnosis

The classification of CU usually comes after a complex process where urticaria subtypes of known aetiologies has been eliminated (Zuberbier et al. 2009). To add to the complexity of diagnosis a single patient may have multiple co-morbid physical or other urticarias (see Table 1.1 below).

Table 1.1: Co-morbid Urticaria Subtypes in CU*

Urticaria Type	Urticaria Subtype	Eliciting Factor
Physical urticaria	Cold	Cold objects, air, fluids, wind
	Delayed pressure	2-12 hours of vertical pressure, tight clothing
	Heat contact, solar	Localized heat
	Urticaria factitia/ dermographic	UV and/ or visible light
	Vibratory urticaria / angioedema	Vibratory forces
Other	Aquagenic	Water
	Cholinergic	Increase in core temperature
	Contact	Urticariogenic substance
	Exercise induced anaphylaxis/ urticaria	Physical exercise

*adapted from Zuberbier et al. 2009a

As a general rule European guidelines on urticaria (Zuberbier et al. 2009a) recommend that

they be classified by disease duration (acute or chronic), the frequency of symptoms and known causative factors. When symptoms persist for more than 6 weeks urticaria is deemed as chronic.

Researchers further classify CU into two subsets: chronic idiopathic urticaria (CIU) and chronic autoimmune urticaria (CAU), the latter reflecting research relating CU to autoimmune mechanisms (Bagnasco, Minciullo, Schiava et al. 2011; Kaplan and Greaves, 2009; Kurt, Aktas, Aksuet et al. 2011)CU is further determined by disease-activity using the gold standard urticaria-activity score (or UAS; Mylnek, Zalewska-Janowska Martus, Staubach, Zuberbier and Maurer 2008) but diagnosis is complicated CU can be both an illness and a symptomatic manifestation of another illness (Brodell and Beck, 2008). Consequently CU has numerous differential diagnoses including urticarial vasculitis, (Zuberbier et al. 2009a). The CU diagnosis itself is made after an evaluation of the patient's history, physical examinations and laboratory tests to rule out systematic diseases (Table 1.2).

Table 1.2: Urticaria Diagnostic Checklist*

1. Onset of disease
2. Frequency and duration of wheals
3. Diurnal variation
4. Occurrence in relation to weekends, holidays, foreign travel
5. Shape, size, distribution of wheals
6. Angioedema
7. Associated subjective symptoms of lesion (e.g. itch, pain)
8. Family and personal history regarding urticaria
9. Previous or current allergies, infections, internal diseases, or other possible causes
10. Psychosomatic and psychiatric diseases
11. Surgical implantations and events during surgery
12. Gastric/ intestinal problems (stool, flatulence)
13. Induction by physical agents or exercise
14. Drugs (e.g. NSAIDs, injections, immunizations, hormones, laxatives, alternative remedies)
15. Observed correlation to food
16. Menstrual cycle
17. Smoking habits
18. Type of work
19. Hobbies
20. Stress
21. Quality of life related to urticaria and emotional impact
22. Previous therapy and response to therapy

*Adapted from Zuberbier et al. (2009a)

Patients may undergo a pseudo-allergen diet to see if these are implicated and physical urticaria is determined using challenge testing (e.g. placing ice cubes onto the skin; Zuberbier et al. 2009a). Tests used in CU diagnosis are defined below (BMJ, 2011 or Saini, 2011, unless stated).

■ *Full blood count:* Identifies the presence of infectious diseases and presence of other illnesses.

■ *Erythrocyte sedimentation rate:* A non-specific test that provides evidence for the presence of urticarial vasculitis and other auto inflammatory syndromes.

■ *C-reactive protein (CRP):* A non-specific test that provides evidence for the presence of urticarial vasculitis and other auto-inflammatory syndromes.

■ *Thyroid-stimulating hormone/ Anti-thyroid antibodies:* Helps with CU aetiology as CU has been associated with antithyroid antibodies and autoimmune thyroid disease

■ *Autologous serum skin test (ASST):* A non-specific test to detect circulating auto-antibodies that trigger wheal-flare reactions (Sabroe, Grattan, Francis, Kobza Black and Greaves, 1999).

■ *Basophil histamine release assay:* A non-specific screening test that detects histamine-releasing autoantibodies from white blood cells (Grattan and Humpreys, 2007).

■ *Skin prick:* Allergy (Kaplan, 2004; Kulthanan, Jiamton, Rutnin, Ni-on, Insawang and Pinkaew, 2008).

Kozel Bossuyt, Mekkes and Bos (2003) in their urticaria systematic review found that over 20 laboratory tests can be requested for a single patient but CU guidelines recommend against such testing (Zuberbier et al. 2009a, 2014).

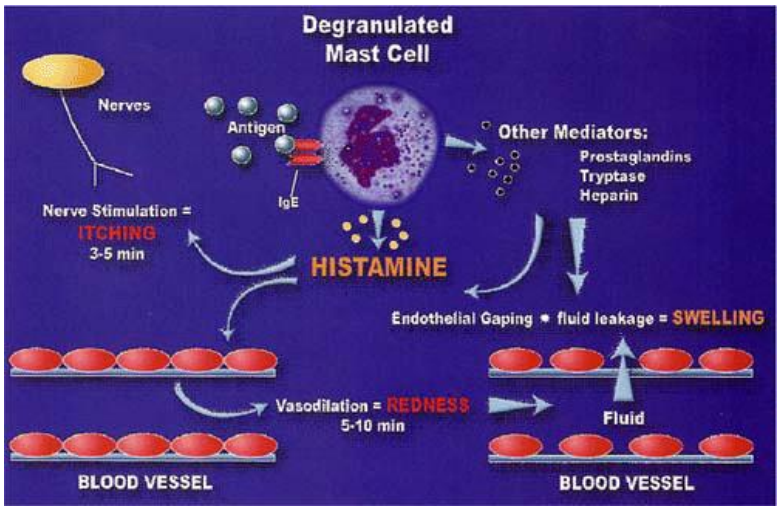
1.2: Pathological Process and Aetiology

1.2.1: Patho-Physiological Process

Even though little is known about CU aetiology the actual process is much better (if not completely) understood. There are many cells involved in CU but the major ones implicated are mast cells and white blood cells called basophils (Vonakis and Saini, 2005). Mast cells can be found in the skin and are normal involved in processes such as defending organ cells from external pathogens (Metz, Siebenhaar and Maurer, 2008). For this mast cells create chemicals known as mediators, the main one central to CU being histamine (Zuberbier, Grattan and, Maurer, 2009). As illustrated in Figure 1.2 (p5) mast cells become activated and begin to degranulate releasing histamine and other mediators by a known (e.g. IgE) or unknown triggering factor. Mediators allow the leakage of other mediators and cell

components (e.g. proteins, water, electrolytes) through the walls of the blood vessels that lay underneath the skin by increasing the permeability of the skins capillaries via vasodilatation (the relaxing of the muscles of blood vessels as depicted on the bottom right half of Figure 1.2.

Figure 1.2: CU Physiological Process



These capillaries eventually become too congested resulting in skin inflammation, swelling on the skin surface (wheals) and in the deeper compartments of internal organs (angioedema; Schocket, 2006). The sensation of itch occurs when pro-inflammatory mediators (e.g. histamine) activate neuro-physiological pathways in the brain (Paus, Schemiz, Biro and Steinhoff, 2006). This can result in individuals becoming involved in an itch-scratch cycle where the scratching itself provides short-term relief but then triggers further histamine release in response to skin damage that results in more itch.

1.2.2: Patho-Physiological Mechanisms

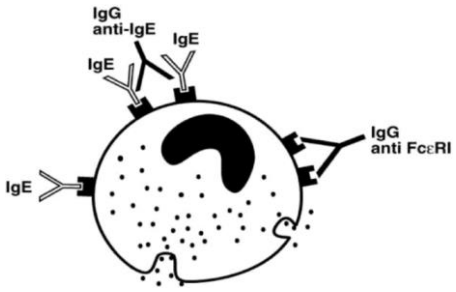
A definitive cause of CU is not yet established and none currently predict CU course or inform treatment (Saini, 2011). Current theories fall into allergic-immunological, non-allergic immunological and non-immunological categories (Grattan and Humpreys, 2007) and are reviewed below:

Allergic Immunological Mechanisms

The evidence that CU is caused by an allergic reaction to foods is poor (Kulthanan et al. 2008; Kaplan and Greaves, 2009). In susceptible individuals, the first time the allergen enters the body it is

seen as a pathogen. This signal stimulates the immune system to develop allergy-specific antibodies called immunoglobin-E (IgE) that is created to respond to foreign substances. If the substances subsequently enter the body and bloodstream again they may combine to food allergen-specific IgE antibodies attached to mast cells activating histamine release (see Figure 1.4).

Figure 1.4: Mast Cell with Functional Auto-Antibodies involved in CU*



*From Ortonne (2003)

2. Non-Allergic Immunological Mechanisms

Non-allergic immunological mechanisms differ in that agents other than IgE activate mast and basophils cells. These are reviewed below.

a) CU is an autoimmune disease

This research suggests that up to 45% of CU cases maybe implicated by autoimmune mechanisms. Ones immune system attacks its own thyroid gland and damage is caused by the formation of thyroid reactive T-Cells that penetrate the thyroid causing symptoms (Kaplan and Greaves, 2009; Sabroe and Grattan, 2006). This subset of CU is called chronic autoimmune urticaria (CAU). This theory stems from research suggesting that thyroid autoantibodies are more common in CU patients (approximately 30%) than the general population (5-10%; e.g. Bagnasco, Miniciullo, Saraceno, Gangemi and Benvenga, 2011; Sagdic, Sener, Bulucu, Karadurmus, Yamanelet et al. 2011). However, the severity of CU does not often relate to thyroid functioning and CU patients in studies usually have normal functioning thyroids (Kaplan and Greaves, 2009).

b) Histamine releasing factors from the patient's own serum or blood plasma

This research suggests that there is a substance in the patient's own sera that causes the

degranulation process and stems from positive ASST results to their own serum. In up to 50% of cases these substances usually identified as human immunoglobulins (or IgG) molecules have demonstrated that they are capable of starting the degranulation process in cells (Grattan, Hamon, Cowan, Kikuchi and Kaplan, 2002; Sabroe and Greaves, 2006; Saini, 2009). The shortcomings of this research again lie in the ASST and its non-specific results in patients with or without CU and health subjects (Konstantinou, Asero, Maurer, Sabroe, Schmid-Grendelmeier and Grattan, 2009).

C) Abnormal cell functioning of mast cells and basophils

These studies suggest a malfunctioning of mast cells and basophils in patients with CU where basophils with similar levels of cell histamine appear to be hypo-response to the anti-IgE auto-antibody and the escape of basophils to the skin during the degranulation process presents with lower basophil levels in CU patients than controls and correlates with disease severity (Greaves, Plummer, McLaughlan, Stanworth, 1974; Luquin, Kaplan, Ferrer, 2005; Caproni, Giomi, Volpi, Melani, Schincagliaet al. 2005; Grattan, Dawn, Gibbs and Francis, 2003). Studies have found that histamine release could be reduced via activating the IgE receptor but not other receptors in some CU patients (Cohen and Rosenstreich, 1986). Vonakis (2007) labelled these CU patients as 'responder' and 'non-responders' of IgE autoantibodies. However, the distribution of responders and non-responders do not correspond to those labelled as autoimmune or idiopathic (Kaplan and Greaves, 2009).

3. Non-Immunological Mechanisms

Research has linked CU to many non-immunological mechanisms but the main ones involve infectious agents, pseudo-allergens and drug reactions.

The strongest evidence for infectious agents comes from the bacterium *helicobacter pylori* (Wedi, Raap, Wieczorek and Kapp, 2010; Magan, Mishal, Schlesinger and Scharf, 2007; Di Camli, Gasbarrini, Nucera, Franceschi, Ojetti et al. 1998) that weaken the stomach wall allowing digestive juices to pass through. Wedi et al. (2010) reviewed helicobacter pylori in CU across 22 studies between 1994 and 2008

and found that when the bacterium is eradicated from infected patients, symptoms are significantly reduced or go into remission, however more research is necessary in determine its role in CU pathogenesis (Shakouri, Compalati, Lang and Khan, 2010).

CU has also been linked to pseudo-allergenic substances that mimic true allergic reactions. including food additives, foods rich in histamine, sulphites and nitrates (Mageral, Pisarevskaja, Scheufele, Zuberbier and Maurer, 2010; Bunselmeyer, Laubach, Schiller Stanke, Luger and Brehler, 2009; Henz and Zuberbier, 1998; Haustein, 1996) however non-steroidal anti-inflammatory drugs (NSAIDS) including ibuprofen and aspirin can induce pseudo-allergenic reactions (Mastalerz, Setkowicz and Szczeklik, 2005).

1.2.3: Personality and Psychological Mechanisms

There is a growing research literature on the role of personality and psychological factors as a cause of CU and this has primarily focused on CU personality traits and stressful life events.

Psychological Stress

The effect of psychological stress in the onset and maintenance pruritus in skin disorders has been postulated (Milard, 2005; Gupta and Gupta; 2004; Picardi and Abeni, 2001). Exactly how psychological stress as a non-immunological mechanism is related to CU process is not completely understood however research strongly suggests a role for stressful life events. Fava, Perini, Santonastaso and Fornasa (1980) found that patients with CU (n= 20) reported experiencing stressful life events prior to disease onset and Berino, Voltolini, Fiaschi, Pellegrini, Bignardi, et al. (2006) assessed 30 patients with CU via semi structured interviews and confirmed that most had experienced a stressor within six months of disease onset. Stressors included bereavement, job stress, family problems and accidents. Malhotra and Mehta (2008) found that 16% of 16 patients had experienced a stressful life event within the year preceding CU onset and replicated the themes reported by Berrino et al. (2006). Using cluster analysis, Yang, Sun, Wa and Wang (2005) found that 6 months prior to onset patients with CU (n= 75) had higher weightings for stressful life events, somatic symptoms, severe insomnia, less

family support and negative coping than tineapedis patient controls (n= 133). Further in a study by Chung, Symons, Gillian and Kaminski (2010a), of 100 patients with CU 34% met the diagnostic criteria for post-traumatic stress disorder and were 1.89 times more likely to have this than allergy controls independent of disease severity. This study supports the argument that CU is a form of post-traumatic stress disorder (PTSD) that requires further investigation (Gupta and Gupta, 2012; Hunkin and Chung, 2012). Such studies contribute to understanding CU process but limitations lay in the retrospective way stress has been measured and in determining the direction of the relationship.

Personality

Personality theories propose that pre-dispositional factors within individuals makes them more susceptible to developing illnesses (Baiardini, Abba, Ballauri, Vuillermoz and Braido, 2011; Willemsen, Roseeuw and Vanderlinden, 2008). CU itself has a history of being related to personality traits (Shipman, Shoemaker, Levine and Mally, 1959); Buffet, 2003) including alexithymia (i.e. difficulties self-regulating emotions) placing CU within a stress-diathesis model. However studies in this area like stressful life events have been retrospective so cause and effect has not been established. Pasaoglu, Bavbek, Tugcu, Abodoglu and Misirligil (2006) assessed personality traits and psychological status in 59 patients with CU and concluded that these individuals were more depressive, hysteric, touchy and suspicious with hypochondriac tendencies compared to health controls. They also appeared more in conflict with their social environment and needed perfectionism, external control, and love and approval from others. Barbosa, Freitas and Barbosa (2011a) similarly reported that those with CU experienced problems dealing with emotional arousal. Further 56.9% reached the diagnostic criteria for alexithymia that correlated strongly with an insecure attachment style, psychopathological symptoms and defence mechanisms that turn against the self, independent of clinical variables. Other studies have also reported similar findings in CU (Maniaci, Epifanio, Marino and Amoroso; 2006; Conrad, Geiser, Haidi, Hutmacher, Liedtke and Wermter, 2008; Ugus, Engin and Yilman, 2008; Staubach, Dechene, Metz, Magerl, Siebenhaar, et al. 2011).

Personality and stressful life event have also been implicated in the on-going maintenance of skin disorders. How such variables upon impact the thesis' outcomes CU-related quality of life (QoL) and psychological distress will be discussed further in Chapter 2. Other factors have also been implicated in the origin/ maintenance of chronic skin disorders and these have included appearance schemas, illness representations, illness-related feelings/ distress, coping behaviours and socio-cultural factors (Thompson, 2005). As these individual socio-cognitive variables are yet to be comprehensively explored in CU and act as components of the Common Sense Model (the theoretical framework that will be used to explore new predictors of CU-related QoL) they will also be reviewed in Chapter 2

1.3: Prevalence

1.3.1: General Prevalence

Determining how prevalent CU is in the United Kingdom (UK) general population and beyond is difficult to establish as no studies have been undertaken (Maurer, Weller, Bindslev -Jensen, Gimenez-Arnau, Bousquet, Canonica et al. 2011; Maurer et al. 2010). Consequently data predicting who will be at risk of developing CU in the future is limited especially as a cause is unknown. The only study to report the prevalence of CU under current guidelines is that by Zuberbier, Balke, Worm, Edenharter and Maurer (2010) in 4093 German individuals. Zuberbier et al. (2010) found a CU lifetime prevalence of 1.8% (95% CI 1.4- 2.3%) and 12 month pre-assessment period prevalence of 0.8% (95% CI 0.6 - 1.1%). In studies of individuals with CU who also have physical urticaria between 33-67% experienced wheals and angioedema, 29-65% wheals only and 1-13% angioedema only (Maurer et al. 2010).

1.3.2: Gender, Age and Other Socio-Demographic Factors

It is unanimous from study data that women outnumber men by a ratio of at least two to one, irrespective of geographical location or time. (Maurer et al, 2011). Why this is so has not been formally studied. In contrast CU is prevalent at all ages but there is a consensus across studies that a substantial proportion of patients tend to be between twenty to fifty years old (Silvares et al. 2007; Kulthanan et al. 2007; Ferrer, 2005; Kozel et al. 2001; Sibbald, Cheema, Lozinski and Tario, 1991)

CU studies are inconsistent in what socio-demographic variables they report beyond age and gender, however CU appears irrespective of occupational, financial, educational or marital status, geographical location or ethnicity (Ferrer et al, 2009; Zuberbier et al. 2010; Gaig et al. 2004; Bakke et al. 1990) but exceptions exist. Herrmann-Kunz et al. (1999) and Silvares et al. (2007) reported a higher prevalence in urban city areas as well as those with high economic status and White ethnicity.

1.4: Treatment and Disease Management

1.4.1: Treatment

Treating CU is complex as patients present with idiopathic aetiologies and many also have concurrent physical urticaria hence treatments are diverse. However, CU management guidelines are the same for all patients (Zuberbier et al. (2009b). The first strategy is to avoid the cause or eliciting mechanism but this is usually avoiding the acerbating factors as to the causes (Zuberbier et al. 2009b). Approaches include avoiding drug induced hypersensitivities and physical stimuli (tight clothing), eradicating infectious agents, treating inflammatory processes and reducing autoantibodies (Zuberbier et al., 2009b). Further, for some patients identifying pseudo-allergens can help reduce symptoms. The primary treatment for CU is H_1 antihistamines and it is not unusual for clinicians to prescribe doses of up to 4 times the licensed recommendations (Maurer et al. 2011). H_1 antihistamines are preferred over H_2 varieties that can cause sedation, impaired psychomotor functioning and reactions with alcohol and drugs (Zuberbier et al. 2009b). In up to 50% of patients H_1 antihistamines are unresponsive (Mauer et al. 2010) and other drug treatments including immunological therapy and phototherapy are used (Bingham, 2008; Engin, Ozdemir, Balevi and Mevlitoglu, 2008).

1.4.2: Self-Management and Treatment Adherence

CU is managed on an outpatient basis and this requires patients to partake in health behaviours to control symptoms. Despite being provided with treatment advice during dermatological consultations Maurer, Ortonne and Zuberbier (2009a, b) in their European survey of 321 patients with CU found that although 78% were taking CU medicines only 33% took them preventatively, hence most waited until

symptoms began before starting treatment. Additionally 50% reactively used anti-itch lotions, a quarter did not avoid triggers to an outbreak and a third did not take medicines. Further, of the 83% of patients with CU under physicians care only 44% reported discussing symptoms that were not responding to treatment. There are health psychology theories that attempt to explain such behaviours and one explanation is that these individuals hold perceptions of their CU that effect how they cope and behave (Leventhal and Cameroon, 2003). For example twenty-five percent of patients in the Maurer et al. (2009a, b) survey believed CU to be a sign of personal weakness and a large proportion perceived that its emotional aspects were not addressed by health professionals and felt insufficiently educated about it. Illness perceptions indeed are said to develop from exposure to socio-cultural influences (e.g. doctors) and personal illness experiences. Illness perceptions and coping as components of the CSM (the model applied in this thesis) will be reviewed in detail in Chapter 2.

1.5: Health Outcomes

1.5.1: Physical Course and Prognosis

Little is known about CU's natural course and of the studies reporting data most have used selected study samples and findings have varied considerably. Twenty to 47% of patients reported going into remission after 1 year of onset (Kulthanan, et al. 2007; Toubi, Hessal, Avshovich, Bamberger, Sabo, Nusem and Panasoff, 2004; Kozel, Mekkes, Bossnyt and Bos, 2001; Julin, 1981) however this might be dependent on the healthcare service level. For example Van der Valk, Moret and Kiemeney 2002) evaluated 372 patients from a tertiary clinic from 1968 to 1990 and found a 29% remission rate but this was after five years of disease onset. Those experiencing CU for five to eight years have been reported to be between 11-15% (Gaig et al. 2004; Toubi, et al. 2004; Julin, 1981) and for ten years as high as 51% (Van der Valk et al. (2002).

Few studies have reported data predicting the course of CU but Maurer et al. (2010) found consistent patterns across studies. Those diagnosed with more severe CU experienced more angioedema; a positive reaction to their own skin serum and concurrent physical urticaria appeared to

have the worst prognosis. Data across studies suggested that two years from diagnosis 64-70% of those with moderate-severe CU still experienced symptoms compared to those with mild CU who were symptom free (43-48%). Further 30% of moderate-severe patients continued to experience symptoms after 5 years. After one year 43-48% of those with wheals still had symptoms whereas this was much greater in those with wheals plus angioedema (64-70%) or angioedema only (80%) and this was also true for those with CU and physical urticaria.

1.5.2: Socio-Economic Impact

Even though the healthcare costs of CU have not been evaluated in the UK, the diagnostic process of the condition as well as the fact that patients need to take oral medication daily to control symptoms and attend specialist clinics (in addition to GP visits) suggests an socio-economic impact. Even though health services differ between countries, one often-cited European study provides some insight into what needs to be costed. Kapp and Demarteau (2006) explored costs (e.g. medications, medical procedures, hospitalisation, workdays lost) in 294 French patients for one month and reported total incurred annual costs of €2128.00 per patient (£1834.78).

1.5.3: Quality of Life

CU is now known to significantly impact quality of life and prior to the first documented study by O'Donnell and colleagues in the late 1990's (O'Donnell et al, 1997), CU was described as a relatively 'benign' non-life threatening condition with little impact on patient's psychosocial functioning and QoL compared to other conditions (Grob Revuz, Ortonne, Auquier and Lorette, 2005; Grob and Guaudy-Marqueste, 2006; Yosipovitch and Greaves, 2008). Using the Nottingham Health Profile (Hunt and McKenna, 1985) O'Donnell et al. (1997) published the reports of 147 patients with CU and discovered that almost half reported poor energy levels (47%) aand a third sleep problems (32.4%). Further 29% had experienced emotional reactions and 13.3% negative social interactions due to having CU. Mobility (7.1%) was also impeded for some. Further analysis (see Table 1.3, p14) revealed problems in at least 38-56% of activities related to areas of daily life. As expected O'Donnell et al (1997) found itching

Table 1.3: Aspects of Daily Life Affected by CU- NHP*

	Interests/ hobbies	56.0
	Social life	51.0
	Sex life	47.3
	Work	40.0
	Looking after the home	40.0
	Holidays	48.0
	Home relationships	38.5

*Adapted from O'Donnell et al. (1997)

swelling and pain as the most bothersome as well as affects on home management, personal care, social interaction, emotions and work (Table 1.4 below). Individuals were more affected if they also experienced angioedema and physical uticaria. In a second key study Poon, Seed, Greaves, Seed, Greaves and Kobza-Black (1999) used the Dermatology Life Quality Index (DLQI) confirmed that those with CU and co-morbid physical urticaria reported more impairments but these were also comparable to severe atopic dermatitis outpatients and worse than patients with psoriasis, acne and vitiligo.

Table 1.4: Aspects of Daily Life Affected by CU- Study-Specific Questionnaire*

Domains	Item examples	Affected (%)
Home Management	Housework, cooking, gardening, temperature regulation	49-71
Personal care	Choice of clothes/ footwear	71
	Avoid changing rooms	57
	Washing temperature	58
	Diet restrictions to improve CU	54
Recreation & Social interaction	Restricted exercise, social life curtailed	----
	Cancelled social events,	73
	Sexual relationships	73
Mobility	Take shorter distances (always/ sometimes)	12/ 43
	Unable to run (always/ sometimes)	10/ 35
	Avoid prolonged standing (always/ sometimes)	18/ 42
Emotional factors	Self image (e.g. less attractive, self-conscious, embarrassed)	46
	Anxiety – Condition would worsen/ Unpredictability of CU	42
	- Believe CU caused serious condition	25
	- Afraid of choking/ breathlessness	20
Sleep/ Rest	Disruption	38
	Interference	54
	Daytime relaxation	41-50
Work	1+ days lost (mean 6.4, range 1-31)	56
	Performance deterioration	74

*Adapted from O'Donnell et al. (1997)

Further Baiardini, Giardini, Pasquali, Dignetti, Guerra et al. (2003) used the SF-36 and confirmed that individuals with CU experienced worse QoL than those with respiratory allergy and healthy adults. Berrino et al. (2006) using the NHP and DLQI confirmed previous studies that these patients had higher levels of psychiatric co-morbidity than the general population and had suffered from at least one major and significant stressor six months prior to disease onset. These key studies also collectively provided support that QoL is still impaired when socio-demographic and clinical variables are controlled for.

Chronic Urticaria Related Quality of Life Measurement

An observation of the key papers published on CU-related QoL above highlight that studies have used different QoL instruments to examine this relationship including measures of generic health status (i.e. SF-36, NHP) and disability (DLQI; Finlay and Khan, 1994) that miss important disease-specific information. Consequently although the impact of CU on outcomes is evident, comparison across studies is difficult in terms of indicating the intensity of this impact and which areas are most affected as instruments present with diverse items and domains. Baiardini and colleagues (2005) developed the Chronic Urticaria Quality of Life Questionnaire (CU-Q_2oL) however consensus guidelines for assessing patient reported outcomes (PROs) and QoL in urticaria (Baiardini et al. 2011) highlighted the lack of reviews on the CU and QoL literature to gain an overall picture of the nature of this phenomenon and prognostic factors. A pilot search of the literature (using Medline, EMBASE and PsychINFO) by the current author (DB) confirmed that no systematic reviews existed. In light of this it was decided to undertake a systematic review of QoL in CU as a preliminary study to create consensus reference values on QoL in CU for comparative purposes in the thesis' proceeding studies.

1.5.4: Anxiety and Depression

Anxiety and depression are two of the most implicated co-morbidities in CU (Berrino et al. 2006; Staubach et al. 2011) there is strong evidence to support that individuals with CU who report poorer QoL also tend to report significantly higher psychological distress (Staubach et al. 2006a; Engin et al. 2007; Ozkan et al. 2007; Uguz et al. 2008; Barbosa et al. 2011b), the reason psychological distress has been

chosen as a secondary outcome. To review the literature an electronic database search of Pubmed using the terms *chronic urticaria, anxiety, depression*, *psych** and *co-morbidity* was undertaken. The findings provided strong evidence suggesting that individuals with CU experience high levels of anxiety and depression implicated not only in CU outcome but also its aetiology and maintenance (Buffet, 2003) suggesting a bi-directional relationship. For example Fava, Perini, Santonastaso and Fornasa (1980) found that those with CU had not only experienced a stressful life event immediately before disease onset but also experienced significantly more anxiety and depression than fungal infected controls. Gupta, Gupta, Schork and Ellis (1994) further found that clinical depression can modulate perceptions of pruritus (i.e. itch perception) in CU, but also considered that the depression could also be secondary to the pruritus itself. To support this further Berrino et al. (2006) interviewed 30 individuals with CU of which nearly two-thirds had experienced a stressful life event six months prior to CU onset associated with depression and anxiety and Chung, Symons, Gillianand Kaminski (2010a) in a CU sample of 100 patients found that these individuals where 1.8 times more likely to have a post-traumatic stress disorder (PTSD) than those with allergy and this PTSD significantly related to psychiatric co-morbidity.

The prevalence of anxiety and depression in CU is difficult to determine as studies have consisted of heterogeneous samples (e.g. Os-Mendendorp, Eland de Kok, Grypdonck, Bruijnzeel-Koomen et al. 2006; Coskun et al. 2005). Referring to the database search of CU co-morbidity it was revealed that studies consisted largely of females in their mid-thirties to forties (see Table 1.5, p17 below) and despite the limited number of studies reflects the typical socio-demographic representation of this patient population described in section 1.3. Prevalence rates of anxiety and depression varied considerably from 12% to 76.1% for the former and 17% to 43.3% for the latter. The discrepancies between studies may be explained by the range of screening and diagnostic instruments used and sample characteristics, although in most instances around a quarter to a third score above the cut-off point for at least mild disorder. What was consistent were that individuals with CU suffered significantly

Table 1.5: Socio-demographic Characteristics and Prevalence of Anxiety and Depression in CU

First Author	N	Gender	Age	Instruments		Anxiety	Depression
		Female	Years	Diagnostic	Screening	Prevalence (%)	Prevalence (%)
Badoux & Levy 1994◊	74	-------	----------	NR	BSI*	----------	----------
Barbosa (2011)	55	78.0%	45.3 ± 16.1	DSM Interview	HADS**	76.10%	NR
Berrino (2006)	30	83.3%	44.0 (21-40)	DSM Interview	BDI***	25.00%	25.00%
Bzoza (2011)	54	63.0%	33.0 median (19-46)	NR	STAI▲ / BDI	NR	24.00%
Chung (2010)	100	82.0%	46.5 ± 14.10	NR	GHO-28▼	NR	NR
Conrad (2008)	55	87.0%	49.6% 18.5	DSM Interview	SCL-90R•	NR	NR
Engin (2007)	73	58.9%	27.0 ±10.8	NR	BAI/ BDI	NR	NR
Hashiro & Kuma (1994)	30	NR	39.1 ± 15.7	NR	MAS◦/ SDS◄	40.00%	43.30%
Ozkan (2007)	84	84.0%	36.83 ± 10.26	SCID-1	NR	12.00%	40.00%
Staubach (2011)	100	69.0%	43.80 ± NR	MINI-DIPS	HADS/ SCL-90R	30.00%	17.00%
Uguz (2008)*	30	68.2	36.84 ± 12.90	SCID-1	NR	13.50%	43.30%

NR: Not reported

◊Some data missing as information taken from abstract, as paper could not be retrieved

*Brief Symptom Inventions, **Hospital Anxiety & Depression Scale, ***Beck Depression Inventory, ▲Spielberg State-Trait Anxiety Inventory, ▼General Health Questionnaire-28, •Symptom Checklist 90-Revised, ◦Manifest anxiety scale, ◄Self-rating Depression Scale

*All scores for Axis 1 diagnosis only

higher anxiety and depression than health controls (Barbosa et al. 20011b; Bzoza et al. 2011; Engin et al. 2008; Uguz et al. 2008; Conrad et al. 2008; Hashiro and Kuma, 1994; Badoux and Levy, 1994; Sheenan-Dare et al.1990) and patients with allergy (Chung et al. 2010b).

Predictors and Prognosis

Individuals with CU appear to experience anxiety and depression irrespective of gender, age, marital or occupational status (Barbosa et al. 2011b; Uguz et al. 2008; Berrino et al. 2006), however one study found that women were more affected than men (Badoux and Levy, 1994) and Barbosa et al. (2011b) found significant differences for educational status where Uguz et al. (2008a) did not. Individuals with CU also appear to experience both co-morbidities regardless of clinical variables (Barbosa et al. 2011b; Uguz et al. 2008a; Ozkan, Oflaz, Kocaman, Ozseker, Gelincik and Buyukozturk, 2007; Chung et al. 2010b). Studies have further found that anxious and depressed individuals with CU are more likely to score near cut-off points for other psychiatric co-morbidities than those with CU alone (Staubach et al. 2011; Barbosa et al. 2011a; Chung et al. 2010b; Maniaci et al. 2006). In this thesis psychological distress will also be explored within the CSM to determine cognitive representations as predictors excluding participants with co-morbidities that my act as co-variates.

1.6: Conclusions

Bio-medical approaches to CU do not completely explain CU process nor inform what interventions improve outcomes. Because CU is a multi-faceted illness, the thesis proposes that understanding CU more bio-psychosocially through socio-cognitive models may further help to understand it more and inform new interventions adjunct to medical care. CU places great demands on those who experience it. Consequently, it is not surprising that CU has effects on quality of life outcomes. There is now strong evidence to support that individual's across illnesses hold cognitive representations of their illness that (through coping behaviours) predict illness outcomes including QoL and distress, hence these predictors my help explain some of the variance in CU outcome yet explained. Perceptions, coping and outcome within the Common Sense Model is reviewed in Chapter 2

Chapter 2

The Common Sense Model: Self-Regulatory Process and Intervention

"It's been 3 years since I have been diagnosed with CIU [chronic idiopathic urticaria]. My allergist ran numerous tests to find a cause but it was useless. However I think stress triggers it because I noticed that when I am highly stressed it will appear...this is not a fact though. CIU is so unpredictable. You could be free of it one day and the next day, you wake up with a swollen lip, eye or nose. I really hate when that happens. It saddens me because there are times that I'm so swollen and itchy that I can't go to work or even go out. .My allergist prescribed Allegra but I think my body has grown accustomed to it so I started taking Zyrtec...it works well .I really wish there was a real cure for CIU!"
Woman with CIU, Patient Experience UK forum (www.patient.experience.co.uk)

2.0: Chapter Scope

It has been proposed that an individual's response and adaptation to chronic illness is best explained as a self-regulatory process (Di Ridder and Di Witt, 2006; Cameron and Leventhal, 2003). The Common Sense Model (or CSM) focuses on explaining how one comes to represent beliefs about their illness. In chronic spontaneous urticaria (CU) this is important as illness perceptions have been found to guide coping actions and predict outcomes (Hagger and Orbell, 2003). This chapter reviews the CSM, the literature supporting its' components (cognitive representations) as predictors of quality of life and psychological distress and studies of the CSM in dermatological conditions and interventions. The chapter ends with the thesis research questions.

2.1: Self-Regulation of Health and Illness

2.1.1: Self-Regulation

It has been suggested that any system able to problem solve has the ability to self-regulate (Powers, 1973). Self-regulation is said to be a human being's inherent ability and motivation to set meaningful goals and achieve them through directed behaviours that remove barriers to those goals (Scheier and Carver, 2003). The concept of self-regulation itself in psychology is a considerable leap in the understanding of human behaviour as prior to Bandura's Social Cognitive Theory and the concept of self-efficacy (Bundura, 1977) cognitive processes and behaviours where theorised as independent of the motivational and external socio-cultural influences that may impact them (DeRidder and De Wit, 2006). There are differing approaches to understanding self-regulation (e.g. Baumeister, Bratslavsky, Muraven

and Tice, 1998; Prochaska and DiClemente, 1984) however they do share the communality of placing the individual as an active component of behaviour, focusing on purposeful goals and making efforts to reach them through volitional processes (see Dr Ridder and De Wit, 2006 for a review). One such approach is underpinned in Cybernetic Control Theory (Miller, Galanter and Pribram, 1960). In this simplistic conceptual model self-regulation is governed through a TOTE (i.e. Test, Operate, Test, Exit). Firstly the problem-solving system needs to *test* its existing position (the input stimuli) against an appropriate reference value before it can then *operate* a sequence of events to reduce the discrepancy between the two. It then undergoes another *Test* to determine if the desired outcome is fulfilled. If solved the system will *Exit,* if not it will feedback to operate and try again until this is achieved. It is this simple mechanism that lays the foundation of generic self-regulation theories such as that by Scheier and Carver (2003) but motivation and self-efficacy can be impacted by external influences and it is these factors that bring the socio-cognitive element to such models when applied to human behaviour.

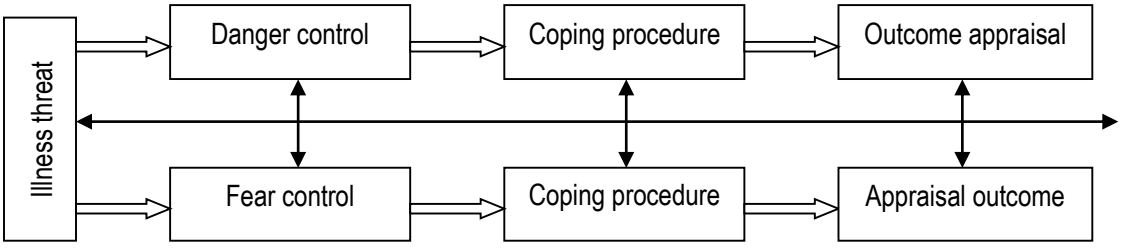
The CSM was extensively developed by Leventhal and colleagues (Leventhal, Meyer and Nerenz, 1980; Leventhal, Nerenz and Steele, 1984; Leventhal, Diefenbach and Leventhal, 1992) is a step further from Scheier and Carver's model in that it contains both the framework (that explicitly shows what is being regulated) and the specific contents presenting how this self-regulation is achieved. A core feature of the CSM is the assumption that the goal of self-regulating illness is not only one of dealing with and resolving the physical self (i.e. those concrete perceptual experiences of bodily sensations and symptoms of illness) but also the subjective self: the emotional responses to illness threat (Leventhal, Brisette and Leventhal, 2003). The strategies adopted to regulate the self are said to be dependent on how the illness was originally interpreted and the resources available to achieve better health influenced by ones socio-cultural environment. Socio-cognitive models of health behaviour such as the Theory of Planned Behaviour (TPB; Ajzen, 1991) and Health Belief Model (HBM; Rosenstock, 1974) contain basic elements of self-regulatory processes but tend to emphasise intentions towards changing specific acts which is not the same as the higher order nature of goal setting, as one does not always carry out ones

intentions, and further one may act against them (de Ridder and De Wit, 2006). Similarly the concept of perceived control is not the same as goal striving through volitional processes as individuals do not always undertake behaviours they believe are within their control. Equally socio-cognitive models focused on attitudes towards change (Theory of Reasoned Action or TRA, Ajzen and Fishbein, 1980) do not fully explain the impact of social relationships on self-management. Even though a positive evaluation of an action by others may create a norm promoting it, it says nothing about the role the social environment plays in acquiring the skill of that action, how effective the observation of important others were or how both can shape the representation of health threat and self-management (Cameron and Leventhal, 2003). The CSM differs from these models in that intentions/ attitudes towards health threats are not only concrete (e.g. experiencing symptoms, emotions), but abstract cognitive (discussed later).

2.1.2: The Parallel Response Model

The CSM itself is a more content driven version of the Parallel Response Model (Leventhal, 1970) presented graphically in Figure 2.1 below.

Figure 2.1: The Parallel Response Model



The parallel response model emerged as a successor to the Fear-Drive model by Doller and Miller (1950) who used it to theorise the impact of fear communication on health behaviours. Applied to health, fear was assumed to be a motivational state, hence procedures undertaken to reduce the fear could be reinforced and learnt. Leventhal and colleagues carried out a series of experiments to test these assumptions. In summary it was hypothesised that a high fear message (e.g. smoking kills) teamed with an action plan (attend clinic) would be more effective in eliciting adherent health behaviours (stop smoking) than low fear messages teamed with an action plan. It was found that high fear messages were

more effective in changing attitudes to change but this effect only lasted for one to two days. More detrimental was that the impact of the high fear message was not significantly better than the low fear message in eliciting actual health behaviours, however as the action plan alone was a poor predictor of taking up behaviours, it was evident that the fear itself was still a necessary factor in eliciting attitudes and behaviour (e.g. one will not attend a vaccination appointment if there is no fear of contamination). They proposed a *parallel response model* hypothesising that in the face of an illness threat one holds not only a cognitive representation of the fear that requires coping procedures for fear control (emotional responses) but also a cognitive representation of the illness that also requires coping strategies for danger control, These processes occur in parallel and serve as the interpretation of the illness threat (the input) against where one wants to be: healthy and emotionally regulated (the reference value). It is the interpretation of these processes that guide the *operation* of coping procedures (i.e. do something or nothing) that are appraised to determine if congruency has occurred (test) and if not act as the feedback mechanism to try something else until the outcome is satisfactory.

2.2: The Common-Sense Model of Illness Perceptions (CSM)

2.2.1: The Symmetry Rule

As highlighted in Section 2.1.2 motivation to change behaviours in the face of an illness threat was not due to fear communication but by some component of it being interpreted by representations of fear and perceived danger driving a motivation to adopt coping procedures. Experiments allowed for conclusions to be drawn suggesting that motivation was driven for danger and fear control (i.e. cognitive and emotional representations) based upon the individuals concrete subjective sensations and experiences of symptoms (or procedures), their interpretation of them and at the same time by referring to higher order cognitive schemas of how these sensations and experiences are interpreted. Johnson and Leventhal (1974) demonstrated this bi-level phenomenon in patients undergoing an endoscopy (procedure involving a tube being inserted down the oesophagus). They found that if the patient interpreted the procedure as a threat they were more likely to become anxious and gag during the

procedure, however if they were primed beforehand that the procedure was non-threatening (i.e. changing the cognitive schema of the concrete sensations) and given instructions for coping, the fear was reduced or diminished resulting in less gagging (as the concrete sensation was deemed normal or less threatening). Research by Meyer, Leventhal and Gutman (1985) further demonstrated that this bi-level phenomenon was not only limited to emotional fear but was evidently also true for illnesses identity. In patients with hypertension they found that 90% held concrete perceived experiences of their condition (e.g. face flushing), which from their cognitive schema indicated what that, meant (e.g. blood pressure going up). In contrast, 80% of this sample also reported that people could not actually tell when their blood pressure was going up (knowledge in cognitive schema) and this was represented by a concrete experience (I have no symptoms). Meyer et al. (1985) termed this incessant need to connect bi-level concrete (bottom-up) and abstract (top-down) processes (i.e. linking symptoms to labels and with this label identify symptoms) as the *symmetry rule*.

In a further key study Easterling and Leventhal (1989) determined how the symmetry rule affected the parallel representation of fear (or emotion). They found that regardless of whether women had cancer in the past or never at all, those who had experienced non-cancer symptoms were more likely to worry about getting future cancer if they perceived that this was more of a reality for them. In line with this, those who reported no symptoms, although believing that cancer would occur in future reported no fear. In contrast women who experienced symptoms but perceived them to be unrelated to cancer also worried less. Cameron and Leventhal (2003) equate these processes as similar to Schachter and Singer's (1962) theory of cognitive labelling (a bottom-up physiological arousal and its top-down interpretation creating emotional responses).

2.2.2: Symptom Perception and Social Messages

Leventhal's CSM proposes that individuals deal in parallel with the emotional and illness perceptions of an illness threat, however it also hypothesises how these representations initially develop through one's personal experiences of illness. Much of the initial research on symptom perceptions was

undertaken by Pennebaker and colleagues (Pennebaker and Skelton, 1981; Pennebaker, 1982; Pennebaker, 1983) who demonstrated in a series of studies how one perceives symptoms is influenced to some degree by how much one focuses on internal states and how this is interpreted from their cognitive schema. In one study participants were led to believe that an ultrasonic sound would either lead to an increase in skin temperature or a decrease while a third group were told nothing about what the outcome should be. They found that those who were primed cognitively to expect a temperature rise reported more increases in their temperature change and their finger getting warmer as emitted through a thermostat. The opposite was reported for those expecting a temperature drop. The pertinent part of this study was that the ultrasound was faked and the temperature remained constant across all participants. It was concluded that schemas could influence reports of somatic body sensations in a concrete or abstract way. The reporting of the sensations confirmed what was expected from the ultrasound signal, however focusing more intensively on internal body sensations was found not to equate to the accuracy of the sensation. In the CSM, it is these symptom perceptions that are subject to individual differences in interpretation that form representations of danger and fear.

Not all cognitive representations develop though symptom perceptions as how one interprets present or future symptoms might be influenced by one's socio-cultural environment. It is not unusual for individuals to form their knowledge of illness, what to expect from it and how to interpret it from others such as family, friends and work colleagues (Scambler, 1981). This information seeking has been termed as one's *lay referral system* (Freidson, 1970) where decisions of whether to visit the pharmacy or seek professional help maybe influenced by a significant other who has experienced similar symptoms. Also a formal diagnosis might be provided by a GP and research has suggested that how this is presented can affect how the individual interprets the illness as a problem (Ogden, Branson, Bryett, Campbell, Febles, Ferguson et al. 2003). In their study Ogden et al. 2003 found that individuals felt that they were being taken more seriously and were more trusting of the doctor's ability when presented with the illnesses medical term as to the lay. Further Taylor and Ogden (2005) found that the description of an

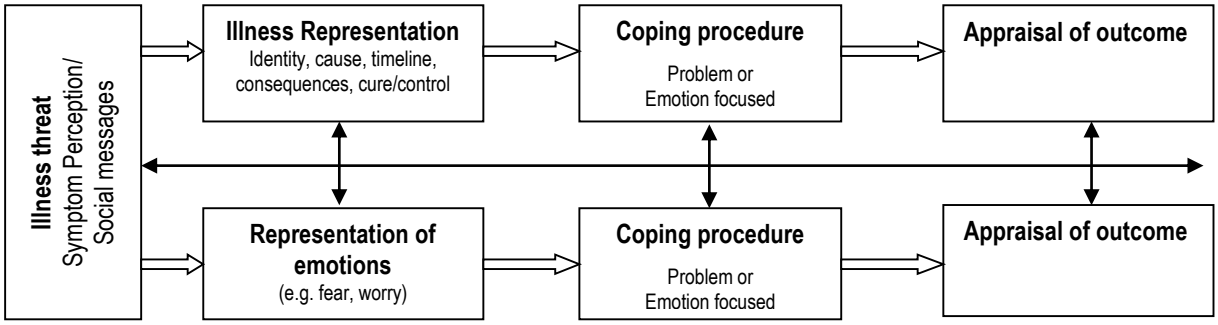
illness as *heart failure* as to *fluid on the lungs due the heart not pumping enough* lead to perceptions of more devastating consequences and higher psychological distress. Individuals are also surrounded by media messages of illness threats and culture and religion can further affect how symptoms are interpreted (Zoller and Worrell, 2006; Liddell, Barrett and Bydawell, 2005). Zoller and Worrell (2006) looked at how audiences interpreted depictions of multiple sclerosis from the television drama West Wing using qualitative methodologies and found that individuals made self-comparisons with the depictions which consequently had both physical and social consequences in terms of the accuracy and meaning of the perceived messages. Liddell et al. (2005) reviewed the literature on sub-Saharans illness representations of acquired immune deficiency syndrome (AIDS) and found that although biomedical and traditional depictions of its cause complemented each other, beliefs about its prevention conflicted as biomedical approaches challenged the integrity of cultural values and denied people in the culture the opportunity to shift blame outside of the self and their own behaviour.

2.2.3: Support for Components of Cognitive Representations

Even though symptom perceptions and social messages are said to influence the development of cognitive representations, it is the content specific components of these representations that have been the dominant focus of CSM research. In section 3.2.1 the symmetry rule was first introduced describing how individuals experience symptoms, search for abstract information and find a schema (or label) for that experience that in it is based on concrete evidence undertaken by searching for body sensations (Meyer et al. 1985). The development of the CSM in the late seventies was dominated by symptom (or illness) identity as a core domain, however later studies using semi-structured interviews, open-ended questionnaires and factor analytical techniques (Lau, Bernard and Hartman, 1989; Bishop and Converse, 1986, Lau and Hartman, 1983; Baumann, 2003) consistently found that regardless of the illness, illness perceptions (components of a cognitive representation) tended to cluster around the following five core dimensions (also depicted in the CSM diagram in Figure 2.2, p26).

- ***Identity:*** Original core domain involving applying labels to symptoms and symptoms to labels (e.g. 'I am itching so I have hives' or 'I am about to break out in hives, I will itch)
- ***Cause:*** Beliefs about what caused the illness (e.g. psychological stress caused my hives);
- ***Timeline:*** Perceptions of illness duration (acute/ chronic) and reoccurrence (cyclical nature).
- ***Consequences:*** The perceived severity and bio-psychosocial impact of the illness
- ***Curability/ controllability:*** Beliefs about whether the illness can be cured or controlled.

Figure 2.2: The Common-Sense Model



The development of the illness perception questionnaire (IPQ; Weinman, Petrie, Moss-Morris and Horne, 1996) provided a standardised way of measuring illness perceptions across differing illnesses, allowing for a more detailed study of the components and how they relate to other CSM components. The use of the IPQ lead to further developments as factor analysis of participant IPQ data provided evidence to suggest that individuals may construct perceptions of illness timeline, duration and reoccurrence separately (Moss-Morris, Weinman, Petrie, Horne, Cameron and Buick, 2002). Further the items representing the cure/ control domain were found to load onto two factors named *personal control* beliefs and *treatment control* (Moss-Morris et al. 2002). These lead to the development of the Revised Illness Perception Questionnaire (IPQ-R; Moss-Morris et al. 2002) consisting of additional domains representing illness coherence (i.e. understanding the illness) and emotional representations lacking in the IPQ and also featured in the Brief IPQ (Broadbent, Petrie, Main and Weinman, 2006).

Whatever the instrument applied, the systematic analysis of cognitive representations allowed

Hagger and Orbell (2003) to undertake a meta-analytic review consisting of a diverse range of chronic illnesses over 45 studies that provided further strong support for the five dimensions. A major finding was that individual illness perceptions significantly inter-correlated in similar and very predictable patterns. In summary positive relationships were found between the identity, timeline and consequences subscales and negative relationships were found between these three subscales and the curability/control subscales. Hagger and Orbell (2003) have argued that individual factor analyses are not necessary as data from generic and disease-specific versions of the IPQ and IPQ-R have produced similar findings. Factor analyses in cervical cancer (Hagger and Orbell, 2005), myocardial infarction (Brink, Alsen and Cliffordson, 2011) and diabetes (Abubakari, Jones, Lauder, Kirk, Devendra and Anderson, 2011) have largely supported this viewpoint however Wittkowski, Richards, Williams and Main (2008) failed to replicate the IPQ-R factor structure in atopic dermatitis.

2.2.4: Coping

Even though much of the research on the CSM has focused on cognitive representations they are said to guide coping procedures. In line with self-regulation theory, coping procedures are the action plans to achieving goals for fear and danger control. Its position in the model as a mediator separates coping in the CSM to that of generic coping models (Lazarus and Folkman, 1984; Scheier and Carver and Weintraub, 1989) as cognitive representations act as antecedents influencing how to cope. This cognition-coping link is known as the IF-THEN rule (Anderson, 1983; Brownlee et al. 2000).

The IF-THEN rule

The IF refers to the cognitive representation that help to define outcome expectancies and the THEN is the coping action (e.g. IF my symptoms get worse THEN I must visit my GP). As the relationship between both is bi-directional, the appraisal of the coping action may also change the cognitive representation. Coping actions are related to causal attributions in that perceiving a stomach ache to be caused by food may result in taking over the counter medications; however perceiving it to be caused by a stomach tumour may result in a GP visit, but goals must be relevant in terms of disease management,

hence outcome expectancies also result from perceptions of consequences, timeline and dose-responsive curability/ controllability beliefs. For example a relevant goal for a headache is to take painkillers, however individuals have their own timeline for when this procedure will work (e.g. twenty minutes). Further curability/ control expectations will be dependent on the strength of the dosage taken. In summary IF-THEN rules have been linked to heuristics that govern them including the symmetry rule described extensively earlier, the stress-illness rule (i.e. attributing symptoms to acute stress; Cameron, Leventhal and Leventhal, 1995) and the age-illness rule (attributing symptoms to aging; Leventhal et al. 2003; both associated with the avoidance/ delay of seeking help) and the duration rule (i.e. perceiving long illness timelines with worse disease severity; Mora, Robitaille, Leventhal, Swigar and Leventhal, 2002) and the prevalence rule (perceiving rare illness as more severe; Kahneman and Tversky, 1973).

Risk Perceptions

A second aspect of the IF-THEN rule is considering the risks and benefits of the coping procedure. For example if one believes that a medicine is addictive despite its effectiveness, this will impact on whether the coping action will be implemented. Risk perceptions (or collectively a risk representation) have been studied in terms of likelihood and severity estimates that are postulated to be underpinned by the individual perceptual components of illness representations that are driving emotions and behaviours (Cameron, 2003). The illness perceptions of identity, cause and timeline are associated with the generation of likelihood estimates of whether one will become ill whereas consequences and controllability are said to act as severity estimates and like the perceptions eliciting them, do so as concrete-perceptual (bottom-up) and abstract-conceptual (top-down) processes. Firstly the risk that one is in disease progression may emerge from identifying concrete symptoms as a risk indicator (e.g. I'm showing signs of more hives) and linked to a clear abstract label for the risk (e.g. acceptance of diagnosis from doctor). Likewise risk can be estimated by cause concretely (e.g. visions of parent being ill) and abstractly (e.g. the illness is genetic) and timeline in terms of abstract perceptions of when particular illnesses occur (e.g. diabetes in mid 40's) and concrete evidence (e.g. 'I'm in my forties so at risk'). In

terms of severity, individuals may have concrete images of how worsening symptoms will impact on social life with abstract knowledge of this possibility from others and controllability in terms of severity appraisals (e.g. the risk of not utilising strategies for control). Risk representations have been shown to act independently of emotional representations that influence how information is processed in that worry has been demonstrated to predict behaviour where risk judgement has not. For example Cameron and Diefenbach (2001) found that worrying about breast cancer (as to perceived risk) predicted an interest in genetic testing. Interestingly in another study Cameron, Booth and Schlatter (2003) found evidence suggesting that worry and risk can have opposing influences. They studied worry about re-occurring breast cancer and found that perceived risk was not highly related to worry, in fact the risk perception reduced women's reported alcohol intake whereas worry increased it, despite high levels of motivation to adopt new behaviours to reduce risk.

Despite studies like the ones described above (including those on cognitive representations), few studies have been published examining how coping procedures and IF-THEN rules are held in one's cognitive schema, however a recent study by Henderson, Orbell and Hagger (2009) found that the effective use of a coping strategy in the past is assimilated into ones episodic and working memory, hence this representation elicits the goal strategy and not personality traits of coping and actions that are less amenable to change. To demonstrate this Henderson et al. (2009) primed participants who had either used lozenges or not as a coping strategy (with a control group) for illness words related to the common cold. Measured by response time, individuals who were primed or were past users of the coping procedure did show more attention bias for both the common cold and its remedy. More traditionally relationships between illness perceptions and coping tend to find that a strong identity, chronic timeline and serious consequences positively relate to emotional expression and avoidance/ denial coping behaviours (Hagger and Orbell, 2003) and cure/ control perceptions in contrast to greater use of cognitive appraisal/ problem focused coping and seeking social support.

Measuring Coping as a Mediator between Illness Perceptions and Outcomes

The section so far has focused on coping behaviours and the antecedent influence of cognitive representations (i.e. the IF-Then rules) however the purpose of such coping procedures in the CSM is to attain goals to better outcomes (see Figure 2.2, p26). Indeed, a considerable proportion of research to date has found illness perceptions to bear significant relationships to a range of health and illness outcomes. For example, Illness perceptions have been found to be significant predictors of treatment adherence (Telles-Correia, Barbosa, Mega and Monteir, 2012; Whitmarsh, Koutantji and Sidell, 2003; Jessop and Rutter, 2003) and help seeking behaviours (Hurt, Burns, Brown and Barrowclough, 2012; Pryce, Metcalfe, Hall and Claire, 2012; Lawson, Lyne, Bundy and Harvey, 2007) as well as physical disability in gout (Dalbeth, Petrie, House, Chong, Leung, Chequdi et al. 2011) and survival rates in haemodialysis patients (Chilcot, Wellsted and Farrington, 2011). The most pertinent findings have been summed in Hagger and Orbell's (2003) meta-analytic review of 23 conditions across 45 studies.

In their meta-analysis Hagger and Orbell (2003) found that a high illness identity, perceptions of serious consequences and a chronic timeline significantly related to lower scores on adaptive outcomes (e.g. QoL, health status) and higher scores on maladaptive ones (e.g. psychological distress. Further illness perceptions have been found to be significant predictors of QoL and psychological distress, which as the respective primary and secondary outcomes of the current thesis will be reviewed, in further detail later in the chapter. Much of this research has been cross-sectional in nature but more recently published longitudinal studies do support this effect across illnesses (Griva, Davenport, Harrison and Newman, 2012; Chaboyer, Lee, Wallis, Gillespie, Jones, 2010; Kaptein, Bijsterbosch and Scharloo, 2010; Fischer, Scharloo, Abbink, vanHul, van Ranst and Rudolphus, 2010), however the relationship between representations and outcome is said to be mediated by coping (see Figure 2.2) Even though studies have regressed coping behaviours on outcome finding it a significant contributor in certain aspects with illness perceptions (Lawson et al. 2007; Whitmarsh et al. 2003) very few studies have tested for mediation in the CSM (Hagger and Orbell, 2003) and of those that have findings have been mixed. Where some have

established some mediation (e.g. Evans & Norman, 2009; Rutter and Rutter, 2002), others have failed (e.g. Hurt, Burns, Brown and Barrowclough, 2012; Scharloo, Kaptein, Weinman, Hazes and Willems, 1998; Scharloo, Baatenburg de Jong, Langeveld, van Velzen-Verkaik and Doorn-op den Akker, 2005; Bergman and Rooijmans, 1998; Heijmans, 1998; Kaptein, Helder, Scharloo, Van Kempen, Einman, Van Houwelingen andRoos, 2006; Kemp, Morley and Anderson, 1999; Moss-Morris, Petrie and Weinman, 1996). Studies using the CSM to explore predictors of QoL and psychological distress outcomes are reviewed in section 2.3 (p36).

Even though they did not test for mediation in their meta-analytic review Hagger and Orbell (2003) argued that studies might have failed to establish mediation is because they have used generic measures of coping. However, as there are studies showing a meditational role for coping using such measures (e.g. Lawson et al. 2007; Rutter and Rutter, 2002; Whitmarsh et al. 2003) this view is questionable. As the role of coping in the CSM is conflicting, it will be tested as a mediator in the thesis.

2.2.5: The Extended CSM: Treatment Perceptions

Treatment perceptions

This chapter so far has reviewed the CSM as a way of operationalising illness perceptions however studies in the late 1980's to 1990's (e.g. Conrad, 1985; Fallsberg, 1991; Britten, 1994; Morgan and Watkins, 1988) led Horne (1997) to propose that individuals also have representations of their treatment. For example Britten (1994) explored beliefs about medicines in 30 patients via semi-structured interview and found themes related to perceptions of the properties of medicines, preferences of taking/ not taking medications and usage. They concluded that patients take medicines but also worry about side effects. Further Conrad (1985) undertook 80 interviews regarding patient's medication management and concluded that what doctors perceived as non-adherence was often the patient's attempt to regulate illness through remaining independent, de-stigmatised and developing their own practice, themes replicated later by Shoemaker and Ramalho de Oliveira (2008).

The theorisation of treatment perceptions originally stemmed from trying to understand why patients did not adhere to prescribed medicines as the earlier literature tended to focus on their ability to take medicines (e.g. misunderstanding instructions, forgetting) but ignored the role of motivation (Horne, 1997, 2003). Although it is an important outcome the aim of the thesis was to keep the study of cognitive representations of illness and treatment to adding something novel to the relationship between CU and its impact on quality of life (QoL) and psychological distress. Further treatment perceptions is being studied here in relation to how it relates to illness perceptions as part of the overall model fit of an extended common-sense model of both quality of life and psychological distress as CU outcomes. Relationships between illness and treatment perceptions are reviewed in further detail later.

Evidence for Treatment Perceptions and Measurement

Horne and Weinman (1999) conducted further research on 1200 individuals with a diverse range of conditions including cardiovascular disease and renal impairment and found that the need to take similar medicines differed among individuals with the same illness. For example while some believed that their health depended on medicines, others believed that medicines would protect them from getting worse or from being constantly ill, however a fifth of patients were unsure about the necessity of their medicines. Overall they found that patient's perceptions of their prescribed medicines or treatments could be themed into one of the following two dimensions:

- ***Specific necessity:*** Perceptions of the necessity of taking medicines/ treatments as prescribed
- ***Specific concerns:*** Concerns about the negative side effects of medicines or treatments.

Horne (1997) noted that necessity and efficacy beliefs were not the same as a patient might see a treatment as effective in controlling symptoms but feel that they do not need it. Studies regarding patients concerns about their medicines suggested that concrete experiences of negative side effects and the daily intrusiveness of medication routines teamed with fears about long-term usage (e.g. addiction, harm to body) appeared to be consistent across illnesses and cultures (Horne et al, 1999; Horne and Weinman, 1999). Concern beliefs may also be influenced by their perceptions of personal sensitivity to the side-

effects of 'harmful' treatments and the overuse by doctors (Horne, Faasse and Cooper, Diefenbach, Leventhal, Leventhal et al. 2013). Early findings led to the development of the Beliefs about Medicines Questionnaire (BMQ; Horne, Weinman and Hankins, 1999) which provided a more systematic way of assessing treatment perceptions which also reflected further themes regarding general concerns about the harmful effects of medicines (*general harm*) and their overuse by doctors (*general overuse*). Since it's development subsequent studies have been able to replicate the necessity and concerns factor structure and general harm and overuse dimensions (e.g. Mahler et al. 2012, De las Cuevas, Rivero-Santana, Perestelo-Perez, Gonzalez-Lorenzo, Perez-Ramos and Sanz, 2011; Iihara, Suzuki, Kurosaki, Morita and Hori, 2010; Francis, Wileman, Bekker, Barton, Ramsay and REFLUX Trial Group, 2009) supporting the hypothesis that individuals hold cognitive representations of treatment. As the thesis is only concerned about views regarding disease-specific treatment, the remainder of this section will be limited to the necessity-concerns framework.

Mechanisms of Treatment Perceptions

Even though necessity and concern beliefs are two distinct concepts the necessity-concerns framework (Horne, 2003) proposes that individuals have to balance the benefits of taking prescribed medications or treatments against the costs (i.e. a cost-benefit analysis). For example a medication may relieve symptoms short-term but cause harmful side effects long-term. The literature on necessity-concern beliefs suggest that patients tend to believe more in the necessity of their medicines (range 64-90%) and hold fewer concerns (32.0%- 47.7%; e.g. Nicklas, Dunbar and Wild, 2009; Neame and Hammond, 2005; Horne, Sumner, Jubraj, Weinman and Frost, 2001, Horne and Weinman, 1999) and with few exceptions (i.e. disease severity) this appears to be unrelated to socio-demographic and clinical variables. Findings also suggested that necessity beliefs positively correlated to treatment uptake and the reverse was evident for concerns (e.g. Horne and Weinman, 1999; Nicklas, Dunbar and Wild, 2009; Neame and Hammond, 2005). The balance between these beliefs is technically known as the *necessity-concerns differential* and Horne (2003) drew parallels of this to concepts described in the Health Belief

Model (Rosenstock, 1974) and Transtheoretical Model (Prochaska and Diclemente, 1984) respectively but within the CSM necessity-concern beliefs are influenced by parallel emotional representations of treatment and also cognitive and emotional representations of illness.

Relationships between Illness and Treatment Perceptions

Horne (2003) hypothesised that a decision to take medicines stem from one's illness perceptions as well as one's treatment beliefs. Like the original CSM individuals hold parallel perceptions of treatment and an emotional representation of the treatment that are all interacting with representations of illness threat and the emotional responses to the illness. In order to decide whether to take medicines the ill individual must create common-sense coherence between the representation of both illness and treatment before establishing whether the illness is severe enough to warrant the treatment options available. In terms of symptom identity, the experience of symptoms may elicit a medication usage coping response also reinforced by a necessity belief in taking them, however symptoms can also be perceived as a negative side effect of medicines or treatments reinforcing concerns about taking further doses and creating emotional responses. In terms of timeline, perceiving an illness as cyclical when it is chronic due to an absence of symptoms may result in not taking medications on a regular basis (Horne and Weinman, 1999). Likewise perceiving illness to have serious consequences may reinforce medication necessity beliefs (Nicklas et al, 2010) and as found by Figueiras, Marcelino, Claudino, Cortes, Maroco and Weinman (2010) perceptions of serious consequences, a chronic timeline and a high illness identity can reinforce concerns in spite of reinforcing necessity beliefs. Further medication necessity beliefs may be reinforced by beliefs that the condition can be cured or controlled (Horne and Weinman, 2002; Figueiras et al. 2010) but this has been found to be true for the efficacy of the treatment and not the personal control beliefs of overcoming illness (Horne and Weinman, 2002). Causal attributions have been found to be poorly correlated to necessity beliefs (Horne, 2003).

In some circumstances the distinction between cognitive representations of illness and treatment beliefs become blurred, as individuals may actually perceive their prescribed treatments as the health

threat in a similar way one would hold an emotional representation of an illness threat. This may further impact on necessity-concern beliefs as well as perceived consequences and timeline and pose a threat to one's self-identity (Horne, 2003). Under these circumstances it has been proposed that individuals may hold an illness cognitive component that represents their perceptions about different types of treatments as they do for illness. For example one may have an ideal representation of symptoms, what they represent and the type of treatment they warrant. These idealisations or prototypical beliefs of the illness (e.g. cause, timeline, consequences) and treatment must be coherent with the types of treatment being offered by health professionals to be persuasive enough for uptake (Horne, 2003). For example Figueiras et al. (2010) found that hypertensive patients with negative illness and treatment perceptions significantly preferred branded medications over those with positive perceptions who were more likely to choose generic versions. As stated earlier adherence is not an outcome of the thesis but such a study is an example of exploring relationships between illness and treatment perceptions and their impact on an area that is related to (but not) adherence.

Empirical Support for the Extended CSM

As stated earlier much of the research into treatment perceptions as part of exploring the extended CSM has been predominantly routed in the treatment adherence literature (with a notable absence of exploring a role for coping behaviour). For example Horne and Weinman (2002) explored the role of illness and treatment perceptions in explaining non-adherence to preventer medication in one-hundred patients experiencing asthma using the IPQ-R and BMQ and Medical Adherence Report Schedule (MARS) and found that non-adherence was significantly related to less necessity and more concern beliefs and perceptions of serious illness consequences. Further analyses also supported the hypothesis that illness and treatment perceptions were better predictors of adherence than socio-demographic and clinical factors, which explained little of the variance in outcome. In a second example Nicklas et al. (2010) studied adherence to treatment in chronic pain and found that patients holding perceptions of serious consequences and high emotional responses had more specific concerns about

medication and were less adherent, however serious illness consequences were also associated with stronger beliefs about the necessity of medicines and greater adherence. With a few exceptions (i.e. Byrne, Walsh and Murphy (2005) finding that illness and treatment perceptions only predicted 2% and 7% of adherence respectively in coronary heart disease), similar findings have been replicated in other chronic illnesses (e.g. Ross, Walker and MacLeod, 2004; Bishop, Yardley, Lewith and 2008; Aflakseir, 2012). The importance of these findings is that they mirror illness perception in that specific-concerns about treatment as a cognitive representation can be said to be associated with maladaptive outcomes (non-adherence) and necessity beliefs with adaptive ones (adherence) as would be expected. The next sections become more specific and consider CSM research in relation to the thesis outcomes and studies that provide preliminary evidence for the existence of cognitive representations in CU.

2.3: Cognitive Representations, Quality of Life and Psychological Distress

2.3.1: Illness Perceptions and Quality of Life

As reviewed in Chapter 1, quality of life (QoL) is a critical outcome of chronic illnesses, particularly as QoL measurement is said to provide a more comprehensive assessment of overall functioning from the patient's own perspective. This importance is further reflected in the CSM research literature where the aim has been to test CSM components as possible predictors of QoL independent of socio-demographic and clinical variables. The review in this section is based on non-systematic searches from PubMed-Medline, Embase and psycINFO electronic databases.

Cognitive Representations, Coping and Quality of Life

The research exploring relationships between CSM components and QoL (see Table 2.1, p38) provide strong evidence that illness representations are significantly related to poorer QoL (e.g. Rutter and Rutter, 2002; Spain, Turbrid, Kilpatrick, Adams and Holmesi, 2007; Llewellyn, McGurk and Weinman, 2007a,b; Timmers, Thong and Dekker, 2008; Dorrian, Dempster and Adair, 2009; Stafford, Burk and Jackson, 2009; Chaboyer, Lee, Wallis, Gillespie and Jones, 2010; Sawicki, Sellers and Robinson, 2011;

Tiemensma, Kaptein, Pereira, Smit, Romijn and Biermasz, 2011a,b; Le Grande, Elliott and Worchester, 2012; Telles-Correia et al. 2012), however in line with the research literature the role of copng as a mediator has been inconsistent. For example in one cross-sectional study of 209 individuals with irritable bowel syndrome, Rutter and Rutter (2002) found that perceptions of serious consequences (p <.001) and poorer curability control (p<.01) strongly related to poorer QoL. Further, path analyses supported both a direct predictive relationship between consequences and QoL and a partial mediating role for generic COPE strategy of acceptance; however in contrast Dorrian, Dempster and Adair (2009) found that in a CSM of inflammatory bowel disease illness perceptions explained a considerable 21% of the variance in QoL as compared to coping (as measured by the COPE) which only explained 2%, concluding coping to be an insignifican mediator between coping and outcome.

Table 2.1: Studies of Cognitive Representations, Quality of Life and Psychological Distress

First Author	Design	Cognition	Coping	QoL Measure	Psychological distress	Mediation
Chaboyer 2010	Longitudinal	IPQ-R	NA	SF-36	NA	Untested
Chilcot (2011)	Cross-section	IPQ-R	NA	NA	BDI II	Not tested
Dempster (2011)	Cross-section	IPQ-R	Cancer Coping	NA	HADS	No
Dorian (2009)	Cross-section	IPQ-R	Questionnaire	IBDQ-British FLP	HADS	No
Evans & Norman (2009)	Longitudinal	IPQ-R	COPE	N/A	HADS	Partial
Fu (2011)	Cross-section	IPQ-R	MCMQ	NA	HADS	Untested
Griva (2010)	Cross-section	IPQ	NA	NA	BDI	Untested
Griva (2009)	Cross-section	IPQ	NA	SF-36	NA	Untested
Hemele (2007)	Cross-section	IPQ-R	NA	NA	POMS	Untested
Kaptein (2006)	Cross-section	IPQ	NA	SIP	N/A	No
Knibb & Horton. (2008)	Cross-Section	IPQ-R	COPE	GHQ,	PSS	Partial
Llewellyn (2007a)	Longitudinal	IPQ-R, BMQ	COPE	SF-12, QIQ-C30	LOT-R, SCIP	Untested
Llewellyn (2007b)	Cross-section	IPQ-R, BMQ	Brief COPE	EORTC QLQ-C30, SF-12, PGI	HADS	Yes
McCabe & Barnason (2012)	Cross-section	IPQ-R	Brief COPE	NA	SCL, PMS	Untested
Rutter & Rutter. (2002)	Cross-section	IPQ	COPE	Global question	HADS	Complete & Partial
Sawicki (2011)	Cross-section	IPQ-R	COPE	CFQ-R	NA	Untested
Scarloo (2005)	Cross-section	IPQ-R	NA	EORTC QLQ-C30	NA	Untested
Scarloo (1998)	Cross-section	IPQ	NA	SF-20	NA	Untested
Spain (2007)	Cross-Section	IPQ-R	Utrecht Coping List	SF-36	HADS	Untested
Stafford (2009)	Longitudinal	IPQ-R	NA	SF-36	HADS	Untested
Telles-Correia (2012)	Cross-section	IPQ-R	NA	N/A	HADS	Untested
Tiemensma (2011)	Cross-section	IPQ-R	NA	PSC, EuroQoL, ACroQoL	NA	Untested
Tiemensma (2012)	Cross-section	IPQ-R	NA	PSC, EuroQoL5D, CushingQoL	NA	Untested
Timmers (2008)	Cross-section	IPQ-R	NA	SF-36	NA	Untested

IPQ: Illness Perception Questionnaire, **IPQ-R:** Illness Perception Questionnaire Revised, **BIPQ:** BriefIllness Perception Questionnaire, **BMQ :** Beliefs about Medicines Questionnaire, **PMS:** Profile of Mood States, **IBDQ:** Inflammatory Bowel Disease Questionnaire, **FLP**Functional Limits Profile, **SF-36** Short-Form 36 Item Health Survey, **POMS**: Profile of Mood States **EORTC QLQ-C30:** European Organization for Research and Treatment of Cancer Quality of Life Questionnaire **MCMQ:** Medical Coping Modes Questionnaire

One of the arguments in the CSM literature is that generic coping measures maybe an explanation for the lack of mediation shown between representations and outcome (see Table 2.1, p38), however as these two examples demonstrate in similar illnesses this is not always the case, however another explanation maybe in the choice of QoL instrument used in studies which has varied from the generic to disease-specific which can result in different findings. For example in a cross-sectional study of baseline data in patients with head and neck cancer Llewellyn, McGurk and Weinman, 2007a) found that illness identity (with age and depression) and emotional representations (with depression and the COPE strategies alcohol and drugs) explained 35% and 54% respectively of the variance in physical QoL and mental QoL as measured by the generic SF-12, but not the Patient Generated Index (PGI) individual QoL instrument. Another issue to be mindful of in CSM studies are that most are cross-sectional which not only has consequences in not knowing the direction of relationships but how representations affect outcomes overtime. Llewellyn, McGurk and Weinman (2007b) demonstrated this in a prospective study where baseline representations were unable to predict QoL (measured both generically and specifically) at 1 and 6-8 month follow-up.

Of significance in Table 2.1 is the numbers of studies exploring CSM predictors of QoL omitting the role of coping, arguably in light of the mixed empirical support for coping as a mediating factor. These studies vary but all have found direct relationships between cognitive representations and QoL outcome in the direction indicated by Hagger and Orbell (2003). For example Timmers, Kessel, Avshovich, Bamberger, Sabo, Nusem and Panasoff (2007) in their study of 133 dialysis patients found that even though socio-demographic variables explained between 9-23% of the variance in most components of the SF-36, illness perceptions explained between 17-51% of this variance. In a second example Spain et al. (2007) in their study of 580 patients with multiple sclerosis found illness perceptions (with fatigue, pain, anxiety and depression) explained 22% variance in SF-36 physical QoL and 56% in SF-36 mental QoL outcomes. In longitudinal examples Stafford, Berk and Jackson (2009) examined relationships between perceptions and QoL in 193 individuals with coronary artery disease at baseline, 3 and 9 months

follow-up. They found that although age was a better predictor, at time 1 and 2 (i.e. T1 and T2) positive illness perceptions contributed to 16% (low beliefs in negative consequences, low illness identity) and 11% (lesser chronicity beliefs, greater belief in treatment control) of the variance in better self-reported physical QoL but not changes at 9 month follow-up. Further behind neuroticism and smoking at T1 and T2 illness perceptions explained a modest 4% (low identity, high personal control, $p < .01$) and 6.0% (low identity, $p < .01$) respectively in positive mental QoL and 4% at 9 months ($p < .02$). Similarly but with greater contributions of illness perceptions as predictors of outcome Chaboyer et al (2010) examined predictors of QoL at baseline, 3 and 6 months in 114 individuals with injury. With patient characteristics failing to predict outcome, 6 month physical QoL was predicted by 3 month physical QoL and the identity and timeline perception (75·1%). Six-month mental QoL was predicted by the same perceptions plus emotional representations and 3 month mental QoL (72·4%). It is difficult to draw conclusions from such few studies but there appears to be preliminary evidence to suggest that baseline cognitive representations may be initially predictive of QoL but should be interpreted with caution when used to predict QoL over time and further the QoL instrument used needs consideration.

2.3.2: Illness Perceptions and Psychological Distress

As reviewed in-depth in Chapter 1 psychological distress as anxiety and depression is a common co-morbid part of the chronic illness experience, and strong evidence supports that negative illness representations are strong and significant predictors of both co-morbidities on poorer QoL (Dempster, McCorry, Brennan, Donnelly, Murray and Johnson, 2012; Telles-Correia, Barbosa, Mega, Monteiro, 2012; McCabe and Barnason 2012; Chilcot, Wellsted and Farrington, 2011; Dorian, Dempster and Adair 2009; Fu, Bunmdy and Sadiq 2011; Griva, Davenport, Harrison and Newman 2010; Stafford et al. 2009; Knibb and Horton, 2008; Liewellyn et al. 2007a, b; Hermele, Olivo, Namerow and Oz, 2007; Rutter and Rutter, 2002), however the role of coping as a mediator has been inconsistent.

In a first example Rutter and Rutter (2002) found that illness perceptions and coping behaviour explained 41% of the variance in anxiety where serious consequences directly predicted anxiety but also

partially mediated by the COPE's behavioural disengagement scale. Behavioural disengagement also completely mediated the relationship between weak control perceptions and depression and further consequences were directly (and partially mediated) through behavioural disengagement and restraint coping on depression. In a second example Knibb and Horton (2008) in their study of 156 allergy suffers found that illness perceptions (i.e. a strong illness identity and emotional representations) and maladaptive coping (e.g. venting emotions) explained 6- 26% and 12- 25% of the variance respectively on higher levels of psychological distress. Further strong personal control perceptions and adaptive coping strategies (e.g. positive reinterpretation and growth) predicted less distress and coping did partially (but not completely) mediate the above-mentioned perceptions, hence they also directly predicted distress. In contrast Dempster et al. (2012) also using the HADS but a disease-specific coping instrument found that perceptions explained 22% and 23% of the variance in oesophageal cancer related anxiety and depression respectively as to 12% and 7% respectively for coping. As coping did not significantly contribute in final models it was deemed an insignificant mediator. Dorian et al. (2009) similarly found weak relationships for cognitions and coping and no mediation in irritable bowel disease and McCabe and Barnason (2011) concluded in their study of 207 patients with atrial fibrillation that illness perceptions were more important than coping in predicting outcome mirroring studies that have focused on direct relationships, (Chilcot, Wellsted and Farrington, 2011; Fu, Bunmdy and Sadiq, 2011; Griva et al. 2010; Hemele, Olivo, Namerow and Oz, 2007).

In longitudinal examples of cognitive representations on psychological distress over time the findings have also been inconsistent. For example as for QoL Llewellyn et al. (2007b) found that even though high chronicity perceptions (28.0%) and self-blame (21.0%), low satisfaction with information and high acceptance at baseline predicted depression at 6-8 months (67%; but not anxiety) no mediation was found, Stafford et al. (2009) found that perceptions of serious consequences of coronary artery disease significantly predicted higher levels of depression at 3 and 9 months. It appears that like QoL baseline cognitive representations may be initially predictive of QoL but may not always be indicate of

representations overtime. Even though some effects maybe disease-specific it appears that further research is warranted to determine why this is the case. It also suggests that interventions based on the CSM may need to measure representations over time and not rely on baseline reports.

2.4: Cognitive Representations and Coping in Dermatological Disorders

2.4.1: Cognitive Representations in Dermatological Disorders

This chapter so far has departed from the previous chapter on CU to review a new theoretical framework in which to explain some of the variance in significant CU outcomes and possibly intervene to change them. As highlighted in the preface the CSM is particularly suitable for studying CU as unlike many illnesses studied in medicine and health psychology, skin disorders are visible to the naked eye. More specifically individuals with skin disorder have to cope with cultural and social factors associated with skins appearance (e.g. stereotypes, stigmatisation) as well as specific disease and treatment factors (e.g. severity, treatment type), personality characteristics/ core beliefs about the disorder (e.g. alexithymia, attachment style, beliefs about condition) that impact adjustment and whether on-going support/ acceptance is available verses social rejection (Thompson, 2005). What is evident from chapter 1 (p11) is that individuals with CU share some of those traits, states and beliefs that have been implicated in the origin/ maintenance of skin disorder (e.g. alexithymia, perceived unmet treatment needs, core beliefs about CU and feelings of distress from CU. For this reason the model can account for the social-cultural influences that maybe pertinent as to how one might perceive their skin disorder while accounting for symptom perceptions and realities which are often poorly understood by patients with CU and experts alike (Maurer et al. 2009) and hence setting up the development of schematic illness stimuli that CSM predicts will inform cognitive representations. The findings of cognitive representation studies of pruritic dermatological disorders (Cartwright, Endean and Porter, 2009; Fortune et al. 2002, 2004; Fortune et al. 1998; Schaloo et al. 2000; Wittkoski, Richards, Griffiths and Main, 2007) has reflected CSM study findings reviewed earlier including iIllness perceptions being better predictors of outcome over coping and patient characteristics (28-50%, 2-13.0% and 3.50- 5.0% respectively; e.g. Cartwright et al. 2009; Fortune et al.

2002). These findings support that illness representations in skin disorder is similar to non-dermatological conditions and suggests that individuals with CU who share similar symptoms and effects may also hold them in this way.

Such a proposition may suggest that if this is so exploring cognitive representations of CU in a PhD thesis is redundant as one could learn from what has already been done and consistently found in previous research, however as described in further detail in chapter 1 CU is different to many pruritic skin disorders due to its highly fluctuating and unpredictable presentation (Weller, Church, Kalogeromitros et al. 2011; Zuberbier et al. 2009a) and further medications for any particular patient can change often to fit its existing presentation Zuberbier et al. 2009a). How patients with CU plan for the present and future based on its unpredictability is often a concern, as experts themselves have no solid epidemiological understanding of prognosis (Maurer, Weller, Bindslev-Jensen, Gimenez-Arnau, Bousquet, Canonica, et al. 2011). Such complexities have lead dermatologists to notoriously name CU as a complete enigma compared to other skin disorders (Zuberbier, Grattan and Maurer, 2009) and it is common for health professionals to view patients with CU as 'difficult to satisfy and hard to guide' (Weller, Viehmann, Brautigam, Krause, Siebenhaar, Zuberbier and Maurer, 2012). Such perspectives of interacting with those experiencing CU may impact upon the patients perceptions of how their condition is viewed (*social messages*) and misdiagnoses may impact on the patient's symptom perception in terms of what they think they are experiencing that together may inform the development of their cognitive representation of illness. Overall in testing the common-sense model perceptions of identity, cause, timeline and cure/control may differ depending on how CU is presenting at any particular moment in time per patient and may show more within group variance amongst patients compared to those with psoriasis and atopic dermatitis. If cognitive representations are significantly related to CU outcome as the CSM predicts it may prove useful for experts communicating with and treating these patients in regards to asking questions about perceptions in consultations leading to interventions that challenge misperceptions, filling in gaps in knowledge and creating action plans that lead to better patient self-regulation and management.

2.4.2: Evidence for Illness Perceptions and Coping in CU

Indeed cognitive representations in CU and its relationship to outcome has yet to be formally studied, however there is anecdotal evidence in the literature that suggests that individuals with CU do hold such perceptions. In the following examples the representation that the study reflects is italicised in brackets. O'Donnell et al. (1997) in their study of 146 patients found that most associated CU with itching, swelling, pain, fatigue and sleep problems (*identity)* and 46.0% and 42.0% respectively reported that they were worried that their CU would worsen over time (*timeline-acute/ chronic*) and were concerned about its unpredictable nature (*cyclical timeline*). O'Donnell et al. (1997) also found that 25.0% were afraid that their CU was caused by a more serious disease (*cause*). In other study examples Berrino et al. (2006) and Ozkan et al. (2007) reported that 30% and 81% of their participants respectively believed that their CU was caused by psychological factors. Further Ozkan et al. (2007) found that 78.0% of 84 participants reported their CU to have *consequences* regarding a disturbed body image, attitude towards others, attractiveness, feeling different, self-conscious and embarrassed. Additionally 71.0% of these patients believed that they were insufficiently informed about CU and this poor understanding of CU (*illness coherence*) reflected Maurer et al. (2009b) survey where 989 individuals with CU reported waiting until symptoms began before taking medications. One commonality across studies is the high emotional distress that CU elicits and the insufficient emotional support from doctors (Maurer et al. 2009b). Further Maurer et al. (2009b) found that even though 40-60.0% of patients were reluctant to take CU medicines (*concerns*), 45.0% of those did take them (*necessity*). These studies further support in CU additional factors implicated in the origin/ maintenance of skin disorders (Thompson, 2005) reviewed earlier including holding appearance schemas & self-discrepancies (Ozkan et al. 2007) and beliefs about one's condition.

Little is also known regarding coping behaviour in CU as this is a new line of empirical enquiry but an internet based study-specific questionnaire survey of 321 randomly selected participants with CU by Maurer et al (2009) reported that 25.0% believed that CU was a sign of personal weakness suggesting

possibly an inability to *cope.* Further Yang et al. (2005) found that the use of positive coping strategies in CU was associated with a decreased frequency of CU severity and served as a preventative factor, however a more recent study by Chung et al. (2010b) using the Ways of Coping Checklist provided a more in-depth picture of coping behaviour in CU. They found that individuals with CU used both problem and emotion-focused coping. The most common strategy was seeking social support to find more information (75%) and to discuss feelings (69%). In terms of the escape-avoidance and distancing coping strategies most wished CU to go away (81%), turned to eating, drinking and/ or smoking (53%), wished for a miracle (46%), tried not think about it (73%) or tried not to take it too seriously (71%). Self-control strategies involved keeping feelings to oneself (64%) and not letting others know how bad the condition was (62%) and for planful problem solving these involved concentrating on procedures for self-management (68%) and coming up with solution to CU (66%). How these reported beliefs about illness and emotional responses relate to each other and how they may affect CU-related QoL and psychological distress is currently unknown, as this has not been systematically explored. With patient characteristics explaining little variance in outcomes, this thesis hypothesises that the CSM may provide a more systematic way of establishing such relationships. Establishing such relationships has implications for developing and implementing CSM related interventions designed to change perceptions of CU and result in behaviour change.

2.5: Changing Illness Perceptions: Self-Regulation Interventions

2.5.1: Designing and Implementing Behaviour Change Interventions

Good interventions are said to be best built upon empirically supported theoretical frameworks (Medical Research Council, 2002, 2010), as theoretically informed interventions allow for important model determinants to be systematically mapped onto model mediators and outcomes to establish possible mechanisms of behaviour change (Mitchie and Abraham, 2004; Michie, Johnson, Francis, Hardeman and Eccles, 2008). Despite the CSM literature fulfilling this criterion especially with its' empirically supported specific contents of its well-defined determinants (see section 2.2.3) and instruments to

measure them few researchers and applied psychologists have applied CSM findings to interventions (McAndrew, Musumeci-Szabo, Mora, Vileikyte, Burns, Halm et al. 2008).

Translating CSM Findings to Interventions

The discrepancy in timeline between published studies testing relationships between CSM components and outcome (1990's, Hagger and Orbell, 2003) and undertaking applied CSM interventions (early 2000's; Petrie, Cameron, Ellis, Buick, Weinman et al. 2002) might be explained by researchers and practitioners experiencing difficulties in translating findings from the model to practical interventions (McAndrew, Musumeci-Szabo, Mora, Vileikyte, Burns, Halm Leventhal and Leventhal, 2008). Prior to the 2000's there were few formal published guidelines on how to develop, implement, evaluate and report interventions such as those found in behavioural medicine and health psychology which usually consist of multiple cognitive and behavioural components (Craig, Dieppe, Macintyre, Michie, Nazareth and Petticrew, 2012). Original MRC guidelines by Campbell et al. (2000) state that the following five processes of increasing evidence should govern a well-developed intervention:

- **Theory:** Be underpinned by a relevant theory to explore intervention hypotheses
- **Modelling:** Have model components identified that may act as underlying mechanisms to influencing outcomes.
- **Exploratory trial:** Have undergone a pilot study testing the impact of changing the identified process variable components on outcome that is replicable from a developed protocol.
- **Definitive RCT**: A full intervention has been undertaken with the appropriate statistical power
- **Long-term implementation**: Ability to be replicated over time by others has been determined.

Despite these guidelines attempts to replicate studies were often hindered, as researchers of published studies were inconsistent in what aspects of interventions they were reporting. To avert this, the CONSORT statement (Consolidation Standards of Reporting Trials; Moher, Schultz, Altman, CONSORT Group, 2001; Altman, Moher and Schulz, 2012) was introduced as guidelines for writing up and reporting research to be used in conjunction with MRC guidelines. This statement was first introduced in the mid-

1990's by Altman et al. (2012) but this was aimed at medical researchers. In light of this Davidson, Goldstein, Kaplan, Kaufmann, Knatterund, Orleans, et al. (2003) published additional guidelines for researchers of behavioural interventions which consisted of reporting the following elements: contents and elements; the characteristics of those delivering intervention and its recipients; the setting; mode of delivery (e.g. one-to-one, group); intensity (e.g. contact time); duration (sessions over a period) and adherence to delivery protocols.

Davidson et al. (2003) was a step further to guiding researchers to improving the quality of behavioural interventions but Mitchie and colleagues (Craig et al. 2012) observed that although many of these published studies reported such characteristics the contents and elements part were often poorly developed. They found that interventions often consisted of an array of behaviour change techniques (BCTs) but it was difficult to know how or why they were chosen or what mechanisms of the determinant they were targeting to improve outcome. Further many studies claiming to use a theoretical framework were more "theoretically inspired" then informed meaning that model determinants were not empirically tested to establish if they were initially related to the outcome in the given target population (Mitchie et al. 2004, 2008). Critically even when interventions were well designed and implemented researchers often used different terminology to name the same BCTs across studies and what a particular BCT actually consisted of was often omitted meaning that others trying to replicate them possibly missed conducting important procedures that are critical to the study being evaluated as efficacious. This lack of standardisation meant that systematic reviews, which attempted to systematically summarise BCTs, used their own classification systems and therefore differences occurred between reviews. Altogether it was difficult to decipher which singular or combinations of BCTs were more efficacious at changing particular behavioural determinants.

Mitchie et al. (2008) attempted to resolve these issues by conducting a major study that used BCT findings of these reviews and other identified sources (e.g. textbooks, intervention manuals) to

create an expert consensus list of standardised definitions and descriptions of BCTs and map them onto the determinant components of theories of human behaviour and behaviour change. Twenty-six BCT's were identified independently by two psychologists using a 5 page coding system to judge the presence or absence of a technique in intervention descriptions and manuals and applied to the 3 reviews where the agreement rate was 93.0% between judges (0.79 kappa per technique). Definitions and descriptions were used to identify techniques being used in the healthy eating and physical activity intervention research literature by two psychologists to test the reliability of the reliability with a % agreement rate. The individual 26 BCTs identified reflected different theoretical frameworks including the TPB, TRA and SCT. Cognitive determinants and mediators of the CSM are not directly mapped to particular techniques by Abraham and Mitchie (2008) but they did map BCTs for Carver and Schiere's self-regulation theory (Carver and Scihere, 1998) which as mentioned earlier is a generic and content free version of the illness specific common-sense model (Leventhal, Meyer, Nerenz, 2003), hence BCTs for the former would be relevant to the later. The BCTs related to self-regulation theories included (1) prompting specific goal setting and (2) reviews of behavioural goals, (3) providing self-monitoring of behaviours and (4) providing feedback on behaviour and are defined in Table 2.2 below.

Table 2.2: Self-Regulation Behaviour Change Techniques

Behaviour change technique	Definition
Prompt specific goal setting	Involves detailed planning of what the person will do, including a definition of behaviour, specifying frequency, intensity or duration and specification of at least one context, that is where, when, how or with whom.
Prompt review of behavioural goals	Review and/ or reconsideration of previously set goals or intentions
Provide self-monitoring of behaviour	The person is asked to keep a record of specified behaviour(s) (e.g. in a diary)
Provide feedback on performance	Providing data about recorded behaviour or evaluation performance in relation to a set standard of others performance (i.e. receiving feedback on behaviour).

*Adapted from Abraham and Mitchie (2008)

2.5.2: Designing and Implementing CSM Interventions

Behaviour change techniques (BCTs) recommended by Abraham and Mitchie (2008) fit well into the nature of self-regulation theory in that the individual is seen as part of an active problem solving

system attempting to regulate the self by applying meaningful goals and achieving them through directed behaviours that remove barriers to those goals (Scheier and Carver, 2003), however undertaking such BCT's as described in Table 2.2 only addresses the behavioural aspect of the CSM (i.e. bottom-up processes which use concrete/ behavioural strategies). According to CSM intervention development guidelines this approach serves well for illnesses such as diabetes where the focus maybe on behaviour to create an overall understanding of diabetes as a condition that needs consistent self-regulation with the use of objective instruments (e.g. blood sugar monitors), however as described in Section 3.1, the specific contents of CSMs determinants (i.e. identity, cause, timeline, consequences, control and emotions responses) which are said to guide coping actions/ behaviours are well defined so targeting the mechanisms of patient's cognitive processes might also be fundamental in other illnesses. Unlike conventional educational approaches this top-down approach uses abstract/ cognitive strategies (i.e. the patient's own implicit representational model of their illness) as a basis for filling in gaps in knowledge and challenging misconceptions providing them with a conceptual framework for the illness so that they can recognise that it is still chronic even when asymptomatic, hence the new conceptual framework provides the patient with an implicit model to appropriately interpret bottom-up information generated by behaviours (McAndrew et al. 2008). In line with the model incorrect perceptions are tackled at the abstract and experimental level of the representation (i.e. combining abstract-conceptual information of the illness along the dimensions of the representation) with imagery of the disease through pictures/ diagrams to address incorrect visual perceptions of the illness (i.e. as the processing of the patient's representation of illness is also concrete-perceptual with the CSM).

McAndrew et al. (2008) explains that it is the CSM's self-regulatory feedback loop that acts as a dynamic mechanism between cognitions, behaviours and outcome (Figure 2.2, p26) that allows the CSM to be used in either in a top-down or bottom-up way approach when designing interventions (i.e. from the bottom-up (using concrete/ behavioural strategies) or from the top-down (using abstract/ cognitive strategies). McAndrew et al. (2008) clarified that using both approaches is not mutually

exclusive and whether to focus on representations or coping actions (or both), will be dependent on the nature of the illness and the patient. For example focusing on coping actions may be of benefit to conditions that are highly symptomatic where individuals are constantly reacting to concrete perceptual experiences of symptoms. In contrast a focus on representations maybe beneficial to those perceiving that they are asymptomatic because they cannot 'feel' their illness. deRidder, Theunissen and Dulmen (2007) found that when practitioners focused on perceptions patients asked more questions about the illness as compared to coping action plans which generated more questions regarding psychosocial functioning. As behaviour change does not occur in isolation and happens between patients, significant others and health professionals, McAndrew et al. 2008) further stipulated that when embarking on interventions based on the CSM the roles different health professionals will take in managing the chronic illness need to be considered. This is important as it needs to be decided who will be responsible for seeing new warning signs when the patient is no longer engaging in good disease self-management because they are no longer experiencing symptoms and so stop participating in self-regulation. They suggest that a discrepancy between the patient's and professional's perceived level of illness severity risk and actions to be taken (IF-Then rules) need to monitor which will be critical to continued self-management. Importantly intervening would be undertaken from the top-down and bottom-up in a person-centred manner while respecting general guidelines for evidenced based interventions (reviewed earlier).

2.5.3: Empirical Support for CSM Interventions

In the emerging area of CSM interventions to increase patients self-regulation and management there is a growing research evidence base to support that cognitive representations of illness are amenable to change and lead to a range of preferable health outcomes (Petrie, Cameron, Ellis, Buick and Weinman et al. 2002; Fortune, Richards, Griffiths and Main, 2004; Karamanidou, Weinman, and Horne, 2008; Ward, Donovan, Gunnarsdottir, Serlin, Shapiro and Hughes, 2008; Broadbent, Ellis, Thomas, Gamble and Petrie, 2009). As recommended by McAndrew et al. (2008) studies have generally made use of the dynamic self-regulatory features of the model incorporating both top-down and bottom-

up processes with abstract and concrete strategies to improve the patient's understanding of the illness, linking alternative adaptive coping actions to expected outcomes with goal setting and action plan strategies and patient appraisals of coping actions on outcomes. In line with Davidson's guidelines CSM interventions have consisted of psycho-education techniques to change the patient's implicit illness model along the five dimensions of the CSM and have been delivered by psychologists, nurses or a combination of these professionals to a range of patient groups. Most have taken place in either secondary outpatient hospital clinics or university departments where the interest is in behavioural medicine. Further most have been brief consisting of up to three sessions of 30-60 minutes on a one-to-one basis where a generic protocol has been followed but tailored to the patient's individual needs.

In an early example Petrie et al. (2002) examined the effect of an RCT intervention to change perceptions of myocardial infarction (MI) in 65 in-patients. Those in the intervention group undertook sessions consisting of didactic teaching of MI patho-physiology and had their own implicit illness model and self-management behaviours examined in order to change misconceptions and create action plans. They found that intervention participants had a better understanding of MI and modified their perceptions of consequences, timeline and controllability, the latter two being maintained at 3-month follow-up. Further, more intervention patients returned to work than controls at 3-month follow-up. Broadbent et al. (2009) in their replication involving 103 patients were able to mirror Petrie et al. (2002) findings at 3 and 6 months follow-up. In a third example Karamanidou et al (2008) conducted a pilot study psycho-educational intervention to improve haemodialysis patients' understanding of phosphate-binding medication found that those in the intervention group reported better knowledge and showed better outcome efficacy at follow-up. In a different approach Fortune et al. (2004) examined the efficacy of a 6-week patient-preference group intervention to change illness perceptions, coping and outcome in 40 patients with psoriasis, with assessments at pre/ post intervention and 6 month follow-up. Sessions of 2.5 hours duration consisted of didactic teaching of psoriasis physiology and treatment, stress- reduction techniques, cognitive appraisals of maladaptive beliefs about psoriasis and homework based upon

individualized model-centered goals. Compared to controls they reported a reduction in illness identity scores, serious consequences and attributions, less emotional causes, however perceptions of timeline, curability/ control and cause remained similar to the control group as did coping strategies post-intervention and at follow-up possibly reflecting the realities of the condition and the lack of coping activities within the study protocol. An exception is one RCT where no change in perceptions was found (Lavery, O'Neil, Parker, Elborn and Bradley, 2011) however challenging perceptions was not a primary focus of this study. What has remained relatively untested in CSM interventions are tools for emotional regulation even though some have incorporated relaxation and other stress reduction strategies, an omission observed Cameron and Jago (2008) who proposed strategies including a writing self-regulation technique for expressing emotions in women experiencing cancer.

2.5.4: Developing CSM Interventions in CU

How a CU intervention based on the CSM might be developed, implemented and evaluated according to the guidelines reviewed in this section would draw upon reports of previous studies but would also be dependent on three other factors. The first relate to the model fit of CU data to the theoretical framework in question. It would need to be established initially how individuals with CU hold representations of their illness and if they hold them schematically in similar relationships to other chronic illnesses. It would also need to be established if cognitive representations of CU are directly related to the primary outcomes in question (i.e. quality of life and psychological distress) or whether exploratory intervention that mainly focuses on changing perceptions (top-down processing) or action plans (bottom-up processing) but still includes both. The second relate to how services which interact with individuals with CU operate, for example dermatology services presently consist of dermatologists, nurses, immunologists and allergists with no health psychology input meaning whether to promote the benefit of psychologists to CU services or training medical professionals to raise issues regarding illness perceptions and undertaking action plans needs to be considered. The third lies in the coping procedures mediate this relationship as this would have implications for designing an nature of CU itself as a chronic

condition that requires consistent self-regulation and self-management and its complex presentation and pathophysiology which was considered extensively in Section 1.2 and 1.4 (p4 and 11).

2.6: Research Questions

Preliminary

1. What is the impact of CU on overall and bio-psychosocial aspects of quality of life? (*Study 1*)
2. What is the best measure for assessing CU-related quality of life? (*Study 2*)
3. Is the Revised Illness Perception Questionnaire and Beliefs about Medicines Questionnaire a valid and reliable instrument's for measuring cognitive representations of CU? (*Study 3*)

Main

1. What are the cognitive representations of individuals with diagnosed CU? (*Studies 4 and 5*)
2. Do individuals with CU hold cognitive representations of their illness in similar patterns to those experiencing other chronic physical illnesses? (*Studies 4*)
3. As predicted by the Common-Sense Model are cognitive representations of CU significantly related to CU-related outcomes? (*Study 4*)
4. Is the relationship between CU-related cognitive representations and outcome mediated by coping strategies as predicted by the CSM? (*Study 4*)
5. Are CU-related cognitive representations of CU amenable to change via intervention (*Study 6*)
6. Can an intervention to change cognitive representations of CU influence outcome? (*Study 6*)

Chapter 3

Quality of Life in Chronic Urticaria: a Systematic Review (Study 1)

3.0: Rationale for Study

As identified in Chapter 1 the CU-related QoL research literature had grown immensely since 1997 and a collation of this literature had yet to be undertaken. The aim of this study was to undertake a systematic review of quality of life in CU. This was important to create consensus reference points for comparative purposes in the thesis' proceeding studies, determine the impact of socio-demographic and clinical predictors on CU-related QoL compared to CSM predictor variables and what QoL instrument were most valid and reliable.

3.1: Introduction

3.1.1: Quality of Life in Chronic Urticaria

Despite breakthroughs in CU drug treatment up to fifty-percent of patients report symptom management needs that remain unmet by pharmaceutical interventions (Maurer et al. 2010), hence a new primary aim is to improve QoL (Zuberbier et al. 2009b). Assessing QoL in CU is important as it allows for a more complete assessment of illness outcome when conventional measures do not consider psychosocial factors and therefore facilitates more targeted treatment decision making (Van Craneburgh, Prinsen, Sprangers et al. 2012). It also allows CU to be compared to other illnesses on the same criteria when competing for healthcare funding (Finlay, 2005).

Existing reviews on CU-related QoL (Baiardini et al. 2011; Grob and Gaudy-Marqueste, 2006; Weldon, 2006) highlight the scope of the problem but are limited in that they provide conclusions based upon a very limited selection of studies (Baiardini et al. 2011; Maurer et al. 2010). They also do not provide a consensus on the nature of QoL in CU to act as reference points in CU research. This first study of the thesis systematically reviewed the CU-related QoL literature using CRD and Cochrane guidelines (CRD, 2009; Cochrane, 2011). Its objectives are stated below:

3.1.2: Review Question and Objectives

Review Question: What impact does CU have on quality of life?

Review Objectives: To identify and overview the (I) overall impact of CU on quality of life (II) physical, psychological and social aspects of CU-related QoL (III) relationships between patient characteristics and CU-related QoL and (IV) research comparing QoL in CU to reference samples. The final aim was to (IV) critically appraise the methodological quality CU-related quality of life studies.

3.2: Method

3.2.1: Identification of Studies

Search Process and Strategies

Before undertaking the review a scoping exercise was undertaken to confirm that a review had not been disseminated. A search of the Database of Abstracts of Reviews and Effects (DARE); Cochrane Library; Current Controlled Trials and PubMed systematic review database confirmed this. To identify studies assessing QoL in CU a search of published sources relevant to psychology, health, medicine and urticaria were undertaken between January 1997 (year of first study) and 5th October 2012. Searches were limited to studies in English language. The sources searched were as follows:

***Electronic databases and citation indexes*:** Combined MEDLINE, EMBASE, CINAHL and PsyINFO search (Ovid online), Pascal BIOMED, E-Star (British Library); Combined Science Citation Index and Social Science Citation Index (Web of Science) and the Cochrane Library.

By dividing the systematic review question by population and outcome a pilot search of CU and QoL keyword terms was undertaken. What terms to use was decided by exploring Medline's subject indexing database (MeSH) to find standardised terms. Secondly core edited textbooks in urticaria (i.e. Kaplan and Greaves, 2009; Zuberbier et al. 2009) were searched. Thirdly leading expert Consultant Dermatologists in urticaria at St John's Institute of Dermatology, St Thomas Hospital London were consulted to establish if further synonyms existed. The final terms can be found in Table 3.1 (p55). As

the primary aim of the review was to describe quality of life and QoL in relation to patient characteristics, it was predicted that studies would be of either a cross-sectional or cohort (retrospective or prospective) design. These studies are more subjected to bias but are good for assessing disease burden and can be useful for informing decisions regarding patient care, allocation of health resources and preliminary hypothesis testing, however the pilot search also indicated an increasing number of RCT's using QoL measures which are a good source of baseline data and large sample sizes.

Table 3.1: Identified Keyword Synonyms for CU and Quality of Life

Keyword	Synonyms
Urticaria	spontaneous; ordinary; idiopathic autoimmune; recurrent; resistant; persistent
Quality of Life	quality of life; health-related quality of life; subjective health status; health status

A high sensitivity-low precision search was used to identify relevant papers. This approach sacrifices specificity but maximises obtaining all papers. Conventional search filters were avoided as they were highly specified for MEDLINE randomised control trials (the review was not evaluating effectiveness). The search strategy used for the OVID search (titles and abstracts) was as follows:

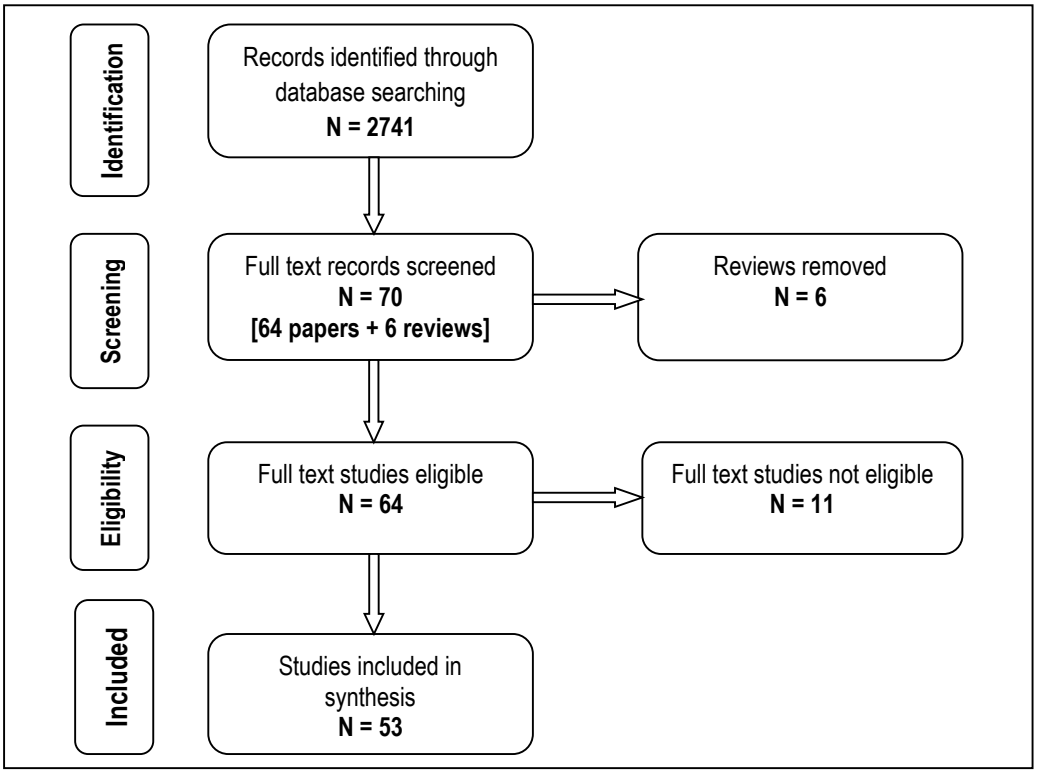
Urticaria AND (spontaneous OR ordinary OR idiopathic OR autoimmune OR recurrent OR resistant OR persistent) AND (quality of life OR health status) Limiters: ENGLISH LANGUAGE AND 1997-2012

3.2.2: Study Selection Criteria

Studies were included if: participants had a primary chronic spontaneous urticaria (CU), idiopathic (CIU) or autoimmune (CAU); were available in English language and used multi-dimensional QoL instruments. Studies were excluded if they assessed: primarily acute or physical urticaria or used child QoL instruments. CU was defined using CU classification guidelines (Zuberbier et al. 2009a). Once potential papers were selected the full-text versions (and their references) were retrieved for further investigation. If the main assessor was uncertain as to what papers should be included, this was discussed to a consensus with a second assessor (authors academic supervisor). If the information necessary to make a decision was insufficient from the paper, its corresponding author was contacted by email for further information and given two weeks to reply. Studies were excluded if requests for

information were not provided. If it appeared that authors had duplicated data across studies, the corresponding author was contacted to confirm this. This data was treated as one the selection process is illustrated in Figure 3.1 below.

Figure 3.1: Flowchart of the Selection Process of CU-Related Quality of Life Studies



The search generated 2741 hits from 8 sources. From the abstracts 64 papers including 6 reviews were retrieved (Weller et al. 2011; Baiardini et al. 2011; Grob and Gaudy-Marqueste, 2006; Welden, 2006; Basra, Fenech, Gatt, et al. 2008; Kini and Delong, 2012). After applying the selection criteria full-texts papers were excluded because they: acknowledged CU and QoL but were not exploring it; no further information could be retrieved; no patients with CU were in the dermatological sample, urticaria patients ofv different types were grouped as one homogenous group. The references of full-texts only retrieved studies already identified. Eleven studies were rejected leaving 53 included papers. Rejected papers can be found in Appendix 1 (pA2).

3.2.3: Data Extraction

Data was extracted from each included study based on general citation information, study

characteristics and participant characteristics as recommended by the Centre of Reviews and Dissemination guidelines (CRD, 2009) plus data required to answer the studies own specific objectives. Data extracted to answer the review objectives included those concerning QoL assessment and analysis: baseline overall QoL, baseline aspects of QoL, relationships between patient characteristics and QoL and comparative data from reference samples. One standardised data extraction sheet was developed to extract data. The extracted elements are stated briely below and are explained in more detail in Appendix 1 with a copy of the data extraction sheet (pA3-4).

Data Extraction

Part 1: General, study and participant characteristics

(a) General information: (b) Study characteristics (c) Participant characteristics:

Part 2: Quality of Life outcome data and results

(a) QoL assessment/ analysis (b) Baseline overall QoL

Part 3: Relationship between patient characteristics and quality of life

(a) Clinical variables (b) Socio-demographic variables (c) Other factors identified

Part 4: reference samples

a) Other skin disorders (b) chronic diseases and c) healthy populations

3.2.4: Quality Assessment

During the data extraction process studies were concurrently assessed for methodological quality. To do this a compound checklist without a scoring system was used as scoring systems have been heavily criticised for being unreliable and not accounting for bias (CRD, 2009; Cochrane, 2011). As the aim was to collate data across studies describing the impact of CU on quality of life it was decided to abandon the conventional hierarchy of evidence used to evaluate studies as this usually applies to the effectiveness of health interventions and does not account for which study designs are best for answering certain types of questions. However, despite studies undergoing a quality assessment none were excluded as the pilot search indicated that there would be a high degree of clinical and methodological heterogeneity across studies in respect to design, objectives, severity and QoL instruments used. This indicated that meta-analysis was unlikely but highlighted the need for an appraisal of research methodology in CU-related QoL research in addition to the qualitative synthesis.

To assess quality an existing standardised checklist by Mols, Vingerhoets, Cobergh and Poll-Franse (2005) to assess the methodological quality of studies reporting QoL in breast cancer survivors was modified to assess QoL studies in CU. The checklist draws upon theoretical and methodological considerations of prognostic cohort studies but was adapted by Mols et al (2005) to incorporate cross-section studies and studies comparing groups. Importantly the checklist was also modified to address studies specifically assessing QoL; hence it assesses common methodological issues that occur in these studies that threaten internal validity (e.g. baseline treatment status, prognostic factors), external validity (description of study samples and selection criteria) and precision (sufficient sample size to detect differences or determinants). These qualities made it very suitable for assessing heterogeneous studies. In line with guidelines (CRD, 2009) the terms *met*, *partially unmet* or *unmet due to lack of reporting* were used. Its items are described briefly below and in more detail in Appendix 1 (pA3).

Quality Assessment

1. Socio-demographic and clinical variables data are described
2. Inclusion and/or exclusion criteria are formulated
3. Process of data collection is described
4. CU treatment described at baseline
5. The results are compared between two groups or more
6. Participation and response rates for groups
7. Patient characteristics of responders/ non-responders presented
8. Valid QoL questionnaire was used
9. Results described for both QoL and physical, psychological and social functioning
10. Mean, standard deviations or percentages are reported for important outcomes
11. Attempt made to find determinants with the highest prognostic value
12. Patient signed an informed consent form
13. Power analysis
14. Quality of reporting

3.3: Results

3.3.1: General Study and Participant Characteristics

The 53 included studies summarised in Table 3.2 (p60) spanned the full study search period starting from O'Donnell et al (1997) and the English language restrictions applied were reflected in the mainly European (31) and North American/ Canadian (9) studies. In light of this restriction studies included those from Asia (India, Japan), one each from Iran and Australia and three included a cross-

continental sample including European, African, Austrialian, Asian and Middle Eastern patient samples (Potter et al. 2008; Yun et al. 2011; Zuberbier et al. 2010). A substantial proportion of studies were cross-sectional (28.30%, n= 15) but near equal numbers were longitudinal studies that consisted of RCT studies (30.19%, n= 16) and pilot/ cohort based trials. The main objectives of cross-sectional studies were to describe the impact of CU on quality of life whereas trials aimed to evaluate the efficacy or safety of drug treatments. No RCT's evaluated psychological interventions. A proportionate number of studies developed and/ or validated QoL questionnaires (16.98%, n = 9). Studies predominantly took place in secondary services (hospital or university dermatology/ allergy departments) but 16.98% (n = 9) occurred in tertiary settings including a private clinic (Godse, 2006). No studies existed in primary care however one used a community Internet survey (Maurer et al. 2009).

The majority of studies (47.17%, n = 25) described patients as chronic idiopathic urticaria (CIU) but similar numbers used chronic urticaria (37.74%, n =20) to either mean the same thing or describe samples including those with CU physical urticaria. Two studies (n = 3.77%) used chronic autoimmune urticaria and more recent studies used the newly recognised chronic spontaneous urticaria (3 studies; Kocaturk et al. 2011a, b; Magerl, 2010). One study used urticaria resistant (Okubo et al. 2011). Further most studies made use of comparison/ reference groups including other urticaria, dermatological disorders, healthy adults and reference samples from the general population.

Baseline Participant Characteristics

Sample sizes across studies ranged from 12 (Kaplan et al. 2008) to 1356 (Grob et al. 2005) and females almost always-outnumbered males (exception Godse et al. 2006; Yadav et al. 2008). The age of participants ranged from 16 (Tondury et al. 2011) to 83 years old (Mylnek et al. 2008) with means ranging from 27 (Buyukozturk et al. 2012; Engin et al. 2008) to 53 years (Baiardini et al. 2005). Disease-severity were assessed in 32 studies and ranged from mild to severe, but instruments varied in their contents and scoring and this lack of standardisation caused difficulties in collating data across studies and in knowing what mild to severe actually meant when comparing across studies.

Table 3.2: Summary of Included Studies

General	Study characteristics		Participant Characteristics	Quality of Life	
First Author/ Country/	**SD: Study Design** **AO: Study Aim/ Objective**	**S: Service/ D:CU Descriptor** **C: Comparison**	**S: Sample Size (All)/ G:Gender/** **A: Age in years (CU only)**	M: Measure MS: Mean I:Importance/ O: Other	**Study and QoL Conclusions**
1. Akashi 2011 Japan	**SD:** Clinical study **AO:** Explore relationships to *helicobacter* & test efficacy of antibacterial treatment	**S:** Secondary/ University Dermatology Department **D:** CU **C:** Prurigo chronic multiformis	**S**: 99 (CU 82, PCM 17) **G:** CU: M 21 F: 61 **A**: CU: 45.3 ± 14.9	**M:** Skindex-16 **MS:** N/A* **I:** Primary **O:** Disease-severity	Only emotional related QoL was significantly better at statistical level as to symptoms & functioning
2. Augustin 2000 Germany	**SD:** Questionnaire validation **AO:** To develop a QoL measure for chronic skin disorder	**S:** Tertiary/ Specialist clinic **D:** CU **C:** Psoriasis (P), Atopic Dermatitis (AD)	**S:** 747 (P: 401, AD: 254, CU: 47) **G:** M: 34%, F: 66 **A**: 41.7 ± 13.0 (18-66)	**M:** FLQA-d, DLQI **MS:** NR **I:** Primary **O:** Other QoL	QoL poorer in AD. FLQA-d is a valid & easy to use measure to evaluate QoL in skin disease
3. Baiardini 2005 Italy	**SD:** Questionnaire validation **AB:** To develop a disease-specific QoL questionnaire for CU	**S:** Setting not identified **D:** CU **C:** No	**S:** Develop (D): 76, Validate (V): 125 **G:** D: M: 29, F: 47, V: M: 46 F: 79 **A:** D: 48.9 ± 7.82 V: 53.69 ± 11.7	**M:** CU-Q_2oL, SF-36 **MS:** NR **I:** Primary **O:** No	CU-Q_2oL is adequate to measure subjective well-being, global evaluation of CU impact & effectiveness of treatment.
4. Baiardini 2003 Italy	**SD:** Cross-Sectional **AO:** To evaluate QoL by subjective health status & satisfaction.	**S:** Allergy Unit **D:** CU **C:** Respiratory Allergy (RA) Healthy subjects	**S:** CU 21, RA: 27, Controls: 608 **G:** M: 5 F: 16 **A:** 46.3 ± 12.4	**M:** SF-36 **MS:** PCS 65.64, Mod MCS 59.39 Mod **I:** Primary **O:** Satisfaction Profile	Health status scores sig. lower in CU than RA for most aspects& all domains to controls. CU sig. impacts on QoL.
5. Baker 2008 USA	**SD:** Clinical study **AO:** To evaluate CIU severity, Basophilhistamine release, use, of oral corticosteroids, work absence & QoL	**S:** University Allergy Dermatology **D:** CIU Basopenic, B, CIU B non-responders, NR CIU B responders,	**S:** 50 (B: 8, NR: 15, R:19) **G:**M: 24%, F: 74% Total sample **A:** 44 ± 16	**M:** Skindex-29 **MS:** NR **I:** Secondary **O:** Disease severity	QoL similar in all CIU subsets. BR subtype had longer disease duration, more emergency department use & sig. more itch.
6. 2011a, b)* UK	**SD**: Cross-sectional **AO**: To study anxiety in CIU & compare to health controls	**S**: Secondary/ University Dermatology Department **D**: CIU **C**: Healthy controls (HC)	**S**: 86 (CIU: 55, HC: 31 **G**: CIU: M: 21.8%, F:78.2, **A**: CIU: 45.25 ± 16.1	M: SF-36 MS: Not reported **I** : Secondary **O**: Hospital & Anxiety Scale	Higher anxiety in CIU verses control. Relationship between anxiety, personality, attachment style, alexithymia & QoL dimensions

**Studies used the same dataset*

Table 3.2 continued

General	Study characteristics		Participant Characteristics	Quality of Life	
First Author/ Country/	**SD: Study Design AO: Study Aim/ Objective**	**S: Service/ D:CU Descriptor C:Comparison**	**S: Sample Size (All)/ G:Gender/ A: Age in years (CU only)**	**M: Measure MS: Mean I: Importance O: Other**	**Study and QoL Conclusion**
7. Berrino (2006) Italy	**SD**: Cross-sectional **AO**: To evaluate depression, QoL, life events, motivation for psychological therapy	**S**: Setting not stated **D**: CU **C**: No	**S**: 30 **G**: M: 5, F: 25 **A**: 44 Range 21-40	**M**: DLQI, NHP **MS**: Moderate **I**: Primary **O**: BDI	Most CU patients experienced a stressor event 6mths prior to onset/ Depression in CU higher than general population.
8. Brzoza (2011) Poland	**SD**: Questionnaire Development **AO**: To develop and validate a Polish version of the CUQ-oL & present initial results in a Polish sample.	**S**: University Allergy & Immunology Department **D**: CU **C**: None	**S**:126 **G**: M: 37 (29.4%), F: 89 (70.6%) **A**: 45.4 ± 14.1	**M**: CU-Q2oL, DLQI, Skindex29 **MS**: DLQI 9.02±6.96 mild Skindex 29 mild/mod **I**: Primary **O**: AS	Itching/ embarrassment most impaired & eating/ limits least. CU impairs QoL. Polish version is reliable, valid, responsive & easy to use in research & practice
9.Bunselmeyer (2009) Germany	**SD**: Pilot, pre-post test **AO**:To test a food challenge procedure through a pseudo-allergen-free diet	**S**: Dermatology Department Inpatients & Outpatients **D**: CU **C**: None	**S**:153 **G**: M: 52 (33%), F: 101 (67%) **A**: M: 43 (13-68), F: 39.5 (10-76)	**M**: CU-Q2oL **MS**: 55.19 Mod **I**: Primary **O**: Symptom disturbance	17% had remission, 51% partial remission & 32% no remission but all reported <impairment, urticaria symptoms & better QoL.
10.Buyukozturk (2012) Turkey (Istanbul)	**SD**: Uncontrolled trial **AO**: To test the omalizumab in resistant CU on activity and QoL over time	**S**: Secondary/ Allergy Department **D**: CSU **C**: None	**S**: 14 12 CSU, 2 Idiopathic angioedema total sample **G**: F: 10 M: 4 **A**: 43.07 (27-57)	**M**: CU-Q2oL **MS**: 57.5 ± 13.8 Mod **I**: Primary **O**: Disease-severity-UAS	Omalizumab improved QoL and reduced urticaria activity from baseline to 6months.
11. Dastghelb (2011) Iran	**SD**: Pilot study **AO**: To test the effectiveness of Masalazine as therapeutic option for CIU	**S**: Secondary/ University Dermatology Outpatient **D**: CIU **C**: None	**S**: 33 **G**: M: 12 (36.4%) F: 21 (63.6%) **A**: 32.8 ± 9.4	**M**: DLQI **MS**: 9.5 ± 4.2 Mild **I**: Primary **O**: Disease severity	Mesalazine sig. decreased DLQI scores in 66% of participants & symptoms scores in at least half
12. Dias (2011) Italy	**SD**: Questionnaire validation **AO**: To cross-culturally adapt & validate a Brazilian-Portuguese CU-Q2oL	**S**: University Hospital Dermatology **D**: Chronic Urticaria **C**: Physical urticaria only	**S**: 112 (27 physical urticaria only) **G**: M: 96 (86%), F: 16 (14%) **A**: 46 ± 14.28	**M**: CU-QoL, DLQI **MS**: CU-QoL: 36±22 Mod DLQI:6.25±6.53 Mild **I**: Primary **O**: Severity	Brazilian-Portuguese version is acceptable to patients, valid & reliable to evaluate treatment outcomes & clinical research

Table 3.2 Continued

1: General	2: Study Characteristics		3: Participant Characteristics	4: Quality of Life	
First Author/ Country/	**Study Design (SD) Study Aim/ Objective (AO)**	**S: Service/ D: CU Descriptor C: Comparison**	**S: Sample Size (All)/ G:Gender/ A: Age in years (CU only)**	**M: Measure MS: Mean I: Importance/ O: Other**	**Study and QoL Conclusion**
13. Engin (2008) Turkey	**SD**: Cross-sectional **AO**: To determine levels of anxiety, depression & QoL	**S**: Urticaria Clinic **D**: CIU **C**: Healthy controls	**S**: 107 (CIU 73, Control 34) **G**: CIU: M: 30, F: 43, C: M: 14 F: 20 **A**: CIU: 2 7 ± 10.8, C: 36.1 ± 10.3	**M**: WHO QoL-BREF **M**S: No mean score **I**: Primary **O**: BDI* & BAI**	QoL reduced. Patients with CIU suffer depression & anxiety that sig. decreased QoL.
14. Gimenez-Arnau (2007) Italy Argentina,Europe Romania, Poland	**SD**: RCT **AO**: Assess efficacy & safety of rupadine 10 & 20mg on symptoms, treatment, QoL	**S**: Dermatology Centres **D**: CIU **C**: CIU placebo	**S:** 98 **G:** M: P: 42, 10mg: 30, 20mg: 26 **F** P: 69.0, 10mg: 77.0, 20mg: 79.0 **A:** P: 35.8, 10mg: 40.2, 20mg: 37.6	**M**: DLQI **MS**: Not reported **I:** Secondary **O**: Disease severity	As reflected in DLQI scores, 10mg Rupadine improves QoL at baseline, 2, 4 & 6
15.Godse (2006) India	**SD**: Cross-sectional **AO**: To evaluate QoL in patients with CU in India	**S**: Private skin clinic **D**: CU **C**: No	**S**: 50 **G**: M: 33 (66%), F: 17 **A**: Mean 43, Range 18-80	**M:** DLQI **MS**: 7.16 Mild **I**: Primary **O**: None	CU had mild impact on QoL in > 75% of patients. Patients with DPU & positive ASST reported sig. worse QoL.
16.Grob (2009) France	**SD**: RCT **AO**: To seeif Desloratadine Daily 5mg is better than PRN to improve QoL	**S**: 35 Dermatology Centres **D**: CIU **C**: CIU placebo	**S**: 129 ITT (Daily: 46 PRN: 60) **G**: M: 38, F: 68 Total sample **A**: 43.0 ± 13.6 Total sample	**M**: DLQI, V-Dermato **MS**: 6.1±4.5 & 5.1±4.5 Mild **I**: Primary **O**: Rescue drugs, PRN	Ccontinuous 5mg daily desloratadine better than desloratadine as PRN over time in preserving QoL
17. Grob (2005) France	**SD**: Cross-sectional **AO**: To determine which QoL aspects are mainly impaired. To compare across skin diseases	**S**: Dermatology clinic **D**: CU **C**: Atopic Dermatitis (AD) Psoriasis (PS)	**S**: 1356 (CU 466, PS 464, AD 426) **G**: CU: M 130, F 237, **A**: CU 37 ± 11	**M**: V-Dermato **MS**: No global score **I**: Primary **O**: Patient pruritus rating of legions on VAS	QoL impaired in all conditions but are qualitatively different across conditions. Impact of CU has been underestimated
18. Grob (2008) France	**SD**: RCT **AO**: To evaluate the effects of desloratadine 5mg & placebo on QoL scores To assess tolerability	**S**: 40 Dermatology centres **D**: CIU **C**: CIU placebo (P)	**S:** 137 (CIU 65 P: (P) 72) **G:** CIU: M: 24 F: 41, P: M: 29 F: 43 **A**: CIU: 41.2 ± 15.4 P: 41.5 ± 15.2	**M**: DLQI (DI) V-Dermato (V) **MS**: DI D: 9.7±5.9, P 8.8±5.2 V:D:35.2 ± 18.8 P: 35 ± 20.2 Mild-mod **I:** Primary **O**: Sleep, daily activities	Desloratadine 5mg sig. Related to improvements from baseline to day 42 in both QoL measures. Drug reduces QoL score & is a useful outcome measure.

Table 3.2 Continued

1: General	2: Study Characteristics		3: Participant Characteristics	4: Quality of Life	
First Author/ Country	**SD: Study Design AO: Study Aim/ Objective**	**S: Service/ D: CU Descriptor C: Comparison**	**S: Sample Size (All)/ G:Gender/ A: Age in years (CU only)**	**M: Measure MS: Mean I: Importance/ O: Other**	**Overall QoL Impact Study and QoL outcome**
19. Jariwala (2009) USA	**SD:** Questionnaire Validation **AO:** To develop a CU specific Questionnaire: Urticaria Severity Score (USS)	**S:** Out-patient Clinic **D:** CU **C:** None	**S:** 80 **G:** M: 21 F : 59 **A:** 42.8±16.2	**M:** DLQI **MS:** Mild **I:** Primary **O:** Urticaria severity	The USS is valid & reliable for monitoring urticaria severity and maybe more applicable than the DLQI
20. Kaplan (2008) USA	**SD:** Clinical Study **AO:** To investigate the efficacy of omalizumab in patients with CAU	**S:** University Dermatology **D:** CAU **C:** CAU placebo	**S:** 12 **G:** M: 4 F: 8 **A:** 32-62 (range)	**M:** DLQI **MS:** 14, Mod **I:** Secondary **O:** Sleep & daily activities	Omalizymab is effective in CAUr as indicated by DLQI
21. Kapp & Picher (2006) Switzerland/ Germany	**SD:** RCT **AO:** To assess efficacy of Levocetrizine 5mg, QoL & productivity in CIU	**S:** Dermatology centres **D:** CIU **C:** CIU placebo	**S:** 124 (CIU: 81 Placebo (P) 85) **G:** M: CIU 23 P 25, F: CIU 58 P 60 **A:** CIU: 44.3, Placebo: 39.7	**M:** DLQI **MS:** CIU: 11, P: 12 Mod **I:** Secondary **O:** Pruritus severity & features	Drug reduced disease severity & improved QoL & productivity in patients from baseline to 4 weeks
22. Kocaturk (2011a,b) Istanbul, Turkey	**SD**: RCT **AO**: To assess the efficacy of autologous whole blood serum (AMB) autologous serum (AS) injections	**S**: Dermatology department research hospital **D**: Spontaneous CU **C**: Placebo control	**S**: 88 **G**:ASST+: M: 24 (40.7%), F: 35 (59.3) ASST-: M: 35 (59.3%), F: 23 (79.3) **A**: +: 39.36 ±11.95 & -: 39.07± 14.13	**M**: DLQI **MS**: A+ 11.10 ± 5.89 Mod A- 10.07 ± 5.83 Mod **I**: Primary **O**: See disease-severity	Even though not sig. better than placebo therapy resulted in a marked decrease in scores of disease activity & DLQI.
23. Lachapelle (2006) Belgium	**SD**: RCT **AO**: To assess the effect of 5mg desloradine once Daily	**S:** 24 Dermatology centres **D**: CIU **C**: None	**S**: 121 **G**: M: 40% F: 60% **A**: 41.1 ± 15.7	**M**: DLQI **MS**: 13.4 ± 5.2 Mod **I**: Primary **O**: Sleep & daily activities	QoL improved at day 7 and 42. QOL scores correlate with pruritus hive size. Desloradine improves QOL as measured by the DLQI
24. Lennox & Leahy (2004) USA	**SD**: Questionnaire development **AO**: To test the validity of DLQI in two CIU samples treated with fexofenadine	**S**: Not identified **D**: CIU **C**: No	**S**: 857 (418 and 439) Gender and age not stated in paper	**M**: DLQI **MS**: 9.66- 9.83 Mild **I:** Primary **O**: Disease severity	One dimensional structure & lack of random error in CU. Distinguished between levels of impairment & is valid &reliable.

Table 3.2 Continued

1: General	2: Study Characteristics		3: Participant Characteristics	4: Quality of Life	
First Author/ Country	**SD: Study Design AO: Study Aim/ Objective**	**S: Service/ D: CU Descriptor C: Comparison**	**S: Sample Size (All)/ G:Gender/ A: Age in years (CU only)**	**M: Measure MS: Mean I: Importance/ O: Other**	**Overall QoL Impact Study and QoL outcome**
25. Liu (2012) China	**SD**: Questionnaire validation **AO**: To study QoL in Chinese patients with CU & DLQI psychometric properties	**S**: Cross-sectional Questionnaire Validation **D**: CU **C**: None	**S**: 131 **G**: F: 83, M: 48 **A**: 32.94 ± 0.70	**M**: DLQI **MS**: 9.93 ± 0.46 Mod **I**: Primary **O**: None	DLQI had two latent factors & a Cronbach alpha of .85. CU has a moderate impact on life quality.
26. Magerl (2010) Germany	**SD**: Prospective trial **AO**: To assess the effects of a pseudo allergen-free diet on disease severity & QoL	**S:** Tertiary/Specialist Urticaria Clinic **D**: Spontaneous CU **C:** None	**S:** 140 **G:** Females sig outnumber males **A:** 18- 70+ range	**M:** DLQI **MS**: NR **I**: Secondary **O**: None	20 subjects strongly responded to diet & 19 partially responded. 9 subjects made reductions in medication. Diet is beneficial in 1/ 3 patients
27. Mathias (2010) USA	**SD**: Validation **AO**: To qualitatively identify outcomes important to patients, to assess content validity of a patient diary based on UAS	**S:** University Dermatology **D**: CIU **C**: None	**S**: 31 (baseline, stage 1) **G**: F: 26 (84%), M: 5 (16%) **A**: 46.0 ± 16.1	**M**: DLQI **MS**: Not reported **I**: Primary **O**: Sleep, activity, symptoms, Management	The urticaria patient diary is an easy to administer & comprehensive assessment tool of CIU symptoms.
28. Maurer (2009) France/ Germany	**SD**: Cross-sectional AO: To investigate QoL, treatment usage & doctor-patient relationship	**S**: Internet Survey **D**: CU **C**: None	**S**: 321 (Germany 169, France 150) **G**: M: 134 (41.9%) F 186 (58.1%) **A**: Total: SD 37	**M**: Skindex-29 **MS**: No global score **I:** Primary **O:** Treatment use, doctor-patient relationship	CU has substantial impact on QoL. Physicians who discuss emotional impact increase trust & satisfaction in their patients.
29. Mylnek (2009) Germany	**D**: Questionnaire development **AO**: To develop a German version of CU-Q2oL	**S:** University Dermatology **D**: CU **C**: No	**S**: 157 **G**: Twice as many females as males **A**: Range 31–75 yrs	**M:** CU-Q2oL, Skindex-29, DLQI **MS**: DLQI 6.8 Mild **I**: Primary **O**: See severity	Six scales identified. Is a reliable measure to assess burden of CU on QoL in research.

Table 3.2 Continued

1: General	2: Study Characteristics		3: Participant Characteristics	4: Quality of Life	
First Author/ Country	**SD: Study Design AO: Study Aim/ Objective**	**S: Service/ D: CU Descriptor C: Comparison**	**S: Sample Size (All)/ G:Gender/ A: Age in years (CU only)**	**M: Measure MS: Mean I: Importance/ O: Other**	**Overall QoL Impact Study and QoL outcome**
30. Mlynek (2008) Germany	**SD**: Cross-section **AO**: To determine correlations between the UAS & QOL	**S:** Dermatology & Allergy Clinic **D**: CU **C**: None	**S**: 111 **G**: M: 32 F: 79 **A**: 43.7 ± 15.4 (range 18-83)	**M**: DLQI **MS**: 7.97 ± 5.8 Mild **I**: Primary **O**: See severity	UAS positivity correlates with QoL & monitors disease-activity using mean values over 4 days.
31. O'Donnell (1997) England	**SD**: Cross-section **AO**: To assess QoL for the first time in CU	**S**: Tertiary Urticaria Clinic **D**: CU, CU+ Delayed Pressure Urticaria (DPU) **C**: Urticarias, heart disease	**S**: 142 (69 CU, 73 CU with DPU) **G**: M: 45, F: 97 **A**: 39.7 (range 14-71)	**M**: NHP, Study-specific **MS**: No composite **I:** Primary **O:** None	Many aspects of QoL sig. impaired & comparable to heart disease. Worse in patients with CU& DPU
32. Okubo (2011) Japan	**SD**: RCT **AO:**Test double dose cetirizine hydrochloride 10 & 20mg & Olopatadine10mg on QoL	**S**: University dermatology **D**: Urticaria resistant **C**: CU treatment groups	**S**: 51 **G**: M: 16, F: 35 **A:** 39 ± 18.1 (range 17-81)	**M:** Skindex-16 **MS:** 42 Mod **I**: Primary **O:** Disease severity	Doubling dose cetirizine > efficacious. Emotions most effected over symptoms & functioning
33. Ozkan (2007) Istanbal, Turkey	**SD**: Cross-sectional **AO**: To determine prevalence of psychiatric co-morbidity in CIU. To compare QoL in CIU to controls	**S**: University Allergy Department **D:** CIU **C**: Healthy Controls (C)	**S**: 159 (CIU: 84, C: 75) **G**: M: 13, F: 15 **A**: CIU: 36.83 ± 10.26	**M**: SF-36 (0-100) **MS**: PCS: CIU: 58.25,C:75.5 MCS: CIU:56.85, C:73.43 Mod **I**: Primary **O:** None	Psychiatric co-morbidity high in CIU and is detrimental to QoL
34. Poon (1999) England	**SD**: Cross-sectional **AO**: To determine the extent of disability in different urticarial conditions	**S**: Tertiary Urticaria Clinic **D:** CIU **C**: Delayed Pressure Urticaria DPU), Others	**S**: 170 (CIU 47 CIU+ swelling (A) 26) **G**: M: 44% F: 56% **A**: 37.6 ± 10.3	**M**: DLQI **MS**: CIU 25%±24, CIU+A 43%±23* **I:** Primary **O:** None	DPU& cholinergic urticaria have worse QoL than CIU & comparable to other skin disorders.
35. Potter (2008) Europe Romania South Africa	**SD**: RCT **AO:** To compare efficacy of levocetirizine 5mg & desloratadine 5mg daily on symptoms activity & QoL	**S**: Dermatology Centres **D**: CIU **C**: None	**S**: 886 (Lev 438, Des 448) **G**: M: 296 (33.4%) F: 590 (66.6%) **A**: 43.10 ± 15.08 overall	**M:** DLQI **MS**: 11.58±6.31 & 12.16±6.68 **I**: Secondary **O:** Treatment satisfaction	Levocetirizine 5mg sig. more effective than desloratadine 5mg over 4 weeks. Both improve QoL

***Percentage scoring 10 or above**

Table 3.2 Continued

1: General	2: Study Characteristics		3: Participant Characteristics	4: Quality of Life	
First Author/ Country	**SD: Study Design AO: Study Aim/ Objective**	**S: Service/ D: CU Descriptor C: Comparison**	**S: Sample Size (All)/ G:Gender/ A: Age in years (CU only)**	**M: Measure MS: Mean I: Importance/ O: Other**	**Overall QoL Impact Study and QoL outcome**
36. Reeves (2004) Australia	**SD**: RCT **AO**: To evaluate the efficacy of Hydroxychloroquine immunodulation therapy	**S**: Tertiary/ Immunology & Allergy **D**: CAU **C**: CAUplacebo	**S**:18, 9 placebo (P), 9 Hydrox (H) **G**: Stated as 5:1 ratio **A**: 38.2	**M:** SF-12, **MS**: SF-12 P 19.1 P 24.1 Severe **I**: Primary **O:** Disease severity	Improved SF-12 scores with hydroxychloroquine, but poor reporting of measure in study.
37.Seidenar (2006) Italy	**SD**: Non-randomised trial **AO**: To measure effects of Descloratadine(DL) 5mg once daily on QoL	**S**: 28 Investigation sites **D**: CIU **C**: CIU moderate & severe	**S**: 255 **G** M: 87 (34.1%) F: 168 (65.9) **A**: 43.5 (42 median), range 18-79	**M**: DLQI MS: 9.4 ± 5.4 mild **I:** Primary **O**: CU severity, sleep, activities	Descloratadine 5mg improved QoL irrespective of moderate or severe levels of CIU.
38. Shikar (2005) USA/ Canada	**SD**: Questionnaire validation **AO**: To estimate the minimal important difference (MID) of the DLQI in CIU	**S**: Dermatology clinic sites **D**: CIU **C**: None	**S**: 944 (476 and 468) **G**: NR **A**: NR	**M**: DLQI **MS**: 9.64± 6.19 & 9.32± 5.61 Mild **I:** Primary **O:** None	MID of 2.24-3.10 recommended for interpreting DLQI scores in CIU
39. Silvares (2011) Brazil	**SD**: Cross-sectional survey **AO**: To evaluate the impact of QoL on CU out-patients using the DLQI	**S**: University Out-patient Clinic **D**: CU **C**: Other Dermatoses	**S**: 100 **G**: F: 86%, M: 14% **A**: 41.8	**M:**DLQI **MS**: 13.5 Mod **I**: Primary **O**: None	CU seriously compromises QoL of patients evaluated.
40. Spector (2007) USA	**SD:** RCT **AO**: To examine fexofenadine HCL 180mg on QoL, Work productivity& activity	**S**: Dermatology Centres **D**: CIU **C**: CIU control	**S**: 254 (CIU 163, Control 91) **G**: NR **A**: NR	**M**: DLQI **MS**: 11 ± 16.3 Mod **I**: Secondary **O:** WPAI*	Fexofenadine improves HRQoL, work productivity & activity score.
41.Staevska (2010) Germany	**SD**: RCT **AO**: To provide evidence for dosage up to 4-fold H2–antihistamines in CU	**S:** Specialist Urticaria Clinic **D**: CU **C**: CIU treatment groups	**S**: 80 (40 Lev, 40 Des) **G**: Overall M: 27 F: 53 **A**: 36.5 (35 median) 19-67 range	**M**: CU-Q2oL **MS**: Not reported **I:** Secondary **O:** Disease severity	Increasing lev.& des. 4-fold improves CU symptoms in ¾ of patients. Improves QoL

Table 3.2 Continued

1: General	2: Study Characteristics		3: Participant Characteristics	4: Quality of Life	
First Author/ Country/	**Study Design (SD) Study Aim/ Objective (AO)**	**S: Service D: CU Descriptor C: Comparison**	**S: Sample Size (All)/ G:Gender/ A: Age in years (CU only)**	**M: Measure MS: Mean I: Importance/ O: Other**	**Study and QoL Conclusion**
42. Staubach (2006a) Germany	**SD**: Cross-sectional **AO**: To determine aspects of QoL affected by CU. factors that impact QoL	**S**: University Hospital **D**: CU **C**: Healthy Controls (C)	**S**: 196 (CU 100, C: 96) **G**: M: 33, F: 67, **A**: CU 42.3 ± 1.2, C: 42.8 ±1.4	**M**: Skindex-29 **MS**: 70 severe **I**: Primary **O**: HADS & SOMS*	QoL in CU markedly impaired to control, more for emotional & social function. Psychiatric diagnoses further impaired QoL
43. Staubach (2006b) Germany	**SD**: RCT **AO**: To test benefit of AWB (Autologous whole blood) injections	**S**: University Dermatology **D**: CU **C**: CU placebo	**S**: 56 (ASST+ 35, ASST- 21) **G**: M: ASST+: 9 ASST- : 6 F: ASST+ : 26, ASST-: 5 **A**: ASST+42.1±2.9, ASST- 45.5 ± 4.0	**M**: DLQI **MS**: 8.5 ± 1.0 & 9.3± 1.6 Mild **I**: Primary **O**: Rescue medication	ASST+ CU patients showed significantly reductions in disease severity, anti-histamine usage & QoL improvements with 8 weeks of AWB.
44. Thompson (2000) USA	**SD**: RCT **AO**: To investigate effect of 60mg twice daily fexo-fenadine HCL on QoL QoL, work/ classroom Productivity & regular activity	**S**: 70 Dermatology Centres **D**: CIU **C**: CIU placebo (p)	**S**:Study 1: 160 (60mg 87, P: 76) **G**: M: 60mg: 24 P: 22, F: 60mg: 63 P:51 **A**: 60mg: 40 ± 11 P: 38 ± 13 **S**: Study 2: 167 (60mg: 82 P: 85) **G**: M: 60: 14 P: 20, F: 60mg: 61 P: 65 **A**: 60mg= 38 ± 13 P = 40 ± 13	M: DLQI **MS**: S1: P: 11.0: F: 10.0 Mod S2: P: 12.1 F: 10.6 Mod Mild-moderate **I** : Primary **O**: Disease severity, WPAI**	DLQI scores sig. improved in the treatment group as to control for all variables. Fexofenadine 60mg improved HRQOL and other variables in moderate-severe CIU
45. Tondury (2011) Switzerland	**SD**: Cohort **AO**: To investigate effect of psychological factors on the course of CU	**S**: Tertiary/ University Dermatology **D**: CU **C**: None	**S**: 95 **G**: Female 55 (58%) **A**: 39.3±13.6 (range 16-79 yrs	**M**: DLQI, Skindex-29(S-29) **MS**:DLQI 10.2± 6.2 Mod S-29: 38.1± 21.6 Mod **I**: Primary **O**: PRISM***	PRISM showed high burden of suffering. Considerable impaired QoL reported but did not relate to PRISM over time.
46. Uguz (2008) Turkey	**SD**: Cross-sectional **AO**: To compare CIU patients with & without Axis 1 or Axis 2 (A! & 2) psychiatric disorder & healthy controls on QoL	**S**: University Hospital **D**: CIU Outpatients **C**: Health Controls (HC)	**S**: CIU 200, HC: 25 **F**: Axis 1 only: 17 35.00 ± 13.57 Axis 2 only: 16 33.04 ± 10.62 Axis 1&2: 19 37.32 ± 13.49 CIU only: 6 34.72 ± 1.75 HC: 17 35.48 ± 9.24	**M**: WHO-QOL BREF **MS**: No global score **I**: Primary **O**: No	Axis I & II psychiatric disorders seem considerable factors of QoL. Similar QoL between CIU patients with no Axis diagnosis & HC but CIU patients overall have sig. poorer QoL than HC

**Hospital Anxiety & Depression Scale and Screening for Somatoform Disorders* ** Work Productivity and Activity Instrument ***Pictorial Representation of Illness and Self Measure instruent

Table 3.2 continued

1: General	2: Study Characteristics		3: Participant Characteristics	4: Quality of Life	
First Author/ Country/	**Study Design (SD) Study Aim/ Objective (AO)**	**S: Service/ D: CU Descriptor C: Comparison**	**S: Sample Size/ G:Gender/ A: Age in years**	**M: Measure MS: Mean I: Importance/ O: Other**	**Study and QoL Conclusion**
47. Valero (2008) Spain	**SD**: Questionnaire validation **AO**: To validate the Spanish CU-Q2oL & to assess its	**S**: Dermatology centres **D**: CU **C**: CU severity groups	**S**: 695 (68% Spontaneous) **G**: Female: 62.1 % **A**: 42 ± 15	**M**: CU-Q2oL & Skindex-29 **MS**: CU-Q2oL 22.2 ± 15.6 Mild **I**: Primary **O**: No	Correlated well with skindex-29, good reliability, valid & sensitive to change. Suitable for clinical & research settings
48. Vena et al (2006) Italy	**SD**: RCT **AO**: To assess the efficacy & safety of oralcyclosposin A (CSA) in CIU	**S**: Outpatient Clinic **D**: CIU **C**: CIU placebo (P)/ Treatment group 16 & 8 weeks(W)	**S**: 99 (16W: 31, 8W: 33, P: 35) **G**: M: 16 W: 14, 8W: 16, P: 12 F: 16 W: 17 8 W: 17, P: 23 **A**: 16w: 44.0 ± 9.8, 8w: 37.1 ± 11.3 P: 41.7 ± 11.5	**M**: DLQI **MS**: 16W: 7.9 ± 5.6, Mild 8W: 7.9 ± 4.6 Mild P: 7.8 ± 5.7 all Mild **I**: Secondary **O**: Disease severity	Cyclosporine with cetrizine useful in the treatment of CIU. Less symptoms & a significant improvement in DLQI score.
49.Yadav et al (2008) India	**SD**: Pre-post test **AO**: To assess the prevalence of H.Pylori (HP) infection & effect of its eradicationin CIU	**S**: Allergy Clinic **D**: CIU **C**: Controls (C)	**S**: 136 CU 68, C: 68 **G**: M: CU: 37, C: NR, F: CU: 31 C: NR **A**: CU:33.54 ± NR (14-63), C: NR	**M** : CU-Q2oL **MS**: CU- HP: 70.92 ±12.59 CU: HP: 65.57 ±11.57 Severe **I**: Primary **O**: Rescue treatment	70% had HP related gastritis. 81% responded to eradication therapy. Patient response to treatment sig. as indicated on CU-Q2oL
50. Yun et al (2011) Australian, Sri Lanka	**SD**: Cross-section **AO**:To assess QoL in Sri Lankans& Australians (Aus)	**S**: Immunology Clinic/ University **D**: CIU **C**: Cultural groups	**S**: 125 Aus 43 (34.4%) Sri 82 (65.5%) **G**: F: 83 (60.4%) M: 42 (33.6) **A**: ≤ 40 61 (48.8%), ≥ 40 64 (51.2%)	**M**: CU-Q2oL **MS**: Not reported **I**: Primary **O**: None	Differences between Sri Lankan's & Australians in respect to mood, sleep, daily activities and food choice.
51. Zuberbier et al (2010) Europe Romania, Argentina	**SD**: RCT **AO**: To compare the efficacy & safety of bilastine (B) 20mg vs levocetirizine 5 mg (L) & placebo (P) CIU	**S**: Dermatology Centres **D**: CIU **C**: CIU Placebo/ Treatment Groups	**S**: 525 in moderate to severe CU **G**: B: M 63, F 109, L: M: 54, F:109 P: M: 40, F: 141 **A**: B: 41.7 ± 13.8, L: 39.8 ± 13.5 P: 39.4 ± 13.9	**M**: DLQI **MS**: 13.38 ± 5.96 Mod **I**: Secondary **O**: Disease-severity	Bilastine 20 mg is a novel, effective & safe treatment for the management of CIU. Also improves QoL scores as indicated on DLQI

3.3.2: Quality of Life Questionnaires

Quality of life was measured with 8 different questionnaires of which four were generic; three dermatology-specific and one disease-specific. Generic questionnaires included the SF-12 and SF-36 1992 used in five studies, the NHP used in two studies and the WHO QoL-Bref used in two studies. Dermatology-specific questionnaires included the Skindex (16 and 29) used in ten studies, the DLQI used in 28 studies (> 50% studies), the FLQA-d used in one study and the V-Dermato used in 3 studies. The disease-specific instrument was the CU-Q_2oL. Assessing QoL was a primary measure in 42 of the 53 studies of which 11 used two or more questionnaires. Overall questionnaires differed considerably in terms of items, domains, scoring and theoretical underpinning. Only four were directly subjected to psychometric assessment in CU: the DLQI (Lennox and Leahy, 2004; Shikar et al, 2005) and CU-Q_2oL (Baiardini et al, 2005; Broza et al, 2011; Mylnek et al, 2009; Valero et al, 2008), SF-12 (Reeves et al, 2004) and FLQA-d (Augustin et al, 2000).

3.3.3: Overall Quality of Life

The differences in the construction, subscale weightings and scoring of questionnaires meant that an overall QoL score was only available from instruments that produced composite scores. Thirty-one studies presented a composite mean QoL score (or one that could be calculated) however the overall impact of CU on QoL was dependent on the questionnaire used. A substantial 22 studies (41.51%) used the dermatology-specific DLQI where overall scores ranged from 5.10 ± 4.50 (Grob et al. 2009) to 14.00 (Kaplan et al. 2008), however an observation of Table 3.2 suggested that the substantial majority of studies ranged scores of around 9.50. With scores ranging from 0 (no impact) to 30 (worst impact) this represented a mild impact on QoL. Grob et al. (2008) replicated this mild impact using the V-Dermato where mean scores suggested a mild (borderline moderate) impact on a 0-100 scale. Conversely, four studies reporting Skindex-29 data reported scores off 29.0, 38.10, 42.0 and 70.0 (Brzoza et al. 2011; Tondury et al. 2011; Okubo et al. 2011 and Staubach et al. 2006a respectively). With scores ranging from 0 (better QoL) to 100 (worse QoL) this suggested a more moderate (to borderline severe) impact on QoL.

Overall scores from the SF-36 (presented as a physical and mental summary score where 0-49 means worse health and 51-100 better health) ranged from 58.25/ 56.85 (Ozkan et al. 2007) to 65.64/ 59.39 (Baiardini et al. 2003). With mean scores ranging around the scale mid-point this also suggested a moderate impact. Four studies presenting overall CU-Q_2oL scores (Valero et al. 2008 Bunselmeyer et al. 2009; Buyuloz et al. 2012; Yadav et al. 2008) reported scores of 22.20, 55.19, 57.50 and 70.92 respectively. With scores ranging from 0- 49 (better QoL) to 51-100 (worse QoL) this represented an overall moderate impact (average 51.45).

3.3.4: Aspects of Quality of Life

The full spectrum of aspects of quality of life affected by CU is presented in Tables 3.3 (p71). They are represented by component/ domain names as defined in the questionnaires from which they were derived. These components were further grouped into physical, psychological and social functioning independently by two researchers (DB and JK) before a consensus was made on what should go into each category. No distinctions were made as to how frequently individual aspects appeared in the text as this was more of a reflection of how often each QoL instrument had been used across studies as to their importance (e.g. pruritus and swelling are core impairments in CU but do not feature in studies pre-2005 as no CU specific instruments had existed whereas the less specific symptoms variable was an available option on instruments such as the DLQI and Skindex-29). It was considered that CU-Q2oL variables would have more weighting but this instrument is still largely untested and comes in various factor-analysed formats. At this stage the goal was to reveal the full spectrum of QoL aspects reported across studies regardless of frequency or degree of affect. To help researchers to look at certain aspects in more detail the QoL instruments that feature each item is also representated in Table 3.3 (p71) as well as the studies they feature in.

Physical Functioning

Reported problems regarding physical functioning were themed into one of three areas:

Table 3.3: Content Analysis of Bio-Psychosocial Aspects of Quality of Life in CU

Aspect	Component (Instrument)	Studies featured	n	% Studies
Physical	Physical Health **(C)**	13,46	2	03.92
	Physical Function/ Mobility **(A,B)**	4,6,33,36,7,31	6	11.96
	Role Limitation-Physical **(A)**	4,6,33,36	4	07.84
	Physical Pain/ Complaints **(A,B,F,G)**	2,4,6,16,17,18,33,36,7,31	10	19.60
	Vitality **(A)**	4,6,33,36	4	7.84
	Sleep **(B,H)**	3,7,8,9,10,12,29,31,41,47	10	19.60
	Energy **(B)**	7,31	2	03.92
	Pruritus **(H)**	3,8,9,10,12,29,41,47	8	15.69
	Swelling **(H)**	3,8,9,10,12,29,41,47	8	15.69
	Impact on Life Activities **(H,D,F,B,G)**	2,3,7,8,9,10,11,12,14,15,16,17,18,19,20,21,22,23,24,25,26,27,29,30,31,34,35,37,38,39,40,41,43,44,45,47,48,49,51	39	76.47
	Symptoms **(D,E)**	1,5,7,11,12,14,15,16,18,19,20,21,22,23,24,25,26,27,28,29,30,32,34,35,37,38,39,40,42,43,44,45,48,49,51	35	68.63
	Treatment **(D,F,G)**	2,7,11,12,14,15,16,17,18,19,20,21,22,23,24,25,26,27,29,30,34,35,37,38,39,40,43,44,45,48,49,51	32	62.75
	Psychological (generic)**(C)**	13,46	2	03.92
Psychological.	Emotional functioning **(A,B,F,E)**	2,1,4,5,6,7,28,31,32,33,36,42,45	13	25.49
	Mental Health/ Mood **(A,G)**	4,6,16,17,18,33,36	7	13.73
	Looks/ Self-image **(H,G)**	3,8,9,10,12, 16,17,18,29,41,47	11	21.57
	Feelings (D) Satisfaction **(F)**	2	1	01.96
	Social Relationships **(C)**	13,46	2	03.92
Social	Social function/ Life/ Isolation **(A,F,B,E,G)**	4,6,16,17,18,33,36,7,31	9	17.65
	Limits **(H)**	3,8,9,10,12,29,41,47	8	15.69
	Personal relationships **(D)**	7,11,12,14,15,16,18,19,20,21,22,23,24,25,26,27,29,30,34,35,37,38,39,40,43,44,45,48,49,51	30	58.82
	Leisure activities **(D,G)**	7,11,12,14,15,16,17,18,19,20,21,22,23,24,25,26,27,29,30,34,35,37,38,39,40,43,44,45,48,49,51	31	60.87
	Work or school **(D)**	7,11,12,14,15,16,18,19,20,21,22,23,24,25,26,27,29,30,34,35,37,38,39,40,43,44,45,48,49,51	30	58.82
Other	Environment **(C)**	13,46	2	03.92

A: SF-36, 12: 4: Baiardini, 2003; **6**: Barbosa, 2011a,b; **33:**Ozkan, 2007; **36:** Reeves, 2004

B: NHP: 7: Berrino, 2006; **31:**O'Donnell, 1997

C: WHOQoL Bref: 13: Engin, 2008; **46:** Uguz, 2008

D: DLQI - 7:Berrino, 2006; **11**:Dastghelb; **12:**Dias, 2011; **14:**Gimenez-Arnau, 2007; **15:**Godse, 2006; **16:**Grob, 2009;**18:**Grob, 2008; **19:**Jariwala, 2009; **20:**Kaplan, 2008; **21:**Kapp & Picher,2006; **22:**Kocaturk, 2011a,b; **23:**Lachapelle, 2006; **24:** Lennox & Leahy, 2004; **25:**Liu, 2012, **26:**Mageri, 2010; **27:**Mathias, 2010; **29:**Mylnek, 2009;**30:**Mylnek, 2008; **34:**Poon, 1999; **35:**Potter, 2008; **37:**Seidenari, 2006; **38:**Shikar, 2005; **39:**Silvares, 2011; **40:**Spector, 2007; **43:**Stuabach, 2006b; **44:** Thompson, 2000; **45:** Tondury; **48:**Vena, 2006; **49:** Yadav, 2008; **51:** Zuberbier, 2010

E: Skindex - 1:Akashi, 2011; **5**:Baker, 2008; **28:**Maurer, 2009; **32:**Okubo; **42:**Stubach, 2006a; **45:**Tondury

F: FLQA; **2**: Augustin 2000

G: V-Dermato: 16: Grob, 2009; **17:** Grob, 2005; **18:** Grob, 2008

H: CUQ2oL - **3**: Baiardini, 2005; **8**: Brozoza, 2011, **9**:Bunselmeyer, 2009; **10**:Buyukozturk, 2012; **12**:Dias, 2011; **29:**Mylnek, 2009; **41:**Staevska, 2010; **47:**Valero, 2008; **50:**Yun 2011

Physical Symptoms

CU and its symptoms were reported to impair quality of life generally (68.63% of studies, n= 35) but more specifically the most experienced symptoms were pruritus (15.69%, n= 8), swelling (15.69%, n= 8), physical pain/ complaints and sleep (both 19.60%, n= 10). Other symptoms included experiencing low vitality, energy and problems related to sleep and rest (see Table 3.3, p71).

Physical functioning/ limitations

Participants with CU across studies reported discomfort related to mobility (11.96%, n= 6), especially those with concurrent physical urticarial (O'Donnell et al. 1997). Undertaking daily life activities were also affected (76.47%, n= 39) and were covered as a domain in 5 of the 8 QoL instruments. Impaired physical functioning further impacted in the ability to undertake ones roles (07.84%, n= 6).

Treatment

The final aspect related to CU treatments and their negative impact on physical functioning which was reported in 62.78% of studies (n= 32) and represented by 3 questionnaires.

Psychological Functioning

Problems regarding psychological functioning were themed into three identified areas of concern:

Mental Health

Aspects related to overall psychological health but included reports of experiencing poorer than average mental health and mood (13.73%, n= 7) and negative feelings in general (01.96%, n= 1).

Emotional Responses

Participants across studies reported that CU negatively affected their emotional functioning which featured in a quarter of studies (25.49%, n= 13) and four QoL questionnaires.

Self-Perception/ Feelings

A fifth of studies (21.57%, n= 11) reported that CU negatively affected looks and self-image (using the

V-Dermato and CU-Q_2oL). One study reported that CU affected satisfaction with life (01.96%)

Social functioning

Problems regarding social functioning were themed into four identified areas

Personal relationships

Participants in over half of studies (58.82%, n= 30) reported that CU interfered personal relationships.

Social Interaction

CU affected social functioning leading to social isolation (17.65%, n= 9), which was covered, by 5 QoL instruments and limitations in social function (15.69%, n= 8), which was covered by the CU-Q2oL.

Leisure Activities

Participants across 60.87% of studies (n= 31) reported difficulties in participating in leisure activities because of CU and this aspect was covered by the DLQI and V-Dermato.

Work and Study

Participants with CU reported in over 50% of studies that the condition affected their undertaking of work or study activities (58.82%, n= 30) and these aspects were covered by the DLQI.

One aspect that it was agreed did not fit into the areas of physical, psychological and social functioning was the generic QoL aspect of environmental functioning which is separated from these three aspects in the WHO-QoL Brief instrument used in 2 studies (Engin et al. 2008; Ozkan et al. 2008).

Area of Quality of Life most Affected

Findings regarding areas of QoL most affected was collated from 21 studies and are presented in Table 3.4 a-h (p74). Due to the variety of different questionnaires of differing levels of specificity and contents used across studies, aspects reported were compared by the common questioonaire used in studies. Where possible scores across studies using the same instrument were collated to give an average score but should be taken as crude analyses as patient characteristic were not controlled for.

SF-36 data was available from two studies (Baiardini et al. 2003; Ozkan et al. 2007). With scores of 0-50 indicating poorer than average functioning and 51-100 better functioning the combined findings presented in Table 3.4a suggested that physical functioning, social functioning and role physical (roles requiring good mobility) were the most impaired with bodily pain being the least affected aspect. Scores for mental and emotional aspects lied between these aspects. It was noted that scores for physical functioning varied greatly between the featured studies.

Table 3.4: Comparison of Bio-Psycho-Social Aspects Affecting CU

3.4a: SF-36

	Baiardini, 2003	**Ozkan, 2007**	**Barbosa 2011**	**Average Score**
Physical Functioning	05.95 ± 22.73	63.00 ± 22.40	Scores NR	34.48 ± 22.57
Social Functioning	64.28 ± 24.77	67.10 ± 24.40		44.53 ± 24.59
Role Physical	58.33 ± 38.99	55.40 ± 37.60		46.50 ± 38.30
Vitality	53.33 ± 20.88	53.60 ± 20.00		53.47 ± 20.44
Role Emotion	60.32 ± 38.90	51.00 ± 43.60		55.66 ± 41.25
General Health	59.14 ± 16.82	53.50 ± 17.80		56.32 ± 34.62
Mental Health	59.62 ± 19.79	55.70 ± 18.50		57.66 ± 19.15
Bodily Pain	59.14 ± 30.19	61.10 ± 24.50		60.12 ± 27.35

* **Key**: 0-50: Poorer than average 51-100 Better than average

As shown in Table 3.4b data for the NHP was available from two studies (O'Donnell et al. 1997; Berrino et al. 2006) however only complete data was available from O'Donnell et al. (1997) where energy levels were the most reported as impaired followed by sleep and emotional functioning. Poorer energy and emotional functioning were also highlighted as significant areas by Berrino and colleagues.

Table 3.4b: NHP

NHP	**Berrino, 2006**	**O'Donnell, 1997**
Energy	28.02% ± 18.46*	47.00**
Sleep	NR	32.40
Emotion	33.30% ± 21.5	29.00
Pain	NR	15.80
Social	NR	13.30
Mobility	NR	07.10

Key: % of sample reporting as to % impairment, ** 0-100: Higher scores = worse outcome,

Data for the WHOQoL Brief was available from two studies (Engin et al. 2007; Ugus et al. 2008). With higher scores indicating poorer outcome, individual and combined study scores suggested

that environmental aspects of outcome were the least affected with psychological and physical aspects being the most and similarly impaired.

Table 3.4c: WHOQoL Brief

	Engin 2007	Ugus, 2008***	Average Mean Score
Psychological	65.22 ± 18.53	74.64 ± 12.50	69.93 ± 15.52
Physical	66.54 ± 18.73	71.76 ± 14.99	69.15 ± 16.86
Social	62.00 ± 21.56	75.76 ± 19.66	68.88 ± 20.61
Environmental	62.73 ± 13.96	68.92 ± 13.20	65.83 ± 13.58

Key: 0-100: Higher score = poorer outcome

As shown in Table 3.4d, data on the Skindex instruments could be extracted from 7 of the included studies. With scores ranging between 0-100 and higher scores indicating worse outcome, symptoms was ranked as the aspect most impairing QoL in 4 studies (Brzoza et al. 2011; Maurer et al. 2009; Mylnek et al. 2009; Tondury et al. 2011). Emotions was ranked second in these studies (except Mylnek et al, 2009) but ranked highest in two further studies emotions (Akashi et al. 2011; Okubo et al. 2007). Functioning was least affected overall.

Table 3.4d: Skindex-29, 16

Skindex-29, 16	Symptoms	Emotions	Functioning
Akashi, 2011*	25.00	46.00	18.00
Brzoza, 2011**	34.70	26.30	23.90
Maurer, 2009**	68.00	53.00	50.00
Mylnek, 2009**	40.00	22.00	38.00
Okubo, 2007*	42.00	58.00	18.00
Staubach, 2006b*	18.00	24.00	25.00
Tondury, 2011*	37.52 ±18.64	36.52 ± 21.67	23.46 ± 21.45

Key: 0-100: higher scores = worse outcome *mean score, **median score

Data for aspects of QoL for the DLQI is presented in Table 3.4e (p76). Data was presented in different ways and was absent in two studies (Berrino et al. 2006; Liu et al. 2012). Symptoms and feelings were reported as severe compared to other aspects in one study (Berrino et al. 2006) and above the scale mid-point in 2 studies (Liu et al. 2012; Shikar et al. 2005) where higher scores equal worse outcome. Symptom and feeling scores were reported by over 50% of the sample in Poon et al. (1999) but work and study was more reported in this study.

Table 3.4e: DLQI

	Berrino 2006*	Liu, 2012*	Poon 1999**	Shikar 2005*
Symptoms & Feelings	NR Severe	3.04 ± 0.10	56.00 ± 25 50.64%	3.49 ± 1.49/ 3.48 ± 1.39
Daily activities	NR moderate	NR	42.00 ± 31.00	1.92 ± 1.69/ 1.84 ± 1.60
Leisure	NR moderate	1.26 ± 0.10	44.00% ± 35.00	1.46 ± 1.64/ 1.38 ± 1.56
Work & School	NR moderate	NR	71.00 ± 36.00	1.21 ± 1.01/ 1.15 ± 1.04
Personal Relationships	NR moderate	NR	31.00% ± 32.00	1.04 ± 1.53/ 0.96 ± 1.39
Treatment	NR moderate	NR	15.00 ± 29.00	2.00 ± 0.79/ 0.51 ± 0.76

*Scale 1-5: higher scores = worse outcome, ** % of sample experiencing

Data from the FLQA-d was found in one study (Augustin et al. 2000. With higher scores indicating worse outcome on a scale of 1 to 5 (see Table 3.4f), the findings indicated that everyday living and satisfaction levels were the most affected followed by emotional status. Social life appeared to be the least affected with physical complaints and treatment reports falling at the scale mid-point.

Table 3.4f: FLQD-d

FLQA-d	EL	SA	ES	PC	TM	SL
Augustin, 2000	3.11 ± 0.98	3.10 ± 0.85	2.91 ± 0.55	2.50 ± 0.60	2.46 ± 0.92	2.38 ± 1.06

PC: Physical complaints TM: Treatment ES: Emotional status SL: Social life SA: Satisfaction EL: Everyday life
*1-5 Higher scores = worse outcome

As shown in Table 3.4g, data from the V-Dermato was available from one study. With higher scores indicating worse outcome findings from this instrument indicated that physical discomfort and mood state were the most impaired. Treatment aspects were the least impaired.

Table 3.4g: V-Dermato

	PD	MS	LA	DL	SF	SP	TR
Grob, 2005	61.40 ± 23.70	50.30 ± 25.00	36.70 ± 28.10	36.20 ± 20.40	27.50 ± 22.90	23.80 ± 21.80	17.00 ± 20.70

PD: Physical discomfort, MS: Mood state, TR: Treatment induced restrictions, SP: Self-perception, SF: Social functioning, LA: Leisure activities DL: Daily living activities, 0-112 Higher score = worse outcome

Data for the CU-Q2oL was available from 5 studies as presented in Table 3.4h. Establishing which areas were more affected was not clear as the included studies included different factor analysed versions of the instrument, however 4 of 5 studies found that pruritus was the most detrimental aspect of CU-related quality of life with mean and median scores falling around the 0-100 scale mid-point (except Dias et al. 2011) representing a moderate impact. The second ranking aspect indicated was sleep problems (Kocaturk et al. 2011; Mylnek et al. 2009; Valero et al. 2008) were score fell just below the

scale mid-point but also indicated a moderate impact.

Table 3.4h: CU-Q2oL

Author

Brzoza, 2011*		Dias, 2011**		Kocaturk, 2011***		Valero, 2008**	Mylnek, 2009*	
Itch	62.00*	Sleep/mental status/eating	39.90	Pruritus	50.00/ 57.30	46.10 ± 23.60	Itch/Emba	50.00**
Swell/Ms	40.00*	Pruritus/Life activities	34.40	Swelling	12.50/ 21.60	10.80 ± 19.50	Sleep	44.00**
Sleep	30.00*	Swelling/limits/looks	34.80	Sleep	45.00/ 44.10	24.40 ± 21.00	Swell/Eat	31.00**
Embarass	58.00*			Looks	20.00/ 24.30	17.80 ± 17.20	MS	31.00**
Function	34.00*			Life activities	25.00/ 28.50	21.00 ± 18.20	Limits/Looks	31.00**
Eat/ limits	26.00*			Limits	33.30/ 32.10	20.80 ± 18.70	Function	29.00**

*0-50: Better than average, 51-100 Poorer than average *Median score, **Mean score, ***Mean & median score, Yun 2011 NR

3.3.5: Patient Characteristics and Quality of Life

Relationships between Socio-Demographic Characteristics and Quality of Life

Fifthteen studies explored relationships between socio-demographics and QoL (see Table 3.5, p78) but the use of different QoL questionnaires made comparisons complicated. Fourteen studies exploring age and QoL indicated that age did not statistically relate to or predict QoL however exceptions were found. Ozkan et al. (2008) found that higher age positively correlated with impaired social function and mental health of the SF-36. Further Mylnek et al. (2009) who used the CU_2-QoL found that age predicted daily functioning, sleep, itching/ embarrassment and swelling/eating domains where older patients were more severely affected by problems with sleep and swelling/ eating and younger patients with itching/ embarrassment and daily functioning. Of the twelve studies comparing relationships to gender it was found that this relationship was also generally insignificant however there tended to be a consensus that women were more affected than men in domains related to symptoms and appearance. Maurer et al. (2009) found that women were strongly and significantly more affected on the Skindex-29 symptom scale than men and Mylnek et al. (2009) found that women were more impaired on the itch/embarrassment and looks/limits domains of the CU_2QoL. In line with this, Ozkan et al. (2007) found worse physical functioning and bodily pain in females in addition to poorer vitality and role-emotion of the SF-36. Although not significant, Poon et al. (1999) found that men were more affected in the areas of

work/ study (49.0% of sample) and leisure activities (32.0%) of the DLQI than women (i.e. 32.0% and 22.0% respectively). Education (Ozkan et al. 2007, Maurer et al. 2009), marital (Ozkan et al. 2007) and economic status (Ozkan et al. 2007) were found to be unrelated to QoL

Table 3.5: Relationships between Socio-Demographic Characteristics and Quality of Life

Study	Age	Gender	Other
SF-36			
Ozkan, 2007*	Social Function: *P*= .01; *r*= .274 Mental Healrh: *P*= .02; *r*= .245	Women > affected Physical Functioning *P* =.02 Bodily Pain *P* =.03 Vitality *P* =.02 Role Emotional *P* =.03	Education, marital economic status all Insignificant
WHO-QoL			
Engin, 20	Physical *r* = -0.16 Psychological *r* = -0.01 Social relationships *r* = 0.11 Environmental *r* = -0.05 All insignificant at .05	Not reported (NR)	NR
Skindex-29, 16			
Maurer, 2009	Age insignificant	Gender sig. predictor of symptoms: Women > affected (*p*< 0.001)	Educational & employment insig.
Okubo, 2011	Functioning 0.42 (*r* = 0.42, *p0.01*)	NR	NR
Staubach 2006a	QoL impaired independent of age	QoL impaired independent of gender	
DLQI			
Godse 2006	Age unrelated	NR	NR
Liu, 2012	Age unrelated	women > affected Daily activity *p*=.02 Work/ school *p*=.03	NR NR
Poon, 1999	Mean score not affected by age	Mean score not affected by gender	NR
Silvares, 2011		Gender predicted greater impact on Clothing *p* < .05 (women > affected) Work & study *p* < .05 (men > affected)	NR
CU-Q$_2$oL			
Broza, 2011	Age unrelated	Gender unrelated	NR
Dias, 2011	Age not predictor	Gender not predictor	NR
Kocaturk, 2011	Age predicted Pruritus *p* <.05	Gender predicted sleep problems (*p* < .05) with women more affected.	NR
Mylnek, 2009	Predicted functioning, sleep, itching/ embarrassment and swelling/eating, all *p*<.01	Women predicted as more affected by itching/ embarrassment (*p*= 0.001) and looks limits (*p*= 0.048).	NR

Relationships between Clinical Variables and Quality of Life

As shown in Table 3.6 below, twelve studies assessed disease-severity/ activity and QoL but assessment varied considerably. Some used versions of the Urticaria Activity Score (UAS) which measures the number/ size of wheals and intensity of itch over a period of time, but others consisted of systems including further symptoms and reactions, visual analogue scales and different combinations of patient and physician subjective and/ or objective ratings, however consistent patterns were found. Severity/ activity of CU were statistically unrelated to generic health status and QoL (SF-36 and WHOQoL studies) but significantly related to all aspects of dermatology and disease-specific QoL (Skindex, DLQI and CU-Q_2oL studies). Nine studies explored relationships between disease-duration and QoL. Disease-duration generally did not significantly correlate with QoL outcome but correlated with more treatment induced restrictions in one study (Grob et al. 2005) and worse physical functioning in another (Ozkan et al. 2007). Other clinical factors reported to worsen QoL overall included treatment satisfaction (Okubo et al. 2011), having CU plus *helicobacter pylori* (a gut bacterium; Yadav et al. 2008), gaining a positive ASST (an allergic reaction to one's skin serum; Godse, 2006) and experiencing concurrent angioedema (Silvares et al. 2011). In regards to particular aspects, urticaria type predicted more pruritus and impaired life activities (Dias et al. 2011) and experiencing concurrent physical urticarias (esp. delayed pressure) significantly related to more pain (O'Donnell et al. 1997).

Table: 3.6 Relationships between Clinical Characteristics and Quality of Life

Study	Disease severity/ activity	Disease duration	Other
SF-36			
Ozkan, 2007	Insignificant across domains	PF (*P*= .009; *r* = .286)	NR
WHO-QoL			
Engin, 20	All insignificant ($p > .05$), UAS Physical health r= 0.14 Psychological health r =0.07 Social relationships r= 0.03 Environmental health r= 0.06	All insignificant ($p > .05$) Physical health r= 21 Psychol. health r= -.05 Social relations r= .11 Environ. health r=.12	NR
NHP			
O'Donnell, 1997	NR	NR	Controlling for age & gender CU with delayed pressure urticaria > impaired for NHP pain p =.002

Table 3.6 continued

Study	Disease severity/ activity	Disease duration	Other
Skindex			
Okubo, 2011	Itching (All $P = 0.01$) Global Skindex-16 $r = 0.40$ Symptoms $r = 0.52$ Emotions $r = 0.34$ Functioning $r = 0.42$	NR	Satisfaction with treatment insignificant
Staubach, 2006a	QoL impaired independent of angioedema or CU cause	QoL impaired independent of duration	QoL impaired independent of disease cause
DLQI			
Dias, 2011	Disease severity predicted Overall QoL $p < .001$ Pruritus/ life activities $p < .001$ Swelling/ looks/ limits $p = .012$	QoL no predicted by duration	Urticaria types predicted Pruritus/ life activities $p = .04$
Godse 2006	NR	NR	ASST+ CU (21/30) more affected than – ASST- (9/30)
Kocaturk 2011a	NR	NR	ASST- autologous whole blood serum test, (AWB) CU more affected than ASST+
Mylnek, 2008	Sig. $r_2 = .31$, $p < .05$	NR	NR
Seindenari 2006	QoL worse in severe CIU	NR	NR
Silvares, 2011	NR	Symptoms and clothing	Presence of angioedema significantly related to higher DLQI scores ($p < .01$)
V-Dermato			
Grob, 2005	Measured but controlled for not analysed on outcome	Measured as age of first manisfestation but controlled for not analysed on outcome	Measured but controlled for not analysed on outcome
CU-Q20L			
Broza, 2011	UAS-7 severity predict Itching p .001 Swelling/ mental p .03 Functioning p .02 Sleep B .36, p .03 Eating/ limits p .37 Embarrassment p .04	Insignificant across subscales	NR
Buyulozturk, 2012	UAS-reduced & QoL improved after drug intervention: Overall QoL* Pruritus* Swelling*Life activities* Sleep*Limits*** Looks** *p <.001 ** p <.01 p<.05***	NR	NR

Table 3.6: Continued

Study	Disease severity/ activity	Disease duration	Other
Kocaturk, 2011b	UAS-7 predicted overall QoL* Pruritus* Swelling*** Life activities** Sleep Limits* Looks* *p <.001 ** p <.01 p<.05***	Duration not a significant predictor	ASST results insignificant
Mylnek, 2009	UAS-7 severity predicted all subscales (p<.001)	Insignificant across subscales	NR
Valero, 2008	Greater severity of wheals/ pruritus, greater impaired QoL	NR	NR
Yadav, 2008	NR	NR	CU patients with helicobacter pylori infection more impaired 70.92 ± 12.59 verses 65.57 ± 11.57*
Yun, 2011	NR	CU > 1 year > affected by wheal, tiredness, irritability	NR

*0-49 better outcome, 50-100 poorer outcome

Personality, Psychological Co-Morbidity and QoL

Six studies explored personality and or psychological co-morbidity factors on quality of life. As shown in Table 3.7 (p82) two studies indicated that those with alexithymia and other psychiatric disorders were significantly more impaired on the mental health and vitality aspects of QoL compared to those with a CU diagnosis only (Barbosa et al. 2011; Ozkan et al. 2007). Two further studies found that those with concurrent personality disorders generally reported worse QoL across all aspects verses those with CU only (Ugus et al. 2008; Staubach et al. 2006a). In the three studies exploring anxiety and depression, higher levels of both co-morbidities significantly related to poorer QoL in all aspects in one study (Engin et al. 2007) and physical functioning, social functioning, mental health and general health in another (Barbosa et al. 2011). Staubach et al. (2006a) found no significant differences in this respect. One study (Tondury et al. 2011) found that patients with CU who were not open to new ways of seeing phenomena (described as being cognitively inflexible) reported significantly worse quality of life than those who were described as cognitively flexible.

Table 3.7: Relationships between Personality, Psychological Co-Morbidity and QoL

Study	Personality	Anxiety and Depression	Other
SF-36			
Barbosa, 2011a,b	Sig. Diff between Alexithymia verses non-alexithymia CIU Mental Health (MH): z= 2.724; p<.0.00 Vitality (VT): z= 2.882; p<0.00	Sig difference in QoL of CIU patients with moderate & severe anxiety and Physical Functioning (PF) z= 2.585; p<.04 Social Functioning z= 2.064; p<.04 Mental Health z= 2.918; p<.00 General Health z= 2.267; p<.02	NR
Ozkan, 2007	CU+ Vs CU- psychiatric disorder PF: 70.3 ± 17.5/ 58.3 ± 24.0 *p*.01* VT: 61.3 ± 19.9/ 48.3 ± 18.4 *p*.00* MH: 60.0 ± 19.3/ 52.1 ± 17.3 *p*.03*	N/A	NR
WHO-QoL			
Engin, 2007	NR	Anxiety BAI/ Depression BDI, *P*<.01* Physical health r= -0.53/ -0.72* Psycho. health r= -0.55/ -0.73* Social relationship r= -0.43/ -0.67* Environ. health r= -0.36/ 0.55*	NR
Ugus, 2008	Difference between CU groups with/ without DSM disorder *P* <.0001 Physical health *F*= 10.61 Psychol. Health *F*= 09.09 Social relationship *F*= 10.44 Environ. health *F*= 05.54	NR	NR
Skindex29			
Staubach, 2006a	CU+ psychiatric disorder sig. more impaired than CU without: Symptoms: *p* <.05 Emotions: *p* <.005 Functioning: *p* <.01	QoL similar in those with CU+ anxiety, depression, somatoform disorder	NR
DLQI			
Tondury, 2011	NR	NR	Cognitively inflexible patients have worse QoL

*0-49 worse outcome, 50-100 better outcome

3.3.6: Quality of Life against Reference Populations

Eleven studies used reference populations to compare CU-related quality of life.

Other Dermatological Conditions

As shown in Table 3.8a four studies compared CU with other dermatological conditions. Poon et. al. (1999) found that those with CU and concurrent delayed pressure urticaria reported impairments (not as severe but) comparable to severe atopic dermatitis (AD) and psoriasis outpatients but worse than acne and vitiligo patients. In contrast, Grob et al. (2005) and Augustin et al. (2000) found that AD patients generally reported a greater impact over CU and psoriasis patients. Further Akashi et al. (2011) reported worse QoL in those with prurigo chronic multiformis than those experiencing CU.

Table 3.8a: Quality of Life in Chronic Urticaria verses other Dermatological Conditions

Study	Chronic Urticaria	Dermatological Disorders
Skindex-29*		
Akashi, 2011	Chronic urticaria Symptoms: 26.00* Emotions: 46.00* Functioning: 15.00*	Prurigo chronica multifotmis Symptoms: 30.00* Emotions: 58.00* Functioning: 18.00*
DLQI**		
Poon, 1999	CU 25.00% ± 24.00% CU with DPU 43.00% ± 23.00%	Atopic dermatitis 60.00% Psoriasis 29.70% Acne 24.30% Vitiligo 16.10%
FLQA-d***		
Augustin, 2000	Chronic Urticaria* Physical complaints: 2.40** Everyday life: 3.20 Social life: 2.30* Emotional status: 3.20 Treatment: 1.80*** Satisfaction: 3.20*	AD* Psoriasis* Physical complaints: 2.80 2.40*** Everyday life: 3.40 2.90*** Social life: 2.60 2.20*** Emotional status: 3.30 2.80*** Treatment: 2.60 2.60 Satisfaction: 3.40 3.00*** AD sig. more affected than CU & psoriasis on most scales (p .05*, p.01**, .001***)
VDermato▲		
Grob, 2005	Chronic Urticaria	Atopic Dermatitis / Psoriasis / ANOVA
	Self-perception (SP): 23.80 ± 21.8	SP: 34.20± 24.5 / 37.40± 24.7 / < 0.001
	Daily living activities (DL): 36.20 ± 20.4	DL: 35.50± 21.3 / 19.30± 19.4 / < 0.001
	Mood state (MS): 50.30 ± 25.5	MS: 50.10± 25.5 / 49.30± 25.2 / < 0.01
	Social functioning (SF): 27.50 ± 22.9	SF: 34.10± 23.5 / 31.30± 23.7 / < 0.01
	Leisure activities (LA): 36.70 ± 28.1	LA: 46.70± 27.9 / 47.20± 29.3 / < 0.001
	Treatment restrictions (TR) 17.00 ± 20.7	TR 32.50± 26.4 / 38.60± 26.0 / < 0.001
	Physical discomfort (PD) 61.40 ± 23.7	PD: 69.80± 21.3 / 44.40± 28.2 / < 0.001

All higher score worse outcome ***Skindex-29:** 0-100, ****DLQI:** 0-100%,*****FLQA-d:** 1-5, ▲ **V-Dermato:**0-112

Non-Dermatological Conditions

Finally, two studies compared CU to non-dermatological disorders. As highlighted in Table 3.8b, data from the SF-36 indicated that (with exception to similar mental health and better vitality) CU has a more significant impact on most aspects of general health status over respiratory allergy (Baiardini et al. 2003). Using the NHP, O'Donnell et al (1997) found similar levels of energy, sleep and emotions in CU and ischemic heart disease, but worse sleep, less pain and better mobility in CU.

Table 3.8b: Quality of life in CU verses Non-Dermatological Conditions

Study		Chronic Urticaria	Non-Dermatological	
SF-36*				
Baiardini, 2003	Domain	Chronic urticaria	Respiratory Allergy	
	Physical functioning	85.95 ± 22.73	94.07 ± 08.55	*p 0.05*
	Bodily Pain	59.14 ± 30.19	91.11 ± 13.44	*p 0.00*
	Vitality	53.33 ± 20.88	48.15 ± 16.53	*p 0.82*
	Role emotional	60.32 ± 38.90	79.01 ± 33.52	*p 0.04*
	Role physical	58.33 ± 38.99	81.48 ± 28.24	*p 0.01*
	General health	59.14 ± 16.82	72.18 ± 15.96	*p 0.00*
	Social functioning	64.28 ± 24.77	69.44 ± 20.89	*p 0.21*
	Mental health	59.62 ± 19.79	65.33 ± 16.00	*p 0.13*
NHP**				
O'Donnell, 1997	Domain	Chronic urticaria (%)	Ischemic heart disease (%)	
	Mobility	07.10	NR***	
	Sleep	32.00		
	Social	13.30		
	Pain	15.80		
	Energy	47.00		
	Emotion	29.00		

***SF-36:** 0-49 poorer outcome, 51-100 better outcome, ****NHP:** 0-100 higher score worse outcome ***Poor print on original document

Healthy Controls and Reference Populations

As presented Table 3.8c (p86) there was a consistent finding that individuals with CU reported significantly more impaired QoL than both healthy controls independent of patient characteristics.

Table 3.8c: Quality of life in CU Verses Healthy Controls/ Reference Samples

Study	Chronic Urticaria	Health Controls/ Reference Samples
SF-36*		
Baiardini, 2003	PF 85.95 ± 22.73RP 58.33 ± 38.99 BP 59.14 ± 30.19GH 59.14 ± 16.82 VT 53.33 ± 20.88SF 64.28 ± 24.77 RE 60.32 ± 38.90MH 59.62 ± 19.79	CU patients strongly & significantly more impaired on all subscales than 608 health adults from reference sample ($p <$ *0.0001)*
Barboas, 2011ab	NR	QoL> impaired to age/ sex match healthy adults, all $p <$ .000 PF t: -4.795, SF t -5.213 RP t -7.681, RE t -7.230 MH t -6.310, BP t -5.916 VT: t -5.363, GH t -8.501
Ozkan, 2007	PF: 63.00 ± 22.40 RP: 55.4 ± 37.6 BP: 61.10 ± 24.50 GH: 53.5 ± 17.8 VT: 53.60 ± 20.0 SF: 67.1 ± 24.4 RE: 51.90 ± 43.6 MH: 55.7 ± 18.5	QoL > impaired than age/ gender matched controls, all $p <$ .01 PF: 82.3 ± 17.9, t -5.91 RP: 82.30 ± 30.6, t -4.89 BP: 72.5 ± 22.1, t -3.01 GH: 65.70 ± 19.4, t -4.03 VT: 63.0 ± 21.2, t -2.84 SF: 82.30 ± 19.4, t -4.22 RE: 80.8 ± 33.4, t -4.79 MH: 67.60 ± 17.9, t -4.04
WHO-QoL**		
Engin, 2007	PH: 66.54 ± 18.73 PS: 65.22 ±18.53 SO: 62.00 ± 21.56 EN: 62.73 ±13.96	CU patients more impaired to age/ sex match control *P <.05 PH: 77.74 ± 11.08 z -3.27* PS:72.25 ± 12.64 z -2.13* SO: 69.42 ± 17.94 z -1.91 EN:62.65 ± 9.48 z -.37***
Ugus, 2008	CU (group 4, no psychiatric disorder) PH: 71.76 ± 14.99 PS: 74.64 ±12.58 SO: 75.76 ± 19.66 EN: 68.92 ±13.20	CU more impaired to healthy controls, all sig p <.0001 PH: 78.04 ± 11.19, *F* 10.61 PS: 75.48 ± 11.60, *F* 9.09 SO: 74.40 ± 13.99, *F* 10.44 EN: 70.72 ± 11.23, *F* 5.45
Skindex29***		
Staubach et al 2006a	Overall: 75.00* Symptoms: 18.00* Emotions: 25.00* Functioning: 25.00*	CU > impaired than healthy age/ sex controls All p<.005 Overall: 13.00* Symptoms: 11.00* Emotions: 13.00* Functioning: 13.00*

***SF-36:** 0-49 poorer outcome, 51-100 better outcome PF: Physical functioning, BP: Bodily Pain, VT: Vitality, RE: Role emotional, RP: Role physical, GH: General health, SF: Social functioning, MH: Mental health PH:
****WHO-QoL:** 0-100 higher score poorer QoL Physical health, PH: Psychological functioning, SO: Social functioning, EN: Environmenral
*****Skindex-29:** 0-100 higher score poorer QoL

3.3.7: Methodological Quality of Studies

Most studies met the quality criteria (see Table 3.9, p87), however only eleven reported a power analysis and despite all reporting participation rates only seven reported recruitment response rates at baseline. The differences in characteristics between participation responders and non-responders were presented in only four studies. The reporting of participant treatments at baseline was excellent in RCT studies but poor in cross-sectional and questionnaire validation studies. Finally, although most studies used validated QoL questionnaires, only four had been formally validated in CU samples and these were the DLQI, CU-Q_2oL, SF-12 and the FLQA-d instruments.

Table 3.9: Quality Assessment of Included Studies

	Socio-demographic & clinical variables described	Inclusion and/ or exclusion criteria formulated	Data collection process described	The type of CU is treatment is described for baseline	Results compared between two or groups or more	Participation & response rates for patient groups	Characteristics of responders and non-responders or if there's no selective response at baseline	Standardized or valid QoL questionnaire used	Results described for QoLand physical, psychological and social domain	Mean, median, SD or % reported for important outcomes	Attempt made to find a set of determinants with highest prognostic value	Patient signed a informed consent	A power analysis was carried out
Akashi, 2011	●	○	●	○	▪*	▪	○	●	●	●	●	●●	○
Augustin, 2000	●	○	●	●	●	▪	○	●	●	●	○	○	○
Baker, 2008	●	●	●	▪	●	▪	○	●	○	○	●	●	○
Barbosa, 2011a,b	●	●	●	●	●	●	○	●	●	▪	●	●	○
Baiardini, 2005	●	●	●	○	○	▪	○	●	●	○	●	○	○
Baiardini, 2003	●	○	●	●	●	▪	○	●	●	●	○	●	○
Berrino, 2006	●	●	●	○	○	▪	○	●	●	●	▪- **	●	○
Brzoza,	●	○	●	○	○	▪	○	●	●	●	●	●	○
Bunselmeyer	●	●	●	●	○	▪	○	●	○	●	●	●	○
Buyulozturk, 2012	●	○	●	●	○	●	○	●	●	●	●	○	○
Dastghelb,	●	●	●	●	○	▪	▪	●	●	●	●	●	○
Dias, 2011	●○	▪	●	▪	●	▪	▪	●	●	●	●	●	●
Engin, 2008	●	●	●	●	●	▪	○	●	●	●	●	●	○
Gimenez-Arnau, 2007	●	●	●	●	●	▪	○	●	●	○***	●	●	●
Godse, 2006	●	●	●	○	○	▪	○	●	○	●	●	▪	○
Grob, 2009	●	●	●	●	●	▪	○	●	●	●	●	●	○
Grob, 2008	●	●	●	●	●	▪	○	●	●	●	●	●	
Grob , 2005	●	●	●	○	●	▪	○	●	●	●	●	○	○
Jariwala, 2009	●	●	●	●	○	○	○	●	●	●	○	●	○
Kapp & Picher, 2006	●	●	●	●	○	●	○	●	○	●	●	●	●
Kaplan, 2008	●	●	●	●	○	○	○	●	○	○***	●	○	○
Kim, 2008	●	●	●	●	○	▪	○	○	●	●	●	●	○
Kocaturk, 2011a	●	●	●	●	●	▪	○	●	○	●	●	●	
Kocaturk, 2011b	●	●	●	●	●	▪	○	●	●	●	●	●	○
Lachapelle 2006	●	●	●	●	○	▪	○	●	●	●	●	●	○
Lennox & Leahy 2004	○#	○#	●	○#	○	▪	○	●	●	●	●	●	○
Liu 2012	●	●	●	▪	●	▪	○	●	●	●	●	●	○

Met ● Partially met ▪ Not reported ○ *Data available to compare but not formally compared, **Qualitative accounts ***Not QoL, #Reported elsewhere ●+ Multivariate ●-Univariate

Table 3.8: Quality continued

	Socio-demographic & clinical variables described	Inclusion and/ or exclusion criteria formulated	Data collection process described	The type of CU treatment is described for baseline	Results compared between two groups or more	Participation & response rates for patient groups	Characteristics of responders and non-responders or if there's no selective response at baseline	Standardized or valid QoL questionnaire used	Results are described for QoL & physical psychological and social domain	Mean, median, SD or percentages are reported for important outcomes	Attempt made to find a set of determinants with highest prognostic value	Patient signed an informed consent▲	A power analysis was carried out
Magerl, 2010	●	●	●	●	○	▪	○	●	●	○	●	●	○
Maithias, 2010	●	●	●	●	○	▪	○	●	○	●	○	●	●
Maurer, 2009	●	●	●	▪	○	▪	●	●	●	●	●	○	○
Mylnek, 2009	●	○	●	○	●	▪	○	●	●	●	●	●	●
Mylnek, 2008	●	○	●	○	○	▪	○	●	○	○	●	○	○
O'Donnell, 1997	●	●	●	▪	●	▪	○	●	●	●	○	●	○
Okubo, 2011	●	○	●	●	●	▪	○	●	●	●	●	●	○
Ozkan, 2007	●	●	●	●	●	▪	○	●	●	●	●	●	○
Poon, 1999	●	○	●	○	○	▪	○	●	●	●	○	●	○
Potter, 2008	●	●	●	●	●	▪	○	●	○	●	●	●	●
Reeves, 2004	●	●	●	●	○	●	○	●	○	●	●	●	○
Seidenari, 2006	●	●	●	●	●	▪	○	●	●	●	●	●	●
Shikiar, 2005	○*	●	●	○	○	▪	○	●	●	●	●	○	○
Silvares, 2011	●	○	●	●	●	▪	○	●	●	●	●	●	●
Spector, 2007	○	●	●	○	●	●	○	●	○	●	●	●	○
Staubach, 2006a	●	●	●	○	●	▪	○	●	●	▪	●	●	○
Staubach, 2006b	●	●	●	●	●	▪	○	●	○	●	●	●	○
Staevska, 2010	●	●	●	●	●	▪	○	●	○	○	●	●	●
Thompson, 2000	●	●	●	●	○	●	○	●	●	●	●	●	○
Tondury, 2011	●	●	●	○	●	▪	●	●	●	●	●-	●	○
Uguz, 2008	●	●	●	○	○	▪	○	●	●	●	●	●	○
Valero, 2008	●	○	●	●	○	▪	○	●	●	●	●	●	○
Vena, 2006	●	●	●	▪	●	●	●	●	●	●	●	○	●
Yadav, 2008	●	●	●	○	●	▪	○	●	○	●	●	●	○
Yun, 2011	●	●	●	○	●	▪	●	●	●	●	●	○	○
Zuberbier, 2010	●	●	●	●	●	▪	▪	●	●	●	●	●	●

Met ● Partially met ▪ Not reported ○ ▲ met if ethical approval was stated * reported in another paper Shikiar(Nelson, Reynolds, Mason, 2000 and Finn, Kaplan, Fretwell, Long, 1999); Spector (Kaplan, Spector, Meeves et al, 2005)

3.4: Discussion

The objective of this study was to achieve a consensus view on the nature of quality of life in CU; however the heterogeneity between studies in respect to design, participant characteristics, QoL questionnaires used and severity measures applied complicated data synthesis. A more stringent inclusion criterion may have increased homogeneity but too few studies would have reduced external validity. Despite this consistent findings did emerge and are discussed in further detail below

Chronic Spontaneous Urticaria has a mild-moderate impact on Quality of Life

Although the results of the included studies could not be collated together comparisons across studies by a common QoL instrument predominantly provided mean (or median) scores which lied within a mild or moderate impact regardless of whether a generic, skin-specific or disease-specific questionnaire was used however this finding was not conclusive. On a closer observation of the data there appeared to be conflicting findings between scores that were presented from the SF-36, Skindex-29, CU-Q_2oL and the DLQI. Where the SF-36, Skindex-29 and CU-Q_2oL scores overall indicated strong evidence to support that CU had a moderate overall impact on QoL, scores of the DLQI suggested a mild impact. These findings suggest that the impact of CU on QoL may not range from mild to moderate but be either mild or moderate and which value to accept may depend on the validity of the DLQI against other instruments. Although this is not a measurement review this finding suggests that the estimated reports of impact found by researchers may be dependent on their choice of QoL instrument. This finding of a difference between the DLQI and other instruments is an important one as the DLQI is the most dominant QoL instrument used in dermatological research and practice (Basra, Fenech, Gatt et al. 2008) and this was reflected in its use in over fifty-percent of the included studies in this systematic review. Based on this review study and the extensive use of the DLQI in clinical practice, it can be hypothesised that patient-reported QoL at this level might possibly be underestimated.

Policy and practice based decision making processes based on research using measures that underestimate the true impact of CU on QoL may have implications on CU patient care at both the individual and population level. At the individual level it may suggest that these patients' subjective accounts of overall impairment are minimal and so little therapeutic input is required. Used in clinical trials it may underestimate the efficacy of therapeutic interventions due to a lack of the instruments responsiveness to change (the DLQI is extensively used in CU-based RCTs). Further CU-related QoL research based on measures that underestimate impact in the CU population might harm financial applications for CU-specific research, health and support resources where competition for such grants which may go to what are seen as more moderate to severe conditions. It could be argued that the DLQI is the true estimate of overall QoL impact in CU but a systematic review of QoL questionnaires in CU would need to be undertaken to help decide which instrument/s provide the most valid reports. Until then the evidence suggests that CU has at least a mild to moderate impact on overall quality of life.

Whatever the degree of QoL impact these findings confirm that CU is not just a benign condition with no impact on patient functioning and minimal impact on QoL (Grob and Gaudy-Masqueste, 2006) as originally found by O'Donnell et al. (1997) the review findings support the decision made in current CU expert management guidelines that in the future QoL assessment should be undertaken in both CU-related research and clinical practice (Zuberbier et al. 2009). CU does impact QoL regardless of the instrument used as demonstrated in the review by Weldon (2006) however the recommended QoL questionnaire suggested since this systematic review was first undertaken is the disease-specific CU-Q_2oL as it would show the greatest sensitivity over other instruments (Baiardini et al. 2011). It is argued that such a decision may not be simple as it has been stated at various times in this thesis that although the CU-Q_2oL maybe more internally valid the review further drew attention to different versions of the CU-Q_2oL, validated in different ways (e.g. language translation, factor analysis) with different domains that do not

allow for between CU study comparison. More problematic guidelines do not consider that when used alone the CU-Q_2oL does not allow for cross-disease comparison when competing for research grants or address wider generic issues so an analysis of generic instruments that complement the CU-Q2oL is suggested as a recommendation for future research.

CU affects many aspects of bio-psychosocial functioning

The second main finding of the review confirmed that impairment in those experiencing CU goes beyond problems concerning participating in daily activities and other aspects of physical functioning. At the study selection criteria stage of this systematic review many RCT papers were excluded because they only measured CU outcome in terms of such physical aspects. A data synthesis of the full spectrum of QoL aspects reported across studies revealed a variety of psychosocial impairments. Although CU symptom and treatment factors largely featured as expected, negative psychological aspects related to mental health, emotional responses, self-perception and feelings were also well represented across studies. Social aspects were the least affected however issues pursed related to personal relationships, social interaction, leisure activities and work and study.

The most pertinent finding was that the impact on psychological functioning was often as similarly (or more impaired) than the physical aspects and in many studies physical functioning was the least impaired. Further, despite a collation of scores was not possible due to the diversity of instruments used across studies, a common pattern emerged that bio-psychosocial impairments largely concerned CU symptoms (e.g. pruritus), physical functioning/ everyday living, undertaking physical roles, energy levels, sleep, emotions/ feelings, satisfaction, mood state, work and study. Such predominantly affected areas are in line with those originally found in the key studies by O'Donnell et al. (1997), Poon et al. (1990) and Berrino et al. (2006) especially those regarding energy, sleep, emotions and work/study. The review is also in line with recent findings suggesting that health professionals do not consider the emotional aspects

of CU and this needs to be addressed (Maurer et al. 2009a. b).

CU guidelines and taskforce papers acknowledge that CU has at least psychosocial outcomes (Zuberbier et al. 2009b; Maurer et al. 2011; Baiardini et al. 2011, Weller et al. 2011) but what is often highlighted is that there are currently no CU-based psychological interventions (a gap further confirmed in this systematic review study). These particular review findings may indicate which specific impaired outcomes may arise during doctor-patient consultations that need to be targeted but this has implications for whether dermatologists have the skill set (and the additional consultation time) to help patients cope with the psychosocial aspects of CU adjunct to medical care. CU medicines may help to somewhat alleviate CU symptoms and lead to better overall bio-psychosocial functioning but the prescription of CU medicines is not an exact science (Saini, 2011; Zuberbier et al. 2009b) and can have unsatisfactory efficacy on outcome in up to 50% of patients taking them (Maurer et al. 2011). Individuals with CU may already be experiencing psychosocial issues at the point of attending their first urticaria specialist appointment hence it may take more than prescriptions of medications to help re-integrate patients back to their social and working environment. In light of these points possible areas for future direction could be to either integrate psychologists into existing services or to liaise with existing psychology services to develop referral systems for patient requiring such services.

With some conflicting evidence CU impacts quality of life independent of patient characteristics

The third main finding concerned the role of patient characteristics on QoL The systematic review findings indicated that CU relatively impacted quality of life irrespective of disease-duration, marital, educational or occupational status and the majority of studies also indicated that CU impacted QoL independent of age, gender and disease-severity/ activity however such findings were again not completely conclusive.

Age overall was not significantly related to overall QoL across studies using generic and

dermatology-specific questionnaires and in so the conflicting evidence laid within studies who administered the disease-specific CUQ_2-oL. Within these papers age was reported as unrelated to QoL in two studies (Brzoza et al. 2011; Dias et al. 2011) but a predictor of specific aspects in three others (Kocaturk et al. 2011; Mylnek et al. 2009; Yun et al. 2011). The CU-specific affected aspects did not mirror each other in these studies and this might be explained by these studies using different factor analysed versions of this instrument. For example Mylnek et al. (2009) found that older patients were more severely affected by problems with sleep, swelling and eating than younger patients who were more affected by itching/ embarrassment and daily functioning. Kocaturk et al. (2011) nor Yun et al. (2011) reported this finding with the exception of itching in the former. With the exception of Yun et al. (2011) all five studies were CU-Q_2oL questionnaire cultural adaptions and may explain cross-cultural differences in the way individuals experience aspects of QoL but only future studies using these adaptations can confirm this. Further research may also explain the high representation of patients in their mid-thirties to forties. There is a small but emerging research literature on skin disorder throughout the lifespan which includes the cumulative effects of stigmatization, physical and psychological comorbidities on life impairment (Warren, Kleyn and Gulliver, 2011) and how this plays a role in CU may be important in identifying factors that result in better outcomes.

Gender like age bore an insignificant relationship to overall QoL outcome in most studies but where significant relationships were reported women were always significantly more affected than men (Kocoturk et al. 2011; Liu et al. 2012; Maurer et al. 2009; Mynek et al. 2009; Ozkan et al. 2007; Silvares et al. 2011; Yun et al. 2011), more specifically significant relationships were to symptoms (i.e. itch, pain and vitality), appearance (e.g. embarrassment, clothing), sleep problems and physical and emotions functioning. An important point to consider if these findings are pertinent is whether these aspects are a CU-specific gender issue or a more general gender-specific issue entering into the CU domain. It is known that women with CU significantly

outnumber men by up to 4:1 as confirmed in this review but answers may lie in patients with chronic pruritus (CP) who experience the relentless itching that patients with CU experience. Stander, Stumpf, Osada, Wilp, Chatzigeorgakidis and Pfleiderer (2013) found that women had significantly more neuropathic and psychosomatic aspects underlying their CP than men which was worsened by emotional (p = .002) and psychosomatic factors (p < .05). However for pain a recent systematic review of 172 studies showed no clear differences between males and females for most types of pain (Racine, Tousignant-Laflamine, Kloda, Dion, Dupuis and Choiniere (2012a, b) suggesting a CU-specific gender factor. In terms of physical appearance the real world research literature suggests that women are more exposed to sociocultural norms to idealised appearance than men which is more ridged, homogenous and pervasive than for men (Buote, Wilson, Strahan, Strahan, Gazzola and Papps, 2011) hence in terms of the visible nature of CU this could be a possible implicating factor. Buote et al. (2011) in their literature review also highlighted that subsequently women experience significantly worse body dissatisfaction than men in general, hence the embarrassment of visible CU symptoms may add to this dissatisfaction. Further the literature suggests that women have more sleep problems than men (e.g. Nowakowski, Meers and Heimbach, 2013) so such problems might be amplified further by urticaria symptoms and explain CU-related gender differences. Of equal importance the evidence-based literature suggests that women use more emotional regulation strategies than men and ruminate more relating to significantly more psychopathology (Nolen-Hoeksema, 2012).

Indeed the above suggestions of possible determinants or mediators are merely speculative but do lead to suggestions for further research if CU-related QoL is to be understood better. Considering patient characteristics overall, more longitudinal cohort studies and focused qualitative studies may help explain why women are more affected by these variables in CU. Further, although reporting was adequate overall relationships between patient characteristics and QoL were often unreported as were reasons for patient non-participation at recruitment.

Consequently conclusions were drawn from limited data and opportunities were missed to decipher whether females suffer more CU or if males are less likely to engage with studies.

Disease-severity/ activity was the clinical factor that provided conflicting findings to QoL outcome but consistently significantly related to dermatology and CU-specific outcome but not to generic health-status and QoL. One interpretation of these findings is that CU disease severity/ activity affects the former but has not such effect on the later. Such findings may suggest, however another interpretation is that generic instruments are not psychometrically sensitive enough to capture such relationships. As stated earlier determining which questionnaire best measures CU-related QoL combining it with a standardised disease severity-activity measure may help address inconsistent findings. Current guidelines recommend the urticaria activity score or (UAS) as the gold standard (Zuberbier et al. 2009a; concerns with the recommended CU-Q_2oL were discussed earlier). Clinical factors that did impact overall QoL outcome such as presence of *helicobacter pylori* (Yadav et al. 2008), positive ASST's (Godse, 2006), concurrent angioedema (Silvares et al. 2011) and specific ones including urticaria type predicting more pruritus and impaired life activities (Dias et al. 2011) and concurrent physical urticarias to more pain (O'Donnell et al. 1997) require further investigation.

In regard to psychological and psychiatric factors the findings of the systematic review confirmed research reviewed in chapters 1 and 2 historically implicating pathological and personality determinants to CU and CU-related outcome (see section 1.2.2-3 and section 1.5.4: Anxiety and Depression). Examples included those experiencing CU with alexithymia and other personality and psychiatric disorders (clinical anxiety and depression) generally reporting worse QoL (Barbosa et al. 2011; Ozkan et al. 2007) and significant more than those with CU alone (Ugus et al. 2008; Stubach et al. 2006a). Other studies confirmed the strong relationship between both anxiety and depression as either determinants or outcome factors and QoL outcome

discussed in Chapter 2 as those studies were found by the review search strategy (e.g. Engin et al. 2007; Barbosa et al. 2011; Uguz et al. 2008). What was important about these findings was that most studies in the review did not measure such variables (especially anxiety and depression) which evidence suggests that they could be a confounding or mediating variable. Future studies may consider measuring and controlling for these variables to obtain a more accurate account of QoL in CU (or at least measure it as another outcome), but being mindful of whether these co-morbidity factors are being measured as determinants, outcomes (or bi-directional) needs to be considered as to the limitations of using screening as to diagnostic approaches. Psychosocial aspect itself to date has predominantly been measured as end-points in pharmaceutical efficacy and personality-psychiatric studies at a consequence to studying psychosocial aspects as possible determinants of outcome, however the finding by Tondury et al. (2011) suggesting that those with CU who were more cognitively flexible (open to new ways of seeing phenomena) had significantly less impaired QoL suggests more explorations of cognitive and/ or behavioural strategies that my improve outcome. *QoL worse in some aspects of CU compared to other conditions and worse than healthy controls*

One of the most important findings was the confirmation that individuals with CU experience impaired QoL similar to (and sometimes worse in some aspects) than those with other dermatological and non-dermatological conditions (e.g. O'Donnell et al. 1997; Baiardini et al. 2003). It was also unanimous that QoL impairment was also significantly worse than health controls. Such findings support that CU is not a condition to be under-estimated in terms of QoL impact and does deserve the research and clinical efforts being made to assess this important outcome in this debilitating condition, however more comparative research needs to be undertaken, especially in regard to using reference norms to the general population (e.g. Grob et al. 2005; Yosipovitch and Greaves 2008).

The most pertinent area not addressed is how QoL assessment will be integrated into clinical practice as recommended in guidelines and how the data will be utilised. Dermatology services currently adopt a bio-medical model and lack multi-disciplinary structure. Except for increasing consultation times in overstretched services CU practice risks mirroring CU research and limiting data to examining the effectiveness of dermatological treatments and not avenues for psychosocial referrals. Further much of the research has been undertaken outside of a primary care setting. This is a key concern as participants from secondary and tertiary services may present with relatively more severe disease and may not represent the CU population as a whole. In light of the methodological concerns of the included papers, which subsequently impacted the approach to data collation and analysis in this systematic, this study has nonetheless succeeded in systematically reviewing the current status of quality of life in CU and the quality of the research itself. In line with guidelines recommending compulsory CU-related QoL assessment in the absence of CU reference norms, this review will hopefully act as an accessible comprehensive summary of the literature in which both researchers and clinicians can make evidence-based decisions about patient care and resource funding.

Chapter 4

Quality of Life Measurement in Chronic Spontaneous Urticaria: A Systematic Review (Study 2)

4.0: Scope and Rationale for Study

The use of QoL questionnaires to CU research reflects its strong bio-psychosocial impact (Baiardini et al. 2011). However a pilot search of the literature highlighted that the suitability of the instruments used to measure CU-related QoL had yet to be examined. The study reported in this chapter differs from the preceding one in that it focuses on examining the adequacy of QoL questionnaires used in CU research as to the findings reported from them. This would help to establish the instrument/s sensitive enough to show relationships between representations and QoL in proceeding studies.

4.1: Introduction

4.1.1: Quality of Life Measurement in CU Research

QoL measurement in CU studies has increased since O'Donnell and colleagues first did this using the Nottingham Health Profile in 1997. However, it emerged in Study 1 that studies have consisted of different instruments making comparisons between them difficult and the term QoL has been used synonymously with similar but conceptually different terms such as health status. As the primary outcome measure of the thesis it was important to evaluate which instrument/s were the most reliable and valid to measure QoL especially in light of unresolved areas found in study 1 as to whether CU has a mild or moderate impact on QoL (which was dependent on the instrument used in studies). Existing CU reviews (e.g. Baiardini et al. 2011) only review from selected studies. Although there is currently no standardised consensus for evaluating QoL questionnaires in skin disorder there is a general agreement in the literature of what constitutes a good one (Augustina, Amonb, Bullinger, Gielerd et al. 2000; Basra et al. 2008; Both et al. 2007; de Korte et al. 2002; Finlay, 2005; Halious, Beumont and Lunel, 2000; Van Beek et al. 2007). The current review created a framework based on these sources and guidelines for culturally adapting instruments (Eremenco, Cella and Arnold, 2005; Swaine-Verdier, Doward, Hagell et al. 2004).

4.1.2: Review Question and Objectives

Review Question: In CU which questionnaires are most valid and reliable in measuring quality of life?

Review Objectives: To (I) overview the variety of QoL questionnaires being used in CU research; (II) critically review the psychometric properties of these questionnaires and (III) evaluate which measure/s are the most adequate for CU-related QoL research.

4.2: Method

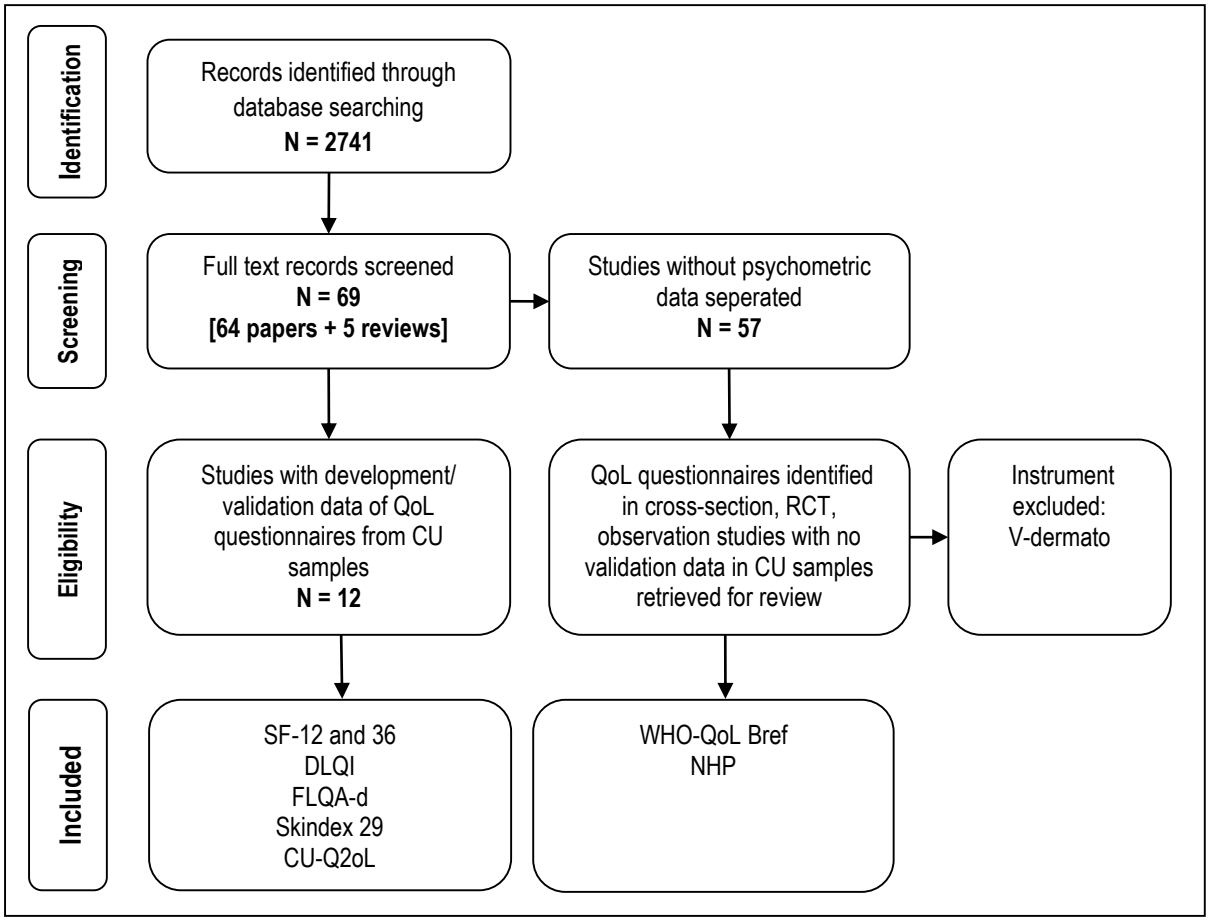
4.2.1: Identification of Studies

The search strategy used was identical to Study 1 and can be found in section 3.2.1 (p54) of Chapter 4 however the aim here was only to include papers that were exploring the development and psychometric properties of QoL instruments in individuals with CU. If development and psychometric information was being collected from a revalidation paper (i.e. validating CU samples to an already existing questionnaire) the original development paper were still retrieved to obtain more information on development and construction.

4.2.2: Study Selection Criteria

Studies were included if they contained questionnaire development, psychometric and cultural adaptation data of multi-dimensional questionnaires and consisted of participants with a primary diagnosis of chronic urticaria and were in English. Culture-specific questionnaires were excluded, as primary physical urticarial samples. If the main assessor (DB) was uncertain about what papers to include this was discussed to a consensus with a second assessor (JK) who was a PhD researcher at the same academic institution. The selection process can be found in Figure 4.1 (p99).

Figure 4.1: Flowchart of Election Process of CU Papers using QoL Questionnaires



4.2.3: Data Extraction

The criterion for data extraction was based on the references reported in section 4.1.1 (p97) for what constitutes a valid and reliable QoL questionnaire in dermatology. Data was extracted on the areas listed below which are described further in Appendix 2 (pA5) with a copy of the see data extraction.

Part 1: General Questionnaire Information

Name; Type; Authors; Language; Original population

Part 2: Questionnaire Construction: Description and Feasibility

Development: (a) Measurement goals; (b) questionnaire item generation (c) Item reduction

Description: Items/ domains; response scale; scoring; timeframe

Feasibility: Patients understanding; completion time

Validation Study: Total sample: structural validity and internal reliability

Part 3: Psychometric Properties

Reliability: Internal; Test-retest **Validity**: Content; Construct; Convergent; Discriminant

Responsiveness & Clinically Significant Change (CSC)

Part 4: Cultural Validation: Translation

4.3: Results

4.3.1: Study Selection Process

From the 53 studies included in the search strategy undertaken in Study 1, only twelve included development and psychometric data and/ or information on QoL instruments in CU. These were as follows: Augustin et al. 2000, Baiardini et al. 2005; Brzoza et al. 2011; Dias et al. 2011; Kocaturk. 2011a,b; Lennox and Leahy, 2004; Liu et al. 2012; Mylnek et al. 2008, 2009; Shikar et al. 2005; Spector et al. 2007 and Valero et al. 2008). The French culture-specific questionnaire V-Dermato was excluded.

4.3.2: General Review

1. General Questionnaire Information

From the 12 included studies, 8 instruments were accepted by the inclusion criteria and this consisted of 4 generic, 3 dermatology-specific and 1 disease-specific questionnaire/s. Generic measures included the short form health surveys SF-12 (Ware et al. 1996) and SF-36 (Ware and Sherbourne, 1992), the NHP (Hunt et al. 1985) and the WHOQoL-BREF (WHOQoL Group, 1998b). Dermatology-specific measures included the Skindex-29 (Chen et al. 1997), the DLQI (Finlay and Khan, 1994) and the FLQA-d (Augustin et al, 2000). The disease-specific instrument was the CU_2QoL (Baiardini et al. 2005). The developmental origin of instruments was predominantly American and European with exception to the multi-centred WHOQoL-BREF but total languages available per instrument ranged from 6 for the CU-Q_2oL to 50 plus for both the SF-36 and DLQI respectively.

2. Questionnaire Construction

CU samples in original QoL instrument construction was restricted to the original Italian disease-specific CU-Q_2oL and its cultural validated versions; hence they did not feature in the original development of all generic instruments and were only included in the original development of the dermatology-specific FLQA-d. Generic and dermatology-specific instruments predominantly featured to help inform the construct validity of the CU-Q_2oL (i.e. SF-36, Skindex-29, and DLQI) and only one were formally validated in individuals with CU for the first time (i.e. DLQI). No revalidation featured of generic

instruments in CU (i.e. SF-36, NHP, WHO-QoL Bref). The most common validation technique of an existing instrument was via exploratory factor analysis (EFA). Development and descriptions for generic and dermatology-specific instruments used in CU are presented in Table 4.1 (p102).

Measurement Goals, Items, Generation and Reduction

CU samples were involved in 2 papers related to the development of a new QoL instrument (i.e. the Italian CU-Q_2oL and FLQA-d). Both papers reported the measurement goals, study purpose, and target populations. In both, item generation was undertaken in conjunction with patients and experts including dermatologists, allergists and psychologists. Even though CU samples were not involved in the original development of the other instruments, information on their construction was well documented. Generally item generation was undertaken by experts only for generic measures and with patients for dermatology-specific ones. Item reduction involved patient piloting and statistical analysis.

Description, Feasibility and Validation Study

Items for QoL questionnaires varied greatly ranging from 10 for the DLQI to 53 for the FLQA-d. As expected generic measures tended to focus on QoL aspects that were not necessarily related to health and specific measures allowed for more items that affected skin diseases in particular. Items were themed into domains that ranged from 3 for the Skindex-29 to 8 for the SF-36 but all instruments covered bio-psycho-social aspects of QoL to varying levels of focus. All measures were designed for self-report and participants were expected to respond on mainly continuous 3-5 point Likert scales but could be administered in other formats (e.g. 1-2-1 interview). The majority of instruments were constructed to produce a domain (e.g. Skindex-29, CU-Q_2oL) or summary score (SF-26) but could also be transformed to allow for an overall score. The timeframe for measures ranged from 1 week for the DLQI and FLQA-d to 4 weeks for the Skindex-29 and completion times varied widely depending on the amount of items (2 minutes for the DLQI and SF-12 to 10 minutes for the generic SF-36 and NHP). The number of patients with CU involved in validation ranged from 47 for the FLQA-d to 857 for the DLQI.

Table 4.1: QoL Questionnaires- General Information, Development, Description and Feasibility

1. General Questionnaire Information		2. Construction	Description			Feasibility	Validation Study
Name/ abbreviation/	**Language/ Translations**	**Development**	**Items/ Domains**	**Response**	**Score/ Time Frame**	**Patient Understanding/ Completion Time**	**CU Sample size**
Generic Instruments							
World Health Organisation Quality of Life Questionnaire (WHO-QOL BREF)* WHOQOL Group (1998b)	**Original** Multiple- 18 countries **Translations/** Yes **Original sample**	**Measurement Goal:** To develop a reduced version of the WHOQOL-100, a QoL tool developed to be cross-culturally applicable. **Purpose:** Evaluation/ Discrimination **Item Generation:** Experts **Item Reduction:** Experts and patients	**Items:** 26 **Domains:** 4 Physical Health, Psychological, Social Relationships, Environment 1 facet on 'overall QoL' and 'general health'	Continuous Scale 5 point Likert 0-100 Higher scores = poorer outcome	By domain 2 weeks	Not reported	**CU in Sample:** None
Medical Outcomes Study 36-Item Short-Form Health Survey (SF-36)** Ware and Sherbourne (1992)	**Original** USA **Translations/** Yes **Original sample**	**Measurement Goal:** To develop an health survey tool for clinical & epidemiological research **Purpose:** Evaluation/ Discrimination **Item Generation:** Experts **Item Reduction:** Experts	**Items:** 36 **Domains:** 8 Physical Functioning, Role Limitations (Physical), Bodily Pain, General Health, Vitality, Social Functioning, Role Limitations (Emotional), Mental Health, Single item on 'change in health''	Continuous 3-5 Likert scales for items 1-3 & 6-11 Dichotomous for items 4-5 0-100 transformed scale: Higher scores= better outome	By domain 2 summary scores Physical component (PCS) & Mental component (MCS)	4 Weeks (Except 1 year for general health item) 7-10 minutes	**CU in Sample:** None

Table 4.1 Continued

General Questionnaire Information		Construction	Description			Feasibility	Validation
Name/ abbreviation/	**Language/ Translations**	**Development**	**Items/ Domains**	**Response**	**Score/ Time Frame**	**Patient Understanding/ Completion Time**	**CU Sample size**
Medical Outcomes Study 12-Item Short-Form Health Survey (SF-12)*** Ware, Kosinski and Keller (1996)	**Original** USA **Other** Yes	**Original sample:** **Purpose:** Evaluation/ Discrimination **Measurement Goal:** To develop a reduced version of SF-36 for use in large scale epidemiological and clinical research **Item generation:** Experts **Item reduction:** Experts	**Items:** 12 **Domains:** 8 2 items each from SF-36's Physical Functioning, Role Limitations (Physical), Role Limitations (Emotional), Mental Health 1 item each from SF-36's Bodily Pain, General Health, Vitality, Social Functioning,	Continuous on items 1-3 & 8-12 3-6 point Likert Dichotomous on Q. 4-7, No-Yes 0-100 scale transformed: Higher scores better outome	Domain/ 2 summary scores Physical component (PCS) & Mental component (MCS) 4 Weeks	2 minutes	**CU in Sample:** None
Nottingham Health Profile (NHP)**** Hunt, McEwen and McKenna (1985)	**Original** UK **Other** Yes	**Original sample:** **Purpose:** Evaluation/ Discrimination **Measurement Goal:** To develop an epidemiological population based survey tool to assess perceived health status **Item generation:** Patients **Item reduction:** Patients	**Items:** Part 1: 38, Part 2: 7 statements **Domains:** 6 (part 1) Sleep, Physical Mobility, Energy, Pain, Emotional Reactions, Social Isolation Part 2 statements: paid employment, domestic activities, social life, personal relationships, sex life, hobbies and interests, holidays	Dichotomous Yes- No 0-100% of sample response Higher % poorer % outcome	Domain Not reported	5-10 minutes	**CU in Sample:** None

Table 4.1 continued

General Questionnaire Information		Construction	Description		Feasibility	Validation Study	
Name/ abbreviation/	**Language/ Translations**	**Development**	**Items/ Domains**	**Response**	**Score/ Time Frame**	**Patient Understanding/ Completion Time**	**CU Sample size**
Derma-Specific							
Frieburg Life Quality Assessment - dermatology (FLQA-d)*** Augustin, Zschocke, Seidenglanz et al. (2000)	**Original** German **Other** Not found	**Measurement Goal:** To design a QOL tool that has both generic & disease-specific components for chronic skin disease allow comparison with acute & healthy populations also **Purpose:** Evaluation/ Discrimination **Item generation:** Patients and experts **Item reduction** Patients and experts	**Items:** 53 (40 general, 10 specific) 3 visual analogue scales (VAS) **Domains:** Physical Complaints, Everyday Life, Social Life, Emotional Status, Treatment, Satisfaction VAS: General health, Skin condition, QoL	Continuous 5 point Likert 0-112 Higher scores= poorer outcome	Domain & Composite	1 Week Not reported	**CU in Sample:** Yes 45 of 747
SKINDEX-29**** Chren, Lasek, Quinn et al. (1997)	**Original** US **Other** Yes	**Measurement Goal:** To improve the 61-item Skindex, a tool developed to measure the patients perceived effects of skin disease on QOL **Purpose:** Evaluation/ Discrimination **Item generation:** Research literature, experts and patients **Item reduction** Patients and experts	**Items:** 30 (29 assigned to scales, item 18 separate) **Domains:** 3 Emotions, Functioning, Symptoms	Continuous 5 point Likert 0-100 higher score= poorer outcome	Domain (ideally)	4 weeks 5 minutes	**CU in Sample:** None

Table 4.1 continued

General Questionnaire Information		Construction	Description		Feasibility	Validation Study	
Name/ abbreviation/	**Language/ Translations**	**Development**	**Items/ Domains**	**Response**	**Score/ Time Frame**	**Patient Understanding/ Completion Time**	**CU Sample size**
Dermatology Life Quality Index (DLQI) ******* Finlay and Khan (1994)	**Original** UK **Other** Yes	**Measurement Goal:** To develop a compact tool applicable to all skin disease for routine clinical practice **Purpose:** Evaluation/ discrimination **Item generation:** Patients **Item reduction** Patients and experts	**Items:** 10 **Domains:** Symptoms & feelings, daily activities, leisure, work/ school, personal relationships, treatment	Continuous 4 point Likert (8 questions have a 'not relevant, option) 0-30 (or % proportion of smaple) Higher score/ % = poorer outcome	Composite (often summed by domain but evidence suggests instrument as one-dimensional)	1 week 1-3 minutes	**CU in Sample:** None

3. Psychometric Properties

A summary of generic and dermatology-specific QoL instrument development and psychometric properties in CU samples can be found in Table 4.2 (p107). An observation of Table 4.2 clearly shows that no factor analytical techniques or psychometric testing was reported for generic instruments in CU but this was available for dermatology-specific instruments. These will be discussed in further detail in the more specific individualised review of the instruments in Section 4.3.3.

Reliability

All questionnaires validated in CU (FLQA-d, DLQI and CU-Q_2oL) showed good internal consistency with Cronbach alphas above .7 in most instances and test-retest reliability were also good across instruments. Test-retest reliability correlations ranged from .68 (FLQA-d) to .91 (DLQI).

Validity

Even though the generic SF-36 and dermatology-specific Skindex-29 was not formally validated in CU populations they played a role in the convergent validation of the disease-specific CU- Q_2oL demonstrating good levels for equivalent items and/ or domains. The DLQI also showed good convergent validation when correlated with the FLQA-d and most versions of the CU-Q_2oL. In full validation studies patients with CU where generally involved in the content validation process and discriminant validity was always demonstrated to be of a mild to moderate magnitude where reported.

Responsiveness and Clinical Significant Change

All instruments validated in CU (FLQA-d, DLQI and CU-Q_2oL) showed responsiveness in virtually all domains with significance levels ranging from p <0.05 in the Italian CU-Q_2oL to p <0.0001 or more for the Brazilian-Portuguese and Turkish versions. Clinical significant change (or minimal important difference) information was only available for the DLQI (Shikar et al. 2004).

Table 4.2: Validation of Generic & Dermatology-Specific Instruments

Instrument	Construction	Validation	Psychometric Properties			
Abbreviation	**Item Reduction/ Factor Analysis**	**CU Sample**	**Reliability**	**Validity**	**Responsiveness**	**Clinical Sig. Change**
Generic						
WHO-QOL BREF	NR	None	NR	NR	NR	NR
SF-36*	NR	None	NR	Good Convergent validity with equivalent CU_2QoL items or domains in the validation of original Italian version of CU_2QoL	NR	NR
SF-12**	NR	None	NR	NR	NR	NR
NHP	NR	None	NR	NR	NR	NR
Dermatology						
FLQA-d***	NA (see Table 5.1)	45 from 747	**Internal reliability:** All α>0.8 (except treatment 0.69) **Test-retest:** Pearson r 0.68 to 0.91	**Content:** Yes (patients/ experts) **Convergent**: Yes: Good to strong convergent validity with relevant DLQI domains **Discriminant:** Yes. Differed on 5/6 of scales with psoriasis & atopic dermatitis patients. All received the same treatment reflected in no change on 6th scale	Good sensitivity to change. All scales <0.0001	Not reported

KEY: NR Not Reported, NA Not applicable, *SF-36: Baiardini et al (2005), ****SF-12**: Reeves et al, 2004,*****FLQA-d** Augustin et al, 2000

Table 4.2 Continued

Instrument	Construction	Validation	Psychometric Properties			
	Item Reduction/ Factor Analysis	**CU Sample**	**Reliability**	**Validity**	**Responsiveness**	**Clinical Sig. Change**
Skindex-29****	NR	None	None	Good convergent validity with equivalent items & domains of the CU_2QoL (German, Polish, Turkish & Spanish versions).	NR	NR
DLQI*****	Factor analysis showed a uni-dimensional structure in one USA study supporting the use of a total score but a two-factor structure in Chinese sample.	163 to 857 (944 for MID study)	**Internal reliability:** Average overall score α>0.8 in studies assessing this. Distribution analysis showed items were free from floor and ceiling effects) **Test-retest:** Spearman rank correlation between scores 0.99 (P<0.001)	**Content:** Yes**,** using the item response model **Convergent**: Yes. Converges well with tested items and/ or domains of the FLQA-d, CUQ_2oL (Brazilian-Portuguese, German, Polish, Spanish and Turkish versions). **Discriminant:** Moderate discriminating power reported in differentiating patients with high or low QoL except item 1 (symptoms).	Scores reported to be in line with other clinical changes in patients	MID of between 2.24-3.10

Skindex-29**:** Brozaet al, 2011, Kocaturk et al, 2011a, Valero et al, 2008, Mylnek et al, 2009,
DLQI***** Augustin et al, 2000; Brzoza et al, 2011; Dias et al, 2011; Kocaturt et al, 2011a, Lennox & Leahy et al, 2004; Liu et al, 2012; Mylnek et al, 2009, 2008; Shikar et al, 2005; Spector et al, 2007 Valero et al, 2008

4. Cross-Cultural Adaptations

CU samples were used in the cultural adaptation of one instrument, the disease-specific CU-Q_2oL (see Table 4.3, p120). In these five studies (Brzoza et al. 2011; Dias et al. 2011; Kocaturk et al. 2008; Mylnek et al. 2009; Valero et al. 2011) the full validation process was comprehensively described with the use of factor analysis to the use of standardised forward and back translation techniques to convert instruments from the original Italian version. Even though cultural adaptations did exist for other instruments in this review, the involvement of patients with CU was not identified.

4.3.3: Instrument Review 1: Generic Instruments

WHO Quality of Life Questionnaire- Brief (WHOQoL-BREF)

The WHOQoL-BREF (WHOQoL Group, 1998b) is an abbreviated version of the WHOQoL-100 and reflects the philosophy of its original, which was to create a cross-culturally applicable instrument developed to a consensus across 15 international WHO-QoL Group centres. By deciding on the facets most important in assessing QoL, 236 items were generated and piloted on 300 individuals with a range of health problems. The development of the WHOQoL-100 is presented elsewhere (WHOQoL Group, 1994, 1998a) and the present review will focus on the WHOQoL-BREF. The WHOQoL-BREF was developed because the WHOQoL-100 was deemed too long for some larger epidemiological studies or studies using multiple measures. It correlates significantly well on all domains of the WHOQoL-100 and exhibits good psychometric properties in its original test populations.

The 26-item WHOQoL-BREF retained the 4 domains of its original (physical, psychological, social and environmental). The reduced items selected within each domain represent at least 1 item that best explained the largest variance in the original WHO-QOL 100 domain, hence is representative of the original domain (this principle was also used in the single statements of overall QoL and general health perceptions). Patients self-report on a 5-point scale and a score of 4 to 20 can be given per domain. Domains are scored by multiplying the mean items by 4 and higher scores indicate better QoL.

The use of the WHOQoL-BREF is relatively new in skin research and from the findings of this review has not been psychometrically tested in CU samples in any aspect making evaluating its adequacy for CU research difficult to establish at this moment in time. The WHOQoL-BREF has been reviewed to be a promising instrument in skin disease research (Both et al, 2007) but its relatively limited use in CU research (reflected in 2 cross-section studies in Chapter 3) suggests that validation in CU populations is required to establish its benefits over other generic instruments and further usage in CU-related QoL studies is needed to reach a consensus on its performance.

The Medical Outcomes Short-Form Health Surveys (SF- 36, SF-12)

SF-36

The SF-36 (Ware and Sherbourne, 1992) was created as an improvement to the previous SF-20. The purpose of its development was not only to bridge a gap between the long, time consuming existing measures in general health surveys but also to improve the content and construct validity of the SF-20. The developers selected items from previously published questionnaires over the previous 20-40 years resulting in a comprehensive psychometrically evaluated questionnaire designed to measure health in the Medical Outcomes Study (MOS) across disease samples. It is available in many languages and administration formats and correlates well with the SF-20.

The 36-item SF-36 consists of 8 scales (see Table 4.1) determined by factor analysis that can be summed up into a mental component (MCS) or physical component (PCS) score. Participants report on a continuous scale (except for 2 dichotomous responses) and a score of 0-100 is given per domain. Higher domain or summary scores designate better health status. It requires 7-10 minutes to complete and patients report feelings over the past 4 weeks (except 1 year for general health item). The measure is recommended for use in epidemiological and clinical research in specific and general populations.

The SF-36 is widely used in skin research (Both, 2007) but like the WHO-QoL-BREF appears to lack any formal validation testing in CU populations making an evaluation of its psychometric performance

limited. However the SF-36 was used in the convergent validation of the original version of the disease-specific CU-Q_2oL. Associations were found in the authors predicted directions where higher statistically significant correlations where found between conceptually similar domains. One example included patients reporting lesser symptoms and better QoL on the CU-Q_2oL also reported better health status on the SF-36.

The SF-36 is often recommended as the reference measure in both skin disease and general research and demonstrated above its sensitivity to detect differences in CU and other populations on its scales. It also has themes around positive health, lacking in some questionnaires. Even though this is the case a few concerns arose. As its developers point out the SF-36 does not account for factors such as sexual functioning, cognitive functioning, family functioning and sleep. From this review it appears that the SF-36 should be accompanied with a more specific measure to capture the full CU-related QoL experience and the preliminary evidence suggests that it may work well with the CU-Q_2oL.

SF-12

The SF-12 (Ware, Kosinski and Keller, 1996) was developed because the SF-36 was deemed too lengthy for some larger scale research studies. It was required to not only be capable of explaining a minimum of 90% of the variance in the MCS and physical PCS of the SF-36, but also give comparable scoring patterns across its items and domains with a 2 minutes self-administration time. From previous results it was known that the MCS and PCS of the SF-36 provided evidence suggesting that it was psychometrically possible to reduce items without compromising comprehensiveness. They used SF-36 data to perform validity tests to select and score items.

Available in many languages, the SF-12 retains the same components and 8 domains of the SF-36 but has 12 items (where 10 items replicate the MCS and PCS equivalents of the SF-36 without compromising completeness (6 of the domains) and 2 new added items to represent the remaining 2 domains). Eight questions are answered on a continuous scale with the remaining providing dichotomous

response options. With a timeframe of 4 weeks higher scores mean better QoL. The SF-12 did explain 90% of the variance in the SF-36 and could draw upon similar statistical conclusions but a 10% decreased discrepancy in its validity coefficients was reported. This suggested that the SF-12 did not affect large group studies but would when used with small numbers or individuals. Large mean score differences of both measures were reported suggesting further caution when using the SF-12 as a shorter alternative.

The review found no validation data undertaken in CU samples and in Study 1 it only featured as a secondary measure in a CU drug efficacy RCT study (Reeves et al. 2004). Its current lack of psychometric evaluation in CU suggests that the full version (i.e. the SF-36) appears to be a more recommendable option, however if successfully validated it would reduce respondent completion time.

Nottingham Health Profile (NHP)

The NHP (Hunt, McEwen and McKenna, 1985, 1986) was designed for health survey research. At the time of its development the authors believed that existing measures suffered from several issues. They were long, complicated, ambiguous, biased to the physician's point of view, narrowly focused and resulted in composite scores limiting the analysis of specific areas (Hunt et al. 1985, 1986). The objective of the NHP was to produce a questionnaire good enough for use in both general populations and chronically ill groups. Around 2200 statements were collected from over 700 individuals describing the effects of bio-psycho-social aspects of their health. After testing in different patient groups, the NHP was created. The result was a 2-part health profile, part 1 containing 38 statements divided into 6 domains (i.e. sleep, mobility, energy, pain, emotional reactions, social isolation) and part 2 containing 7 statements relating to everyday life on a dichotomous scale (see Table 4.1, p103). With a completion time of 5-10 minutes, scores range from 0-100 per domain where higher scores mean worse health status.

The NHP has been psychometrically tested successfully in diverse patient populations and was used in the break-through study that highlighted the impact of CU on quality of life (O'Donnell et al. 1997) however it has not been psychometrically evaluated in CU samples. The social domain is also limited

and its cross-cultural adaptation is not well established outside the UK (Both et al. 2007). Further the author's of the NHP state that using the seven extra statement items on top of the 6 NHP domains might become '*cumbersome*' when multiple factors are being analysed. In terms of CU research this is particularly pertinent as CU researchers in clinical trials often use many other diagnostic and clinical measures in addition to quality of life in their studies and this may increase both participant burden in terms of completion time and the need to account for the extra variables in data analysis. The authors also note that the NHP represents rather severe problems so may not be sensitive to participants with milder health conditions. It seems clear that further psychometric testing of the NHP in CU is required.

4.3.4: Instrument Review 2: Dermatology and Disease-Specific Instruments

Freiburg Life Quality Assessment- Dermatoses (FLQA-d)

The FLQA-d (Augustin et al. 2000) presented in 1 paper is a variant of several HRQoL questionnaires developed from the FLQA (Freiburg Life Quality Assessment). The aim was to create a HRQoL questionnaire that contained both generic and disease-specific components. The authors argued that current dermatology-specific measures were adequate for assessing QoL but that they lacked specificity for certain conditions. The FLQA-d was developed using CU, psoriasis and atopic dermatitis patients and experts in dermatology, psychology and statistics. Patients were asked to write down the most frequent problems experienced and presented with further questions (not stated). Responses were piloted in 26 patients before the new disease-specific items were added to the existing general FLQA. The 53-item FLQA-d consists of 40 generic and 10 specific items assigned to 6 a-priori scales plus 3 visual analogue scales. Patients respond on a continuous 5-point Likert scale where higher scores equal lower HRQoL within a 1 week timeframe and responses are analysed by domain (Augustin et al. 2004).

The FLQA-d validation involved 747 dermatology patients where 47 had CU. Psychometric testing established good distribution characteristics across domains except for moderate floor and ceiling effects for the *social life* and *treatment* domains. All domains showed good internal reliability with

Cronbach alpha's at >0.7 (except *treatment* at 0.69). Test-retest reliability was good at >0.8 overall ranging from 0.68 for satisfaction to 0.9 for everyday life. The Questionnaire for chronic skin diseases (QCSD), Questionnaire on everyday life and the DLQI were used to assess convergent validity where significant correlations were found between the FLQA-d and comparable scales (e.g. FLQA-d emotional status with QCSD anxious-depressive mood). Discriminant validity was assumed as groups differed in five of the FLQA-d six scales and when compared to healthy controls. The FLQA-d demonstrated good responsiveness to change with all domains showing substantial significance ($p< 0.0001$). Even though the FLQA-d is one of the only instruments to include CU, it has not been used in CU samples outside of its development paper in 2000 and is rarely used in dermatology in general (Both et al. 2007).

Dermatology Life Quality Index (DLQI)

The DLQI (Finlay and Khan, 1994) is a controversial choice for inclusion in that its status as a multidimensional instrument is often challenged (Basara, et al, 2008; de Korte et al, 2002) but it is the most used instrument in skin QoL research (Both et al, 2007) and was involved in over 50% of the included papers in Study 1 and the convergent validity of virtually all instruments in this Study.

The authors of the DLQI acknowledged that using disease-specific measures in dermatology did not allow for comparisons with other skin conditions and that many general measures at the time were too lengthy for routine clinical use. The aim was to develop a simple assessment tool applicable to all dermatology patients. They asked 120 patients attending their dermatology department to write down "…*all the ways that your skin disease affects you*". This resulted in 49 items categorised and ordered by frequency of mentions. The chosen 10-items were piloted twice to confirm comprehensiveness and feasibility and subjected to preliminary tests in 200 patients and 100 controls with further validation testing in 53 patients. The result was the 10-item instrument with 6 '*suggested*' domains. With a timeframe of 1 week and completion time of 1-3 minutes, patients report on a 4-point Likert scale (note: 7 items have a *not relevant* option and item 7 is dichotomous). Scores range from 0-30 where higher scores mean poorer

QoL and are ideally scored compositely. Of the 32 skin diseases in its development, no CU samples were involved but data on its psychometric properties could be extracted from all but one of the included studies.

Lennox and Leahy (2004) used data from 2 CU-related RCT studies to see if the DLQI would present with similar psychometric properties as the original 1994 paper. In CU the DLQI showed good item distribution, free of floor and ceiling effects. Internal reliability for all items exceeded Cronbach's alpha of 0.7 with exploratory and confirmatory analyses of >0.6 suggesting a 1 or 2 factor structure (except 0.37 for item 1 which still exceeding the original 0.3). Using the item response model to establish content validity, the DLQI showed a moderate magnitude and the ability to discriminate across different levels of QoL on all but 1 item. Construct validity was significantly different with discriminant validity correlations falling between 0.21-0.37 between DLQI and other study outcomes. As DLQI scores where in line with clinical changes in patients, this indicated sensitivity to clinical changes. Further one RCT study reported full psychometric performance data of the DLQI in CU (Spector et al, 2007), which mirrored Lennox and Leahy (2005) for internal consistency reliability (Cronbach alpha 0.87) and validity. This was also true for the DLQI's ability to detect therapeutic changes over time providing further evidence of its ability to differentiate between different groups/ levels of outcome, responsiveness and sensitivity to clinical change. Despite this responsiveness Mylnek et al. (2008) in their clinical observation found that the DLQI correlated weakly with measures of disease activity including the UAS. Shikiar et al. (2005) in another study estimated the DLQI's minimal important difference score to be between 2.24 to 3.10 to be used to establish a meaningful perceived change in patients. In the remaining validation studies the DLQI was used in the convergent validity of the FLQA-d and the Brazilian-Portuguese, Polish, Turkish, German and Spanish versions of the CU-$_2$QoL which indicated strong convergence with conceptually equivalent items.

The DLQI has a good record in CU research and unlike other measures it has been substantially validated in CU using large sample sizes, however evidence for its one-dimensionality (Basra et al. 2008;

Lennox and Leahy, 2005) means studies that report this instruments results by the suggested (not factor analysed) domains may be misleading in terms of evaluating what are meant to be multi-dimensional aspects of QoL. Liu et al. (2012) confirmed the possibility of a two-factor structure but this is still not in line with the suggested domains by its authors. However in routine care practitioners may prefer the ease of its composite score. Another limitation of the DLQI is that it also focuses more on disability and its popularity may lie in its quick administration time to patients, especially when many other factors are being assessed. Despite the popularity of the DLQI as the most used QoL instrument in dermatology (Basra et al. 2008) and its strong psychometric properties in CU it still remains a measure of disability not QoL (Both et al. 2007; DeKorte et al. 2002) hence it is not statistically tapping into the latent aspects it claims to explore.

Skindex-29

The Skindex-29 (Chren, Lasek, Quinn et al. 1997) is a revised version of the 61-item Skindex (Chren et al. 1996). It was recognized that the 15-minute completion time of the original increased patient burden and restricted its routine usage in research and practice (Chren et al. 1997). Further issues included its contentious evaluation and discrimination qualities and lack of responsiveness. On observing that many patients chose the same answers for many items 70% of the time, the objective was to address these issues.

Using data from the Skindex-29 development study undertaken in a dermatology clinic and private practice, the authors analysed the most psychometrically sound Skindex items. After items were retained, reworded and generated the new measure was psychometrically tested. Factor analysis of the new items reflected domains more comprehensively, while reworded items allowed for better group discrimination. This resulted in a 30-item instrument with 3 domains. With a 4-week timeframe and 5-minute completion time, patients respond on a 5-point scale where a score of between 0-4 is given. Higher scores indicate greater impact on QoL and are summed as domain scores. Even though the Skindex-29 has been extensively tested and has shown good psychometric performance in skin disease

populations, only 4 patients with urticaria were involved in its original development and the urticaria type was unreported and its CU validation was limited to use in the convergent validity of other instruments. It was used in the cultural validation of the Polish, German, Spanish and Turkish versions of the CU-Q_2oL showing strong convergent validity however it has also shown evidence of some item redundancy with the CU-Q_2oL.

Chronic Urticaria Quality of Life Questionnaire (CU-Q_2oL)

The CU-Q_2oL (Baiardini et al. 2005) was designed to measure QoL in individuals with CU. The authors observed the number of QoL studies available for other skin conditions and identified a number of concerns: (i) the lack of CU-QoL studies (ii) studies focusing mainly on clinical endpoints, (iii) common usage of general or dermatology-specific instruments because a disease-specific one did not exist. They believed that using generic measures because a specific one did not exist was unacceptable and that they might not be sensitive enough to detect concerns and changes over time. The aim of the paper was to develop a disease-specific measure and to evaluate its psychometric properties. The 23 items of the measure were generated in conjunction with 60 CU patients and experts in dermatology, immunology and allergy. A factor analysis identified a 6 dimensional structure explaining 60.0% of the variance in the sample. It takes 5 minutes to complete and patients answer questions on a 5-point Likert scale where higher domain scores (10-100) equals poorer QoL.

Psychometric testing established good internal reliability for all domains exceeding a Cronbach alpha of 0.7 at group level (exception swelling at 0.65). Test-retest reliability (via ICC) was scored at 0.75 for the majority of items. Completion of the SF-36 and CU-Q_2oL in 125 patients showed good convergent validity where associations were in the expected directions with equivalent domains correlating with each other (examples are included in the SF-36 review above). Its responsiveness was found to be significant in 18 of 23 items and was significant for expected changes in disease severity on all scales. The CU-Q_2oL was concluded to be a reliable and valid measure for assessing QoL in CU and recommended for use in treatment assessment and decision-making by its authors.

As highlighted in the current study so far and Table 4.3 (p120), the CU-Q_2oL has been comprehensively and successfully translated and validated into five further languages. All versions have reported high levels of internal consistency but not all have successfully replicated the factor structure of the original version by Baiardini et al. (2005) as can be observed in Table 4.3. (p120) Dispite the differing factor stuctures of the cross-culturally validated versions of the CU-Q_2oL all have shown strong convergent validity with the Skindex-29. In a first example Valero et al. (2008) in their Spanish version found that the domains of *pruritus* and *swelling* significantly correlated with the Skindex-29's *symptoms* scale (>0.60) and the CU-Q_2oL *impact on daily activities* and *limits* domains significantly correlated with Skindex-29's *functioning*. In a second example Mylnek et al. (2009) in their German version found a strong convergent validity between the CU-Q_2oL *functioning* scale and the Skindex-29 *functioning* scale, the CU-Q_2oL *sleep* scale with the Skindex-29 items 2 (*sleep*) and 30 (*tired*) and the CU-Q_2oL *mental status* scale with Skindex-29 *emotions* scale. Further, as already examined earlier the original Italian CU-Q_2oL converged well with the SF-36, which is the only generic instrument to be tested in a QoL instrument validation study.

The CU-Q_2oL is a welcomed new addition in CU research that has had to rely on generic and dermatology-specific instruments that do not cover items such as swelling. As it covers areas that are specifically relevant to patients with CU it should be more sensitive in identifying the bio-psychosocial needs of these patients in clinical practice (i.e. helping in the treatment and decision making process) and when used longitudinally in medical and psychosocial interventions.

When used alone the advantages and disadvantages of using a disease-specific measure should be balanced between the patient's acceptance of them and the alternative use of a generic or dermatology-specific measure. Ideally it should be used with a generic-instrument to assess areas not covered in disease-specific instruments and to allow for cross-disease comparision to non-dermatological conditions to support that CU equally impacts QoL when evidence base grant applications are being proposed. The only cravat of this instrument is in the different variations being published in the literature.

Table 4.3: Versions of the Chronic Urticaria Quality of Life Questionnaire: Development and Psychometric Properties

General	Construction	Description & Feasibility	Psychometric Properties			Cultural Validation
Reference **Language**	**Development** **Validation Sample size**	**Items/ Domains** **Response Score/Time Frame**	**Reliability**	**Validity**	**Responsiveness**	**Translation**
Baiardini et al. 2005 Italian original	**Sample size:** 76 Development, 125 validation (> 60% female) **Measurement goal:**To develop the first disease-specific tool able to capture bio-psychosocial & practical aspects of HRQoL in CU **Purpose:** Evaluation/ Discrimination **Item generation**: Experts& Patients **Item reduction:** Experts& Patients	**Items:**23 **Domains:**6 1. Pruritus, 2. Swelling 3. Impact on Life Activities 4. Sleep Problems 5. Looks 6. Limits **Response**5 point Likert/ **Score:** Domain* **Timeframe:** 15 days **Understanding:** NR* **Completion time:**5 minutes*	**Internal reliability:** All Cronbach α between 0.5-0.7 for all domains **Test-retest** ICC = >0.4 and <0.75 for items physical activity, social relationships, falling asleep', bad mood. Other items 0.75 or greater.	**Content validity:**Yes **Convergent**: Yes, Correlates well with equivalent SF-36, Skindex-29 & DLQI domains. **Discriminant:**NR	**Responsiveness** After 2/3 weeks highly significant responsiveness in18/ 23 items (p < 0.05 on all items).	Not applicable
Brzoza et al. 2011 Polish	**Sample size:** 126 (70.6% Female) **Measurement goal:** To adapt a Polish version & provide initial results. **Purpose:**Evaluation/ Discrimination **Item reduction:** Statistical (factor analysis)	**Items:** 23 **Domains:** 6 1. Itching 2. Swelling/ mental status 3. Functioning 4. Sleep 5. Eating/limits 6. Embarrassment	**Internal reliability:** Cronbach alpha all > .7 **Test-retest:** Interclass coefficient good for item 7 & 8 & excellent for other items (> .75).	**Content validity:**Yes **Convergent**: Yes, correlates well with items DLQI & Skindex-29 (all p <.0001 except embarrassment p <.0003). **Discriminant:**NR	**Responsiveness** Statistically sig decreased severity & better QoL using UAS and CU-Q_2oL scores from baseline to 4 weeks (r = .49, p= .001.	**Forward:** Yes **Back:** Yes **Patient:** Yes.

Table 4.3 continued

General	Construction	Description & Feasibility	Psychometric Properties			Cultural Validation
Reference **Language**	**Development** **Validation Sample size**	**Items/ Domains** **Response Score/Time Frame**	**Reliability**	**Validity**	**Responsiveness/** **CSC**	**Translation**
Diaz et al. 2011 Brazilian-Portuguese	**Sample size:** 112 (86% female) **Measurement goal:**Cross-cultural adaption **Item reduction:** Statistical (factor analysis)	**Items:** 23 **Domains:**3 1: Sleep/mental status/ eating 2: Pruritus/Impact on life activities 3. Swelling/limits/looks **Rest same as original**	**Internal reliability:** Cronbach alpha all > .8 **Test-retest:** Interclass coefficient excellent for total score (.87) and individual scores (all .> 78)	**Content validity:**Yes **Convergent**: Good with DLQI items. Mean score with DLQI significant (r = .76. p < .000) **Discriminant:** Using ANOVA distinguished QoL between patients with low and high scores on the UAS.	**Responsiveness** Correlation with UAS at baseline and four weeks moderate (r= .39, *p* < .0001) & null (r= .47, *p* = .056) respectively	**Forward:** Yes **Back:** Yes **Patient:** Yes.
Kocaturk et al. 2012 Turkish	**Sample size:** 140 (70% female) **Measurement goal:**Cross-cultural adaption **Purpose:** Evaluation/ Discrimination **Item reduction:** Statistical (factor analysis)	**Items:** 23 **Domains:** 6 1. Itching 2. Swelling/ mental status 3. Functioning 4. Sleep 5. Eating 6. Limits **Rest same as original**	**Internal reliability:**All > .7 except Limits (.50) and Looks (.68) **Test-retest:** NR	**Content validity:**Yes **Convergent**: Good with DLQI & Skindex-29 items. Total scores significant between CU-Q_2oL & DLQI (r = .77, *p* = .001) and Skindex-29 (r= .74, *p* < .001) **Discriminant:** Using ANOVA distinguished QoL between patients with scores on the UAS in the 1 to 4 quartile range.	**Responsiveness** Two monthly intervals over 8 weeks saw sig changes in UAS & CU-Q_2oL score 33.9 ± 19.6 to 22.6 ± 16.2. (r = .44, *p* < .0001)	**Forward:** Yes **Back:** Yes **Patient testing:** Yes
Mylnek et al. 2009 German	**Sample size:** 157 (Females 2:1 ratio) **Measurement goal:** Cultural adaption **Purpose:**Evaluation/ Discrimination **Item Reduction:** Statistical (factor analysis)	**Items:** 23 **Domains:** 5 1. Functioning 2. Sleep 3. Itching/ embarrassment 4. Mental status 5. Limits looks **Rest same as original**	**Internal reliability:** All >.7 except Limits/Looks (.52) **Test-retest:** NR	**Content validity:**Yes **Convergent**: Good with DLQI and Skindex items. All two-tailed correlations significant (*p*>.001) **Discriminant:** NR	NR	**Forward:** Yes **Back:** Yes **Patient testing** Yes

Table 4.3 continued

General	Construction	Description & Feasibility	Psychometric Properties			Cultural Validation
Reference **Language**	**Development** **Validation Sample size**	**Items/ Domains** **Response Score/Time Frame**	**Validation Study/ Reliability**	**Validity**	**Responsiveness** **CSC**	**Translation**
Valero et al. 2011 Spanish	**Sample size:** 695 475 (68% spontaneous CU) **Measurement goal:**Cross-cultural adaption **Purpose:** Evaluation/ Discrimination **Item reduction:** Patients & experts Factor analysis	**Items:** 23 **Domains:**6 1. Pruritus, 2. Swelling 3. Impact on Life Activities 4. Sleep Problems 5. Looks 6. Limits **Rest same as original**	**Validation Study size :** 125 **Internal reliability:**All alpha > .8 **Test-retest:** NR	**Content validity:**Yes (patients) **Convergent**: Good with Skindex-29 items. Correlation .81 with CU-Q_2oL overall scores **Discriminant:**Using ANOVA Differentiated between different severities of wheals & pruritus	Sig. correlations between baseline to 4 weeks of Cu-Q_2oL scores (all $p < .0008$) for subscales & overall score for patients reporting better health state transition.	**Forward:** Yes **Back:** Yes **Patient:** Yes.

Being the only CU disease-specific QoL instrument for understanding the nature of QoL in CU samples, difficulties may occur in terms of being able to instantly compare results across studies, however in terms of the individual items this would not be a problem for conducting a meta-analysis in the future. Further the labelling of some domains in some versions does not appear to reflect a particular concept (e.g. *Swelling/mental status* in Mylnek et al. 2009*)*. When interpreting the findings of factor analysis (especially principal components analysis) researchers need to consider whether to keep items on individual's subscales based on being statistically linked to a factor or whether items would be better conceptually placed elsewhere.

4.4: Discussion

The objective of this study was to systematically review QoL questionnaires used in CU research by assessing their psychometric properties to draw conclusions regarding their suitability for CU research. Overall the critical evaluation of the instruments in subsections 4.3.3 and 4.3.4 implied that there is currently no one particular questionnaire that can be currently classified as the gold standard measure of quality of life in CU. Generic instruments lacked rigorous psychometric testing in CU, dermatology-specific instruments were controversial (e.g. no factorial validity, lack of clinical usage) and the plethora of versions of the CU-Q_2oL made cross comparisons difficult to interpret. These findings will be discussed in turn with all questionnaires being discussed together with a main focus on the CU-Q_2oL.

Generic measures lack psychometric testing in CU

This is not the first review to conclude the first point on generic measures. Both et al. (2007) in their systematic review of QoL instruments reported the lack of psychometric testing of generic instruments across dermatological conditions but this is not surprising considering that many were developed to measure health status or QoL in general populations. Regardless the SF-36 has the advantage over the WHOQoL brief and NHP in that its convergent validity with the disease-specific CU-Q_2oL has been successfully established. However, if the convergent

validity of the WHOQoL and CU-Q_2oL is tested in future this may change as the WHOQoL is a valid measure of QoL and not health status. Whatever the psychometric properties of these instruments are generic measures should be a compulsory part of overall patient-reported outcome in CU, at least at the policy and grant application level. For this reason and that on convergent validity reviewed earlier the SF-36 for now appears to be the most favourable generic instrument, however in the introduction it was stipulated that both a generic and specific instrument should be used to compensate for generic measures that do not cover disease-specific aspects for a given population.

Dermatology-specific instruments lack factorial validity or usage for CU research

The second main finding was the lack of usage or factorial validity of the majority of dermatology-specific instruments in CU research. In respect to the FLQA-d, despite it being one of the only instruments to have been developed and validated with patients with CU in its research sample, it has not been used in CU samples outside of its development paper (Augustin et al. 2000) and has rarely been used in dermatology research in general (Both et al. 2007). In light of this the Skindex-29 and DLQI appear to be better options for CU research. The Skindex-29 was found to be developed and validated in a dermatology patient sample which did not include those with CU however support for its validity for use in CU research has come indirectly through its use in the convergent validity of the psychometric and cultural validations of the Polish, German, Spanish and Turkish versions of the CU-Q_2oL. In these studies the Skindex-29 showed strong convergent validity but it also showed evidence of some significant item redundancy with the CU-Q_2oL. This finding indicates that the Skindex-29 could be used alone without the complimentary use of the CU-Q_2oL as they would be essentially measuring the same concepts. As it is dermatology-specific it is suggested that it would be a good choice when CU samples are being compared to other dermatological conditions only than the FLQA-d.

In contrast the dermatology-specific DLQI has an advantage over other FLQA-d and Skindex-29 in that it has been well validated and used in CU research. It assumedly exhibits what busy clinicians in practice really want which is something that is simple to use (one page, 10 short items, < two minutes completion), quick and easy to score (simple addition with no standardising or weighting of domains), easy to interpret at a glance and integrates well into decision making. Further the DLQI has been used in 33 skin conditions, in 32 countries, in 55 languages and has been subjected to 115 studies related to its psychometric properties (Basra, Fenech, Gatt, et al. 2008), hence there is a substantial amount of reference value data available to compare across CU samples and to other dermatological conditions. In light of this the DLQI does have psychometric problems. Referred to as a one-dimension instrument of disability and not QoL, a recent study subjected it to the rasch analysis questionnaire measurement model in psoriasis and atopic dermatitis and found major concerns in respect to its dimensionality, measurement properties, response format and ability to differentiate functioning by skin disease, age and gender (Twiss, Meads, Preston et al. 2012). Subsequently, it has been stated that the psychometric requirements for instruments have evolved since the DLQI's development in 1994 and researchers need to use better alternatives as its limitations now outweigh its simple applicable use (Nijsten, 2012).

The CU-Q_2oL as a step forward in CU-related quality of life research

The CU-Q_2oL addresses the limitations of the DLQI in that it is a CU-specific instrument and will therefore consist of items that this population will be more familiar with (i.e. it has good face validity). CU consensus management guidelines recommendation the disease-specific CU-Q_2oL as the official gold standard measure of CU-related QoL (Zuberbier et al. 2009b) but this may become a tenuous decision in future research and practice if issues regarding applicability and factor structure are not addressed. In respect to the former the CU-Q_2oL is inferior in its applicability than the DLQI as it has over double the amount of items (23 verses 10) takes over

twice the time to complete (five verses two minutes) and most importantly it is considerably more difficult to score and interpret due to the need to standardise and transform the scores of the weighted domains to a 0-100 scale (meaning it is not easy to interpret at a glance). This indicates that it may work well in a research context where there is more time to interpret scores at the group level but may be more difficult to integrate it in busy tertiary CU clinics where applicability ultimately lies in the practicality of how quick they are to administer and their ability in helping to make decisions about patient care amongst an array of other consultation based procedures (Farnik and Pierzchala, 2012). One way to overcome this problem would be to send out the CU-Q_2oL with the patient's appointment letter at the first consultation and follow-up phases of their consultations but this still does not resolve CU-Q_2oL data analysis and interpretation in clinic to make quicker decisions about care.

One way to implement the CU-Q_2oL better into clinical practice could be to implement what other researchers in QoL measurement have recently undertaken to overcome this problem which is to take advantage of new technological tools such as tablet computers and smart phones (Naik, Hess and Unruh, 2012; Zubaran and Tres, 2011). What this research has suggested is that through such devices patients can complete QoL measures before hospital visits at home and send them in advance or complete them pre-consultation in clinics. At the point of consultation the data is either already analysed by a simple computer program or ready for quick analysis during the consultation respectively.

In terms of the factor structure of the CU-Q_2oL, although it is good practice to cross-culturally validate instruments, the differing published factor structures emerging from such analyses (see Table 4.3) brings the original item generation/ reduction process of the original Italian questionnaire items by Baiardini et al. (2005) into question. Where the Spanish version only underwent a language translation of the original Italian instrument the Brazilian-Portugese,

German, Polish and Turkish versions underwent an additional factor analysis of a translated version (see Table 4.3). Some of these versions have no resemblance to the original domains of Baiardini et al. (2005) and as mentioned earlier in this study have domain names which might make it difficult to establish what the essence of the domain is conveying (e.g. sleep/mental status/eating in the Dias et. al. (2011) Brazilian-Portugese version and swelling/ mental health in the Kocaturk et al. (2008) Turkish version). Such an occurrence makes it difficult to determine whether the original items cannot be replicated because they do not represent a valid subjective account of quality of life in CU or whether the non-identical versions are representing actual cross-cultural differences in CU-related outcome.

Despite the identified shortcomings of the CU-Q_2oL, it is unquestionably a measure of QoL not health status (e.g. SF-36; NHP) or disability (DLQI) created specifically for CU populations and for this reason it is worth pursuing ways to improve it. Such implementations are important in light of findings by Speight, Reaney and Barnard (2009) who found in their systematic review of QoL instruments in diabetes that researchers had chosen QoL measures in the past based on the following highly inadequate criteria: (1) the instrument had the term QoL in the title; (2) it was what others were using or (ii) it was the most easily accessible. The array of non-validated measures used to measure CU-related QoL from 1997 to 2005 is evident in CU research which lead to the development of the CU-Q_2oL (Baiardini et al. 2005). A standardised expert consensus framework for cross-culturally adapting future language and psychometric translations of the instrument is recommended. This may include a standardised guide, which considers patient characteristics that were found to significantly relate to CU-related QoL in Study 1 (e.g. concurrent physical urticaria, positive ASST tests, and concurrent angioedema), which could explain the differences in the versions and be controlled for.

Two such confounding factors that have not considered in the development of the CU-Q_2oL is the strong and significant relationship between psychological variables and QoL. It was

reviewed in Section 1.5.5 that high CU-related anxiety and depression (as a clinical diagnosis or outcome as psychological distress) bared a strong negative correlation to CU-related QoL. More specifically studies found that those with higher formally diagnosed psychiatric morbidity (e.g. Staubach et al. 2006a; Ozkan et al. 2007; Uguz et al. 2008) or psychological distress outcome (e.g. Barbosa et al. 2011; Bzoza et al. 2011) scored significantly worse on QoL measures than those without. With up to two-thirds of individuals with CU estimated to have some level of co-morbidity as a determinant or outcome (see section 1.5.4), such factors need to be accounted for in CU-related QoL questionnaire development as they may considerably alter the final instrument causing unaccounted for floor and/ or ceiling effects.

Wider issues pertaining in quality of life research

In addition to the main findings discussed, this systematic review study did confirm some wider issues that still prevail in QoL research and practice. The first related to the need to distinguish between whether one is measuring health status, disability or quality of life. As in other dermatology based QoL measurement systematic reviews the SF-36 and DLQI had to be included here as they had been previously used substantially to measure QoL, not disability or health status (see Table 3.1 QoL studies in CU summary table in Chapter 3 for many examples). As justified earlier, not including such measures would have biased the review, especially as the DLQI, that was (and probably still is) the unofficial gold standard QoL measure in dermatology research. Including the DLQI has allowed for its psychometric adequacy for research in CU to be critically evaluated in further detail and its psychometric ability to measure multi-dimensional CU-related QoL to be compared to other instruments. Of relevance to this, studies systematically reviewed in Study 1 using the DLQI predominantly reported a mild impact on QoL as to the CU-Q_2oL, which indicated a more moderate impact. With the CU-Q_2oL being evaluated as a more adequate instrument than the DLQI, this indicates that CU has a more moderate impact on QoL. To support this, the generic SF-36 and dermatology-specific Skindex-29 (which showed good

convergent validities with the CU-Q_2oL) also indicate a moderate impact of CU on quality of life.

Another core question related to the applicability of QoL questionnaires in clinical practice (i.e. what the data will be used for). QoL measurement in CU clinics is not routine at present and whether they will continue to only be used as a clinical end-point in drug pharmaceutical trials or to help referrals to improve bio-psychosocial wellbeing is currently unknown. A study by Salek, Robert and Finlay (2007) found that of 64 dermatological consultations 37 (or 28.00%) of clinicians used QoL information if it was made available to them and 57.0% of these clinicians used the information they provided in decision-making processes about disease management.

Methodological considerations of the existing review study

This systematic review has highlighted important issues that researchers and clinicians need to consider, however its shortcomings do require some consideration. It should be remembered that the selection criteria was restricted to questionnaires and papers available in English language, excluding CU studies using culture-specific measures (Grob, et al. 1999). Also the suitability of other QoL questionnaires not featured in CU psychometric validation studies were not considered. However the instruments included in the review are the ones expected to be found in dermatology QoL research (Both et al. 2007) and instruments such as the Dermatology Quality of Life Scales (DQoLS; Morgan, McCreedy, Simpson, Hay, 1997), Dermatology-Specific Quality of Life (DSQoLS; Anderson and Rajagopalan, 1997) and the Sickness Impact Profile (SIP; Bergner, Bobbit et al. 1981) were also of American or European origin. The DQOLS has also been assessed to have problematic development and psychometric issues (Both et al. 2007) whereas the DSQL's development and validation was limited to acne and contact dermatitis patients. Both instruments are rarely used in dermatology research and the SIP is a lengthy 136-item tool that mainly focuses on disability.

4.5: Recommendations and Conclusions

Which instruments to select will depend upon the study design and the most important psychometric properties (e.g. responsiveness for longitudinal research and discrimination for cross-section studies). However if patients with CU are evaluated alone or compared with illnesses outside dermatology a combination of the SF-36 and CU-Q_2oL (which have good convergent validity) is recommended. If CU is to be compared with other skin disorders, a combination of the SF-36 and Skindex-29 is recommended. In light of this the SF-36 and an English translated CU-Q_2oL will be used in the theses commencing studies.

Chapter 5

General Research & Analytical Methods

5.1: Introduction

Two systematic review studies were undertaken in the previous two chapters to provide consensus reference values on the impact of CU on quality of life (QoL) for comparative purposes in thesis' proceeding studies and to establish which instrument/s were the most valid and reliable for CU research. This chapter describes the general methods used across the remaining studies of the thesis. Rationales for the study designs are justified and the illness population under investigation is described in terms of recruitment and selection. The instruments used to explore variables across studies are described including their validation and how they are scored and interpreted. The chapter ends with a rationale and account of the quantitative and qualitative techniques employed to test the thesis' research hypotheses.

5.2: Design Rationale

A range of other research designs were employed in this thesis. A summary and explanation of why they were used are presented in the sections below.

5.2.1: Psychometric Study

The Revised Illness Perception Questionnaire (IPQ-R; Moss-Morris et al. 2002) and Beliefs about Medicines Questionnaire (BMQ; Horne et al. 1999) were respectively developed to tap into representations of illness and treatment and have produced replicable findings in a range of chronic illnesses (see section 2.2). Both have also been used to explore representations, QoL and psychological distress. Study 3 assessed their psychoimetrtic properties in CU. As both had not been used in CU it was important to determine if CU data collected from them represented an adequate fit of the questionnaires structures.

5.2.2: Cross-Sectional Study

Study 4 consisted of a cross-sectional study to determine if CU representations predicted QoL outcomes mediated by coping as predicted by the CSM (Leventhal et al. 1980; Leventhal, Nerenz and Steele, 1984). If confirmed it would help support that some of the variance in CU outcome could be explained by socio-cognitive factors. It would also place quality of life in CU in a new framework to explore CU representations as potential mechanisms of change in CU interventions. There is little evidence of coping as a mediator in the CSM (p36-37) but as this was the first exploration of the CSM in CU all avenues were explored.

5.2.3: Qualitative Study

Study 5 explored qualitative accounts of how individuals made sense of their CU via semi-structured interviews. This study was incorporated as much post-study 'talk' from participants in study 4 which expanded on their perceptions of CU went beyond the detail possible from the quantitative methods. This study used the methods of interpretive phenomenological analysis (IPA; Smith 1996; Smith, Flowers and Larkin, 2009) and the intention was not to confirm the CSM, however IPA follows a similar philosophy of assuming that there is an interaction between people's cognitions and emotions where they are trying to make sense of their world that they often find difficult to express. It was for this reason IPA was chosen.

Numerous qualitative approaches used previously to explore illness representations were considered including grounded theory and thematic analysis (e.g. Koenigsmann, Koehler, Regner et al. 2006; Wong, Kennedy, Marshall and Gaillot, 2011; Heyhoe and Lawton, 2009; MacInnes, 2006) and discourse or narrative analyses. Even though grounded theory (Birks and Mills, 2011) would have worked well in terms of drawing convergences within large samples for a more general conceptual explanation of socio-cognitive process with theoretical models, this study was not looking to analyse a large dataset to support a theory (as in studies 3 and 4).

Thematic analysis (TA) was considered as a good candidate as unlike grounded theory (GT) it is more flexible to use and not held to the methods of its philosophical position (to develop theory) but can use the methodologies of GT to summarise data and interpret what they mean (Braun and Clarke, 2006). The problem with TA is that an idiographic approach is not used and the whole dataset is usually analysed as to concentrating on an individual case and also looking for differences and divergences within the text (not that this cannot be done in TA). This study further explored CU specific information about the individual experiences in a small purposive sample and this is why IPA was chosen, particularly with its more structured methods. The discourse analysis approach is cynical about the accessibility of cognitions focusing on the functioning of language in a social context more than it's meaning (Willig, 2007). Narrative approaches (Murray, 2007) were considered but meaning-making goes beyond narratives (e.g. discourse). The study had implications for understanding more about the perceived CU lived experience.

5.2.4: Longitudinal Study

Study 6 used a longitudinal design to report an intervention aimed to establish if cognitive representations of CU were amenable to change and result in significantly better quality of life. It incorporated guidelines by the Medical Research Council (Campbell, 2000; Craig et al. 2012), those in behavioural medicine and health psychology (Davidson et al. 2003; Abraham and Mitchie, 2008), and CSM interventions (section 2.5, p45). Its' measures derived from systematic review studies 1 and 2 which established reference values and valid measures of CU-related QoL and studies 3 and 4 which fulfilled the first two steps of MRC guidelines (see section 2.5) This study fulfilled the third step that interventions should '*undergo a pilot study'*. The study included psycho-education to change CU perceptions and action plans to change behaviours. Representations and QoL were assessed at baseline, one-month and 3-month post-intervention. It had research implications for developing an RCT to confirm the study effects and practical implications for incorporating such interventions adjunct to medical care.

5.3: Participants

5:3.1: Recruitment

All research data was obtained from patients diagnosed with chronic spontaneous urticaria (CU). Recruitment for all studies were possible through a collaboration initiated by the thesis author (DB) to Consultant Dermatologists at St. John's Institute of Dermatology, St Thomas Hospital in London. An honorary research contract was agreed to allow access to patients. The hospital runs the only urticaria specialist clinic in the United Kingdom and referrals are taken from general practitioners and other health professionals nationwide and it not uncommon for patients to travel from all over the UK. Two recruitment strategies were employed across studies. Participants were identified through the clinics patient database or during their consultation with consultant dermatologists. Database patients were recruited by phone by the clinics administration staff that asked patients for permission for their contact details to be forwarded to the researcher. The researcher informed patients about the study. Clinic patients were informed by the consulting dermatologist and introduced to the researcher if an interest was shown. All patients received an invitation letter, research participant information sheet and a consent form to read to help them decide for at least a 24hr period.

5.3.2: Sample Size

Sample sizes across studies varied according to the design and methods used (see individual studies). Power analyses for quantitative studies were determined using the computer programme G Power 3 (Buchner, Erdfelder and Faul, 2007). Medium effect sizes (0.5), with a power of 0.8 and probability value of .05 were applied.

5.3.3: Study Selection Criteria

The selection criterion across studies (including systematic reviews) referred to European guidelines for urticaria (Zuberbier et al. 2009a). Participants were included if they: had

a medically confirmed primary diagnosis of chronic spontaneous urticaria (i.e. idiopathic or autoimmune); were at least 18 years old and spoke fluent English. Participants were excluded if they had: primary acute or physical urticaria or a formal psychiatric diagnosis.

5.4: Measures

5.4.1: Process Measures

Revised Illness Perception Questionnaire (IPQ-R)

The IPQ-R (Moss-Morris et al. 2002; Appendix 3a, pA11) measures common-sense beliefs about illness. Its subscales (with original Cronbach alphas) are described below.

Illness Identity Subscale (.75):

The identity subscale assesses symptoms attributed to illness. It consists of 14 commonly experienced symptoms but itchiness, swelling and wheals common to CU were added. To avoid measuring somatisation participants are asked to report on a dichotomous scale whether they have experienced each symptom *since* their CU began before reporting if each *is related* to their CU. The more yes' for the latter scale indicate a stronger identity.

Cause Attributions Subscale

The cause subscale measures 18 commonly reported causal attributions of illness. Participants indicate on a 5-point Likert scale (1= strongly disagree to 5= strongly agree) whether they believe each contributed to their illness. Items are further categorised into psychological (.86), risk factor (.77), immunity (.67) and accident/ chance (.23) causes.

Seven Factor Solution Subscales

The remaining subscales of the IPQ-R consist of 38 items across seven subscales (*consequences* (α .84), *timeline acute/ chronic* (α .89), *timeline cyclical* (α .79), *personal control* (α .81), *treatment control* (α .80), *illness coherence* (α .87) and *emotional representations* (α .88).

Participants indicate on a 5-point Likert scale whether they agree with each statement (where 1= strongly disagree to 5= strongly agree). Scores per subscale are summed and then divided by the number of items in that subscale. Higher scores represent perceptions of more serious consequences, chronic timeline, cyclical timeline and emotional representations but greater beliefs in personal and treatment control and illness coherence (understanding illness). In 711 patients among 8 illness groups, all scales demonstrated good internal reliability, test-retest reliability, known group discriminant validity and predictive validity. The Internal reliability and structural validity of the IPQ-R is examined further in study 3.

The Beliefs about Medicines Questionnaire (BMQ)

The BMQ (Horne et al. 1999; Appendix 3a, pA12) assesses commonly held beliefs about taking prescribed medicines and treatments. Part 1 assesses general concerns about the harmful effects of medicines and their overuse by doctors. Only the second part *BMQ-Specific* was used and assesses beliefs about medications specifically prescribed for an illness. Its subscales are described below:

*Specific Necessity***:** This five-item subscale assesses beliefs about the necessity of taking medicines. Psychometric testing has shown good internal consistency across different illnesses ($\alpha > 0.7$) and test-retest reliability. It's good convergent validity was establishe and discriminant validity was confirmed which distinguished between different illness and treatment groups.

Specific Concerns: This five-item subscale assesses concerns about taking CU medicines. Psychometric testing has shown that it has good levels of internal consistency across differing illnesses (Cronbach $\alpha > .63$ to .8) and a test-retest reliability of .76 in asthma using Spearman's rho. Good convergent validity was confirmed and discriminant validity tests distinguished between different illness and treatments groups.

Participants indicate whether they agree with each statement on a 5-point Likert scale

(where 1= strongly disagree to 5= strongly agree). Scores are summed per subscale then divided by the number of items in that subscale leaving a score range of 1-5. Higher scores suggest stronger beliefs in the necessity of medicines and stronger concerns about usage. The Internal reliability and structural validity of the BMQ-Specific is examined further in study 3.

The Brief COPE

The Brief COPE (situational and retrospective format; Carver, 1997; Appendix 3a, pA13) assesses 14 conceptually different coping strategies. Its subscales (with original Cronbach α coefficients) are: Active Coping (.68); Planning (.73); Positive Reframing (.64); Acceptance (.57); Humour (.73); Religion (.82); Using Emotional Support (.71); Using Instrumental Support (.64); Self-Distraction (.71); Denial (.54); Venting (.50); Substance Use (.90): Behavioural Disengagement (.65); Self-Blame (.69). Respondents indicate on a 4-point Likert scale whether they agree with its statements (where 1= "I haven't been doing this at all" to 4= "I've been doing this a lot"). Scores are summed per subscale (each has 2 items) and higher scores mean a greater use of a strategy. As recommended by the authors a PCA (using a non-orthogonal direct oblique rotation with Kaiser Normalisation) was undertaken using CU data from study 3 to reduce its number of variables (see Table 5.1, p139). The data met KMO criteria for sampling adequacy (MSA=.73) with individual KMO's exceeding .6. Bartlett's test of sphericity (x^2 (66) = .346.27, p <.001) indicated the data was adequate for PCA which generated 4 components with eigenvalues greater than 1 and accounted for 69.63% variance.

Component 1 consisted of the subscales active coping, planning, self-distraction and positive reframing and was named 'pro-active coping'. Component 2 consisted of the behavioural disengagement, venting, denial and self-blame subscales and was titled 'negative cognitive appraisal'. Component 3 consisted of the subscales humour, acceptance and a smaller loading for positive reframing. Even though positive reframing loaded statistically betteron component 1,

it was decided that it fitted conceptually better on component 3 and was moved there and named 'positive cognitive appraisal'. This final component contained loadings for 'use of emotional support' and 'instrumental social support' and named 'use of support resources'. All scales showed good internal consistency, which ranged from .59 to .78.

Table 5.1: Second order PCA pattern matrix of the COPE 14 a-priori subscales

Subscale	Component			
	1	2	3	4
Pro-Active Coping (.77)				
Self-distraction	**.78**			
Active coping	**.73**		.41	
Planning	**.52**		.51	
Negative Cognitive Appraisal (.82)				
Behavioural disengagement		**-.84**		
Self-blame		**-.80**		
Denial	.41	**-.64**		
Venting		**-.59**		
Use of Support Resources (.59)			**.82**	
Use of instrumental social support			**.76**	
Use of emotional social support				
				.45
Positive Cognitive Appraisal (.60)				**.79**
Positive reframing	.53			**.74**
Humour				
Acceptance				

A reliability analyses of the Brief COPE 14 subscales found that 10 produced coefficients that were similar or better than the original validation paper. Denial and venting showed the best improvements (5.4 verses .81 and .5 verses .71 respectively). However self-distraction produced a coefficient of 4.6 as to .71, social support .57 as to .64, behavioural disengagement .55 as to .65 and religion .67 as to .82.

The Common-Sense Interview

The Common-sense interview is a semi-structured interview schedule developed for the thesis (Appendix 4, pA37) and follows guidelines from Smith and Osborn (2003). Its purpose was to collect qualitative data on CU illness representations and lived experience for study 5. Its second purpose was for interviewing participants in study 6. The schedule asks questions regarding ones personal accounts of their illnesses (e.g. identity, cause, CU medicines, coping). Questions on QoL were not included as it was hoped that these would naturally emerge from responses to questions on representations and coping. Probing was used to obtain detailed accounts and allow novel insights to emerge. Prompts were kept to a minimum.

5.4.2: Outcome Measures

Hospital Anxiety and Depression Scale (HADS)

The HADS (Zigmond and Snaith, 1983; Appendix 3a, pA14) assesses state anxiety and depression. Its' 14-items are equally divided between the two subscales of anxiety and depression. Respondents indicate on a 4-point Likert scale (0 to 3) how much they agree with the statements providing a score range of 0-21 per subscale. For both scores of 8-10 indicate possible disorder and 11-21 probable a disorder. Psychometric evaluation in outpatients and cancer patients demonstrated high levels of internal consistency (Anxiety Cronbach alphas .93; Depression, .90; Moorley, Greer, Watson et al. 1991) and face validity. Convergent validity was established with significant correlations between the HADS and similar scales (anxiety r = .54; depression, r = .79). In CU it has demonstrated good discriminant validity in those with and without a psychiatric diagnosis (Staubach et al. 2006).

Reliability analysis and PCA of the HADS subscales

A reliability analysis of the HADS subscales using CU data for chapter 4 showed Cronbach alphas for anxiety and depression of .84 and .87 respectively demonstrating good levels of internal consistency. A confirmatory PCA (using orthogonal Varimax method with Kaiser

Normalisation) showed factor loadings that demonstrated a near perfect rotational match where all depression items loaded on component 1 and all but 1 anxiety item (A4 'I can sit at ease and feel relaxed') loaded on item 2.

Table 5.2: Principle Components Analysis of the HADS in CU

	Component	
Item	**1**	**2**
D6 I look forward to the enjoyment of things	**.801**	
D7 I can enjoy a good book or radio or TV programme	**.783**	
D3 I feel cheerful	**.779**	
D1 I still enjoy the things I used to enjoy	**.779**	
A4 I can sit at ease and feel relaxed	**.739**	
D2 I can still laugh and see the funny side of things	**.688**	
D4 I fee as if I am slowed down	**.637**	
D5 I have lost interest in my appearance	**.497**	.414
A5 I get sort of frightened feelings like butterflies in the stomach		**.814**
A2 I get sort of frightened feeling as if something awful is about to happen		**.803**
A7 I get sudden feelings of panic		**.791**
A3 Worrying thoughts go through my mind		**.716**
A1 I feel tense and wound up		**.577**
A6 I feel restless as if I have to be on the move		**.522**

The data exceeded KMO criteria for sampling adequacy (MSA= .85) with individual values exceeding .7 and most > .8. Bartlett's test of sphericity (x^2 (91) = 572.43, p < .001) indicated that the data was adequate for PCA. This fixed 2-factor solution (eigenvalues greater than 1) accounted for 57.44% of the variance in the sample.

MOS 36 Item Short-Form Health Survey (version 2)

The SF-36v2 (Jenkinson, Stewart-Brown, Peterson, Paice, 1999; Appendix 3a, pA17) was reviewed extensively in Study 2 (p111) where it was recommended as the most valid and reliable measure of generic health status and QoL in CU (p130). In summary it has 36 items

across 8 subscales (abbreviations and Cronbach alphas): *physical functioning* (PF; 0.92; *role physical* (RP; .95) *bodily pain* (BP; .85); *general health perceptions* (GH; .8); *vitality* (VT; .84); *social functioning* (SF; .85); *role emotional* (RE; .92) and *mental health* (MH; .84). Response options vary between subscales (3-5 point Likert scales) but items within each are summed before being transformed on a scale of 0 to 100 per domain (from worst health state to best respectively). Mean scores between 0- 49 indicate below average health and 51-100 as above average health. The SF-36 v2 has shown good internal consistency with all Cronbach alphas above .8 for all subscales. Construct validity (via t-tests) was established with poorer health scores for women and chronically ill populations (p <0.001). A PCA confirmed that its subscales could be reduced to 2-factors, the physical summary component (or PCS consisting of PF, RF, BP, GH) and mental component summary score (or MCS consisting of VT, SF, RE, MH). As it is a standardized measure with established reference values for the general population, further psychometric analysis was not required.

The Chronic Urticaria Quality of Life Questionnaire (CU-Q_2OL)

The CU-Q_2oL (Baiardini et al, 2005; Appendix 3a, pA15) was recommended as the most valid and reliable measure of disease-specific quality of life in patients with CU (p130) and extensively reviewed in chapter 4 (see p118-122) where it was show to have good psychometric properties. In summary it consists of 23 items across 6 subscales (pruritus; swelling; impact on life activities; sleep problems; limits and looks) where respondents indicate on a 5-point Likert scale whether they agree with its symptoms or statements (from 'not a lot' to 'very much'). Higher scores indicate poorer HRQoL.

Cultural Translation, Reliability and Principle Components Analysis of the CU-Q2oL

As highlighted in the systematic review in Chapter 4 (p118-122) the CU-Q^2OL at the time of the thesis' duration was unavailable in English so a cultural adaptation was undertaken. The process included a collaboration made between the thesis author (DB) and academics in London

Metropolitan University's language department. First the Italian version was forward translated to English independently by two academics that were fluent in both languages. Both translators then together worked on a combined version that was agreed to a consensus with the thesis author. Another academic who was blind to the Italian original then back translated this combined version into Italian. These were compared before adaptations and a consensus was made on the final English version. The CU-Q^2oL original authors were contacted when necessary. All versions can be found in Appendix 3b, (pA27).

A confirmatory PCA was conducted to establish how the current study sample data fitted the factor structure of the English translated CU-Q_2oL. An orthogonal Varimax method with Kaiser Normalisation was used to rotate factors to a simple fixed 6-factor solution. The data exceeded the minimum Kaiser-Meyer-Olkin (KMO) criteria for measuring sampling adequacy (MSA= .89) with individual KMO values all between .8 and .9 represent good to superb adequacy. Bartlett's test of sphericity (x^2 (253) = 1458.11, $p < .001$) indicated that the data was adequate a PCA. The fixed 6-factor solution (eigenvalues greater than 1) accounted for 77.14% of the variance in the CU sample (Table 5.3, p143).

Component 1 consisted of 4 of 5 items representing the *sleep problems* subscale plus a loading for the conceptually similar impact on life activities item 'interferes with sleep' and a small loading for 1 looks item. Component 2 contained 5 of the 6 items that represented the *impact on life activities* subscale plus a small loading for the conceptually similar item 'limits on sporting activities' and a loading for 'concentration' from sleep problems. Component 3 failed to represent a component of the CU-Q_2oL with 2 loadings for looks and 1 each for sleep problems ('I feel nervous') and impact on life activities (social activities). Component 4 loaded all 2 loadings for swelling but the 2 symptom items for pruritus also loaded on this component in addition to loadings 1 limit item ('choosing clothing'). Component 5 contained both the pruritus items that loaded on component 4 plus 2 looks loadings.

Table 5.3: Principal Component Analysis of the CU-Q_2oL

Subscale	Component					
	1	2	3	4	5	6
Q12 Wake up during the night	.84					
Q13 Feel tired during the day because you didn't sleep well at night	.77					
Q11 Have difficulties falling asleep?	.75	.45				
Q07 Interfere with sleep	.69	.42				.42
Q14 Difficulty concentrating?	.51	.79				
Q05 Interfere with work		.71				
Q06 Interfere with physical activities		.65	.52			
Q09 Interfere with social relationships		.64				
Q23 Drug side-effects		.62				
Q08 Interfere with spare time			.77			
Q19 Embarrassed in public places						
Q18 Embarrassed by urticaria on body?			.74		.41	
Q15 Feel nervous			.71			
Q16 Feel down			.59			
Q03 Swollen eyes				.80		
Q04 Swollen lips				.78		
Q02 Wheals				.52	.49	
Q21 Clothing		.44			.77	
Q22 Interfere sport activities					.65	
Q20 Cosmetics	.46				.53	.46
Q01 Pruritus (itching)				.47	.51	
Q17 Restrict what you eat?						.76
Q10 interfere with eating						.56

Component 6 like component 3 failed to represent a domain of the CU- Q_2oL presenting for 1 limits and 1 impact on life activities items both related to eating plus small loadings for 1 looks and 1 sleep item. In general the *looks* and *limits* domains presented as the most unstable items. However a reliability analysis of the newly English translated CU-Q_2oL did show good levels of internal consistency with alpha coefficients all above .7 (of which 3 subscales were >.8). These finding matched or bettered the coefficients of the original development study (e.g. pruritus .9 as

to .79). The findings overall are in line with other CU-Q_2oL revalidation studies that have failed to completely replicate the original and this has resulted in published culture-specific versions with different factor analysed domains (p118-122 for a full account). In order to not produce another version and in light of the good internal reliability produced here, it was decided to maintain the domains of the existing Italian version for the thesis and focus on the translation.

5.4.3: Patient Characteristics Questionnaires

You and Your urticaria Questionnaire (versions 1 and 2)

The 'You and Your Urticaria Questionnaire' (Appendix 3a, pA10) was designed to obtain participant characteristics commonly found in the CU research literature and variables that may act as co-variants. Version 1 collects data on: gender; age; ethnicity; qualifications; occupational and marital status; CU subtype; angioedema; physical urticaria; diagnosing practitioner; age at disease onset; disease-duration; GP visits; CU medicines and dietary restrictions. Version 2 is used for study 6 adds 'other chronic illness and previous counselling for CU'. Categorical data was dummy coded where necessary (e.g. white= 0; non-white= 1).

*Urticaria Activity Score-7**

The urticaria activity score (UAS7; Mlynek et al. 2008; Appendix 3a, pA20) is a measure of CU disease-activity. Over a 7-day period respondents report their perceived itch severity on a scale of 0-3 (i.e. none, mild, moderate, and intense) and approximate number of wheals on the same scale (none, <20, 20-50 and >50 in 24hrs). Weekly total scores for each subscale range from 0-21 (combined total 0-42) where higher scores mean worse overall urticarial.

5.4: Procedures

A range of procedures was use across the thesis. The systematic reviews (studies 1 and 2) entailed data extraction techniques from a standard protocol and CU data from the IPQ-R and BMQ (study 3) were subjected to reliability and factor analysis. Study 4 required participants to

complete questionnaire surveys by post or in clinic, while those in study 5 were interviewed and their data recorded and transcribed. Study 6 participants were subjected to interviews, questionnaire surveys, psycho-educational and behavior change techniques. More on these procedures can be found in the respective chapters.

5.5: Research Ethics

Studies 3-4 were approved by Guy's REC, London and studies 5-6 by Hampstead NHS REC London. Guy's Research and Development, London agreed both. The ethics application and supporting documents can be found in Appendix 5, pA52. The following documents can be found in Appendix 5: *Consent form (pA71); and Research Participant Information Sheet* (pA69).

5.6: Data Analysis

A range of statistical techniques was conducted analysed using SPSS and the AMOS structural equation modeling software package (both versions 19).

5.6.1: Exploratory Data Analysis

All quantitative data collected for studies 3, 4 and 6 were subjected to exploratory data analysis. Distribution tests were performed on continuous variable data to assess their suitability for undergoing parametric statistical analysis. If a variable had missing values these were specified by the value *200* (i.e. a figure not representative in any score values) with exception to the intervention in study 6 which used the Last Observation Carried Forward Method (LOCF) where the individual's previous score on a variable is entered as recommended by the Panel on Handling Missing Data in Clinical Trials (2010). Skewness and kurtosis scores for each variable were observed and converted to a standardised Z-score by dividing each by their corresponding standard error to ascertain if both were significant enough to cause problems in the data. Where required outliers were removed or replaced with a score that was the variable mean plus two standard deviations as recommended by Field (2009).

5.6.2: Factor Analysis: Principle Components Analysis

The internal consistency of all questionnaire subscales used in the thesis was examined by calculating their Cronbach alpha coefficients (Cronbach, 1951). First scores for each measure were checked for missing values and reversed-phrased items were adjusted to avoid biasing the alpha statistic and inappropriately lowering its value. Cronbach's α scores range from 0 to 1 where values of .7 and .8 suggest good reliability (Kline, 1999), however values were also compared to those of the questionnaires original development papers.

The construct validity of questionnaires were analysed using principal components analysis (PCA) to determine whether the CU data collected were representative of the instruments respective structures. If the data did not support the questionnaires construct validity, subsequent exploratory PCAs were undertaken. To undertake subscale items were subjected to preliminary multicollinearity and item redundancy tests by generating Pearson correlation matrices and checking for correlations greater than 0.9 and determinants of the R matrix less than 0.00001 (value should be greater). To ascertain that the sample size and data were adequate for PCA Kaiser-Meyer-Olkin (or KMO) criteria for measuring sampling adequacy and Bartlett's test of sphericity tests were undertaken. KMO values range between 0-1 and should as a bare minimum be 0.5 (Kaiser, 1974) where values of 0.5- 0.7 are said to be mediocre, 0.7- 0.8 good, 0.8- 0.9 great and 0.9 superb (Hutcheson and Sofroniou, 1999). Bartlett's should be significant at $p< 0.05$. The type of extraction (orthogonal or direct oblique) and factors to retain was determined by those used by the instruments original authors, however only Eigen values greater than one were seen as significant factors and individual coefficients for an item loadings had to be above .4 (Kim and Mueller, 1978).

5.6.3: Model Estimation and Goodness of Fit

Model fit was examined by Chi-square analysis (x^2). A non-significant chi-square ($p>.05$)

indicates that the model is a good comparative fit of the data. As the Chi-square statistic is affected by sample size (Fan, Thomspon and Wang, 1999) a number of goodness of fit indices were also analysed. The Comparative Fit Index (CFI) Normative Fit Index (NFI), Root Mean Sum of Error Approximation' (RMSEA; and its 90% confidence intervals) and the RMSEA close fit (goodness of fit in the population) were examined (Bentler, 1990; Hu and Bentler, 1999), CFI and NFI values range between 0-1 where .9 or higher indicate a good fit. An RMSEA of .05 or less indicates a good fit and .8 an adequate fit. Close fit should be > .5

5.6.4: Correlational Analysis

To examine relationships between study variables (studies 3, 4 and 6) Pearson's correlations were undertaken. Partial correlations were used to determine if significant relationships still held when patient characteristics were held constant. Correlations on non-normally distributed variables were assessed using Spearman's rho. Bonferoni corrections were applied to analyses to reduce the type-one error rate when doing multiple comparisons.

5.6.5: Hierarchical Multiple Regression Analysis

Hierarchical linear multiple regression was used to determine contributors and predictors of study outcomes. Only variables that correlated significantly to outcome variable under analysis was entered block-wise into each regression model with patients characteristics entered into the first block (where applicable) followed by illness and treatment perceptions, emotional representations and coping. The squared correlation coefficient (R^2) was observed in the initial block to assess the proportion of variance explained in the model. Significant changes in R^2 in subsequent blocks were determined by observing significant changes in the models F-ratio. The overall fit of each model was determined by observing the significance of the F-ratio assessed by analysis of variance (ANOVA) and the contribution of each predictor was assessed by observing its standardised beta coefficient (*B),* and its t statistic. For all statistics a $p < .05$ or less

indicated a significant finding. Multiple regression assumption checks were also undertaken. Scatter plots were generated to check for homoscedasticity and standard diagnostic tests were checked for extreme cases that might be influencing each model. Bonferoni corrections were applied to reduce type-one errors.

5.6.6: Path Analysis

To test for mediation between a predictor and outcome variable a path analysis based upon multiple regression analyses was undertaken. For mediation to occur Baron and Kenny (1986) state that (a) the predictor must significantly predict the mediator, (b) the predictor must significantly predict the outcome in the absence of the possible mediator, (c) the mediator must significantly predict the outcome. To test this criterion cognitive variables were regressed on the possible coping mediator to obtain path coefficients for predictors to coping. Second these predictors and the possible mediating coping variable were regressed on the outcome being tested. For the path diagram parameter estimates were calculated by the maximum likelihood (or ML) method to maximise the likelihood that the values obtained for the outcome variable in the path model were correctly predicted. The beta path coefficients obtained by the path model were checked to see if they replicated (or closely matched) those obtained by the multiple regressions analyse to see if they were a good fit. The estimated paths coefficients were used to estimate direct effects (no mediation involved), indirect effects (via a mediating variable) and total effects of the model (the sum of direct and indirect effects). Coping was a mediator if the direct effect of the predictor on the outcome was reduced upon the addition of the mediator. As recommended by Baron and Kenny (1986) the Aroian version of the Sobel mediations test was also used to test for significant indirect effects. The Sobel test (Sobel, 1982) is the sum of the square root of the raw unstandardised regression *B* coefficient weights and their corresponding standard error for both the predictor on the mediator variable and the mediator on the outcome variable. The Sobel statistic was calculated with a recognised interactive tool

(http://people.ku.edu/~preacher/sobel/sobel.htm). *P* <.05 indicates significant mediation.

5.6.7: Multivariate Analysis of Variance (MANOVA)

As multiple variables were being measured in study 6 over three time-frames, a repeated measures MANOVA was undertaken to allow the examination of differences between participants mean scores on combined outcome variables at 3 time points. Combining variables such as in MANOVA reduces type one error. To test MANOVA assumptions Pearson's correlations were undertaken on outcome variables to confirm that they were significantly correlated without showing multicollinearity. As this was a within-group design with each participant acting as their own control (i.e. within groups error variance is reduced) no Levene's or Box's M test was undertaken. However, Mauchly's test of sphericity was undertaken. A non-significant result (p >.05) indicates that within group variance is approximately equal and suitable for MANOVA. Even though fewer participants are required for within group designs, error is reduced and statistical power is increased, Pillai's Trace (V) was chosen as the preferred test statistic for the MANOVA analysis in light of the small sample size of this pilot study. A statistically significance result (p < .05) indicated a main effect for the intervention on the CU-specific outcome variables combined. The partial eta square or η^2 (i.e. the proportion of variance that one outcome variable explains when the other two are eliminated) was reported and the observed power of the analysis (.8 or above is suggested as a good level of power).

A significant MANOVA was followed up by individual one-way univariate repeated measure ANOVA's to establish which outcomes were significant. For each ANOVA the variance of the differences between scores from each participant was examined to see if they were equal as establishing multi-variate sphericity does not mean that the univariate ANOVA will also be spherical. Sphericity was again tested using Mauchly's test. A non-significant result (p > .05) indicates that sphericity has been established and the standard F ratio test statistic for within-group main effects can be trusted. If sphericity was violated for an ANOVA model the alternative

Greenhouse-Geisser corrected F ratio statistic was observed instead. A significant F ($P < .05$) indicates that a mean difference lies between timepoints. Again partial eta square (η^2) and power was observed. In order to establish where differences laid pairwise contrasts were undertaken to compare mean scores from (1) baseline to post-intervention (T1 verses T2), (2) post-intervention to follow-up (T2 verses T3) and baseline to follow-up (T1 verses T3) for each ANOVA. A Bonferoni correction was applied to pairwise analyses to reduce type one error.

5.6.8: Interpretive Phenomenological Analysis (IPA)

IPA was used to analyse the semi-structured interviews of women with CU. In IPA it is assumed that although ones cognitions cannot be directly accessed through their verbal accounts, they can be revealed through the IPA analytical process through the participants talk (i.e. transcripts). The IPA process is described in detail in Chapter 8.

5.7: Conclusions

The information in this chapter has described the general research methodologies employed throughout the remainder of the thesis to help answer its research questions and pre-study analyses and to test the psychometric performance of CU data in the standardised questionnaires used to assess their suitability. The next chapter presents a factor analysis of the IPQ-R and BMQ in CU.

Chapter 6:

Factor Analysis of the IPQ-R and BMQ-Specific in Chronic Spontaneous Urticaria (Study 3)

6.0: Rationale for Study

The Revised Illness Perception Questionnaire (Moss-Morris et al. 2002) and Beliefs about Medicines Questionnaire (Horne et al. 1999) were respectively developed to assess cognitive representations of illness and treatment however both had never been previously used in CU. The aim of this third study was to examine their internal reliability and factorial validity in CU to determine if they required psychometric adaptations before being used in proceeding studies.

6.1: Introduction

Illness perceptions are integral to the CSM because they act as exogenous latent factors that influence endogenous factors within the model (i.e. coping and outcome; Leventhal et al. 1980; 1984). Further a 45 study meta-analytic review (Hagger and Orbell, 2003) and proceeding studies support that they also inter-correlate in similar and predictable patterns across illnesses (See Chapter 2 for a full review). The IPQ-R (Moss-Morris et al. 2002) measures latent factors indicating illness perceptions and the (BMQ; Horne et al. 1999) further measures factors indicating beliefs about medications which has also been successfully replicated across chronic illnesses (see section 2.2.5, p31-33). In this third study it was hypothesised that in a CU sample:

1. The IPQ-R identity subscale would distinguish between Identity and somatisation.
2. The IPQ-R's four-factor cause structure would show good levels of internal consistency.
3. The IPQ-R's remaining seven-factor structure solution would be:
   (a) Identified by CFA and (b) Show good levels of internal consistency
4. The BMQ Specific 2-factor solution would be:
   (a) Identified by CFA and (b) Show good levels of internal consistency
5. CU representations overall would be held in patterns similar to other illnesses

6.2: Method

6.2.1: Participants

Recruitment

IPQ-R and BMQ study data collected for use in the proceeding cross-section study (Chapter 7: Study 4) was obtained from patients diagnosed with active CU. Participants were identified and recruited predominantly from St Thomas' Hospital's St Johns Institute of Dermatology in London. The hospital runs the only urticaria specialist clinic service in the United Kingdom and referrals are taken from general practitioners and other health professionals nationwide for patients of all ages and it is not uncommon for patients to travel from all over the UK hence the representation of patients by geographical location is vast. In order to establish a collaborative relationship and allow for access to participants, the thesis author initially contacted Dermatologists specialising in urticaria. More detailed recruitment strategies and procedures can be found in Study 4.

Sample Characteristics

A total of ninety participants were approached to take part in this study (see Table 6.1, p153). Of these five did not return postal surveys, three approached in the clinic refused to participate and one's data was removed due to being incomplete (> 30%). The final sample consisted of 81 participants, recruited from the outpatient urticaria clinic at St Thomas' Hospital's St Johns Institute of Dermatology. The majority were female and White British, in their mid-forties and were either married or co-habiting. Over half had either attended or completed a higher degree and slightly more were currently employed. The majority had experienced the condition for a median duration of 6.5 years but this ranged from 3 months to over 40 years. Age of CU onset varied but on average most believed that their urticaria had started in their mid-thirties with just over half reporting experiencing both and angioedema. The majority (> 70%) confirmed a diagnosis by their dermatologist. The majority had visited their GP twice in the past 6 months due to CU. Two-thirds were taking prescribed h_1 anti-histamines and other prescribed medicines. Only nine used dietary restrictions.

Table 6.1: Patient Characteristics

Variable	N	Percentage
Gender (%)		
Female/ Male	73.0/ 8.0	90.1/ 9.9
Age (years)	n/a	45.16 ± 14.04 (18 – 80)
Mean/ SD/ Range	65.0	80.2
Ethnicity (%)		
White British (%)	53	65.43
White European/ Other	3.0/ 13.0	7/ 1.2
Black/ Asian/ Mixed British	6.0/ 5.0/ 1.0	7.4 / 6.2 / 1.2
Education (%)		
None	14.0	12.30
GCSE/ O' level	91.0	7.30
GCE/ A' level	46.0	11.10
Higher Ed./ Degree	2.50	56.80
Not Specified	1.0	2.50
Occupational status (%)		
Employed	50.0	61.7
Unemployed	19.0	23.5
Retired	10.0	12.3
Studying	1.0	1.20
Not Specified	1.0	1.20
Marital Status (%)		
Single	21.0	25.9
Married/ Co-habiting	48.0	59.3
Divorced	3.0	3.70
Widowed/ Other	6.0/ 3.0	7.4/ 3.7
Initial diagnosing specialist		
General Practitioner	22.0	27.2
Dermatologist	59.0	72.8
Experience Angioedema		
Yes/ No/ Don't know or not sure	47/ 15/ 19	58.0/ 18.5/ 23.5
Age of onset (years)		
Mean/ SD/ CI	-------	34.65 ± 16.27 (95% CI, 31.03- 38.27)
Range (Inter-quartile range)	-------	1- 68.25 (25 years)
Disease duration (yrs)		
Median (range)	-------	6.5 (3 months – 40 yrs)
GP visits in past 6 months		
Mode (range)	-------	2 (0 -50)
Prescribed CU Medicines		
Anti-histamines	19.0	23.50
Anti-histamines with other	52.0	64.20
Other without anti-histamines	9.0	11.10
None	1.0	1.20
Dietary restrictions		
Yes/ No	9/ 72	11.1/ 88.9

6.2.2: Measures

This study uses IPQ-R and BMQ that measure representations of illness and treatment respectively (see Chapter 5, Section 5.4, p135-7 for a detailed review of both instruments).

6.2.3: Data Analysis

Patient characteristics were analysed using descriptive statistics. The internal consistency of the IPQ-R and BMQ subscales were calculated using Cronbach alpha. The instruments construct validity were analysed using factor analysis. Model fit was examined by Chi-square analysis (x^2) and goodness of fit indices. The identity subscale was subjected to reliability analysis and paired samples T-test to ascertain a difference between identity and somatisation. Inter-correlations between cognitions were analysed using Pearson's correlation coefficients. Full details can be found in section 5.6 (p145)

6.3: Results

6.3.1: Distribution of Study Variables

Exploratory data analyses of the IPQ-R and BMQ-specific study variables suggested the use of parametric statistical data analyses with the exception of the IPQ-R *personal control* subscale which showed significant kurtosis of 1.835 (z = 2.35, *SE .53*, p >.05) but non-significant skewness of -.46 (z = 1.7, *SE* .27, p <.05). The shape of its distribution curve suggested that this variable could be subjected to parametric tests but with caution to the interpretation of its findings.

6.3.2: Internal Reliability of the IPQ-R Identity Subscale

Participants attributed a mean number of 7.65 ± 3.77 symptoms to their CU (95% CI, 6.82- 8.49) as to 9.49 ± 4.08 symptoms they reported to have experienced since their CU began (95% CI, 8.59-10.40). To test that the identity subscale was measuring illness identity and not somatisation a paired samples t-test was conducted between both scores as recommended by the IPQ-R's authors (Moss-Morris et al. 2002). Both scores were significantly correlated (r=.75) but not enough to be measuring the same concept and this reflected in the significant difference between the two scores (t (5.53), p <.001).

Identity scores are illustrated in Table 6.2 below and show that the majority of participants reported wheals, pruritus and swelling as symptoms related to their CU. Other highly attributed symptoms included fatigue, sleep difficulties and pain however all symptoms were endorsed to some degree and with a Cronbach α of .84 the scale demonstrated a high internal consistency.

Table 6.2: Symptoms Attributed to CU

Symptom	n	%
Wheals*	78	96.30
Pruritus*	75	92.60
Swelling*	72	88.90
Fatigue	54	66.70
Sleep difficulties	49	60.50
Pain	44	54.30
Stiff joints	35	43.20
Breathlessness	34	42.00
Sore eyes	34	42.00
Loss of strength	27	33.30
Wheeziness	27	33.30
Dizziness	23	28.40
Headache	21	25.90
Upset stomach	21	25.90
Sore throat	17	21.00
Nausea	11	13.60
Weight loss	3	3.70

6.3.3: Internal Reliability and Structural Validity of the IPQ-R Cause Subscales

I) Internal Reliability

A reliability analysis of the original four factor solution of the IPQ-R cause subscale based on Cronbach alpha demonstrated good levels of internal consistency. The internal reliability (exception immunity cause; 50 and 67), closely replicated the IPQ-R's original alpha's for psychological cause (.80 in CU verses .86), risk factor cause (.70 verses .77) and accident/ chance (.22 verses .23).

II) Confirmatory Factor Analysis (CFA)

A CFA of the original IPQ-R cause subscales (represented in Figure 6.1, p157) suggested a significant difference between the present CU sample data solution and the hypothesised CSM four factor solution (X^2= 245.31, *df* = 129, *p* =.0001) indicating that a comparative fit between the two was not

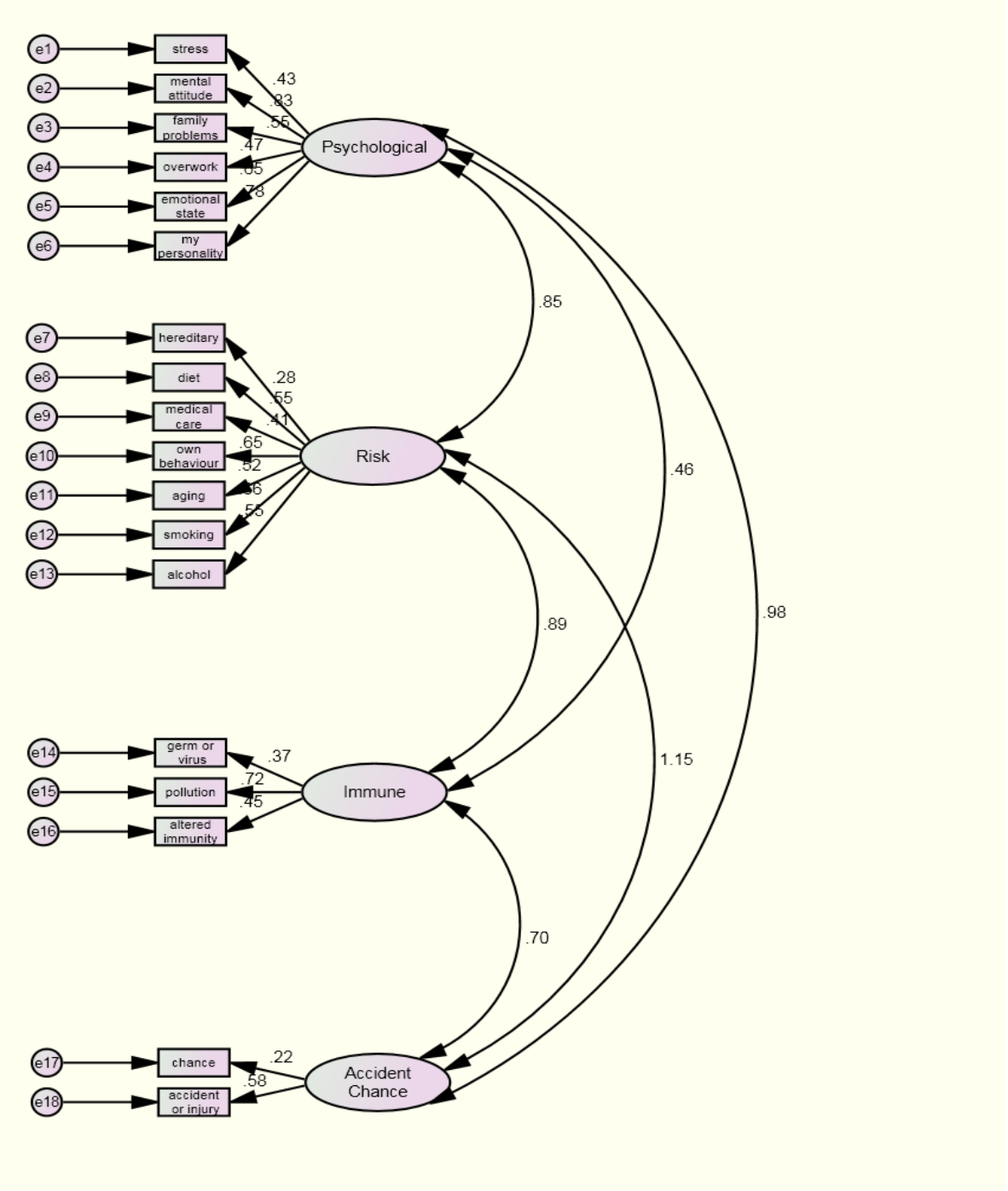
achieved. This lack of model fit was supported by an observation of the goodness-of-fit indices that also suggested a very poor model fit of the data. The NFI was .59, the CFI was .724, the RMSEA and itself confidence intervals were .11, (CI: .09 - .13) and RMSEA Close fit was .00.

III) Exploratory and Confirmatory Principal Components Analysis

As the CFA failed to achieve a comparable fit an exploratory PCA of the IPQ-R cause subscales 18 items was undertaken to examine the fit in the current CU sample. Further the instruments authors recommend such a procedure in order to explore how these individual causal items are constructed in new illness populations. In order to do this a principle components analysis (PCA) was undertaken using the orthogonal Varimax method with Kaiser Normalisation to rotate factors to a simple solution. The data reached the minimum KMO criteria for measuring sampling adequacy (MSA= .78) with 13 of the 18 individual KMO values falling above .7 (and others >.6.3). A Bartlett's test of sphericity (x^2 (153) = 539.413, p< .001) also indicated that the data was adequate for conducing PCA. Observing eigenvalues greater than 1 produced a six-factor solution accounting for 68.78% of the variance.

Component 1 consisted of 3 of the 7 risk factor items (smoking, own behaviour and alcohol), 1 item from the accident/ chance subscale (accident/ injury) and two high loadings of the psychological cause subscale. Component 2 loaded all 6 items that represented the psychological cause subscale however two of its items loaded better on component 1 (my mental attitude and personality). Component 3 consisted of 3 risk factor causes but one of these included a second but higher loading for alcohol from component 1. This component also presented loadings for two immunity cause items. Component 4 consisted of another risk factor item (medical care in past) and all 3 items that represented the immunity cause subscale but as just reported two of these also loaded on component 3. Component 5 consisted of a third loading for both personality and pollution together with the second accident/ chance item. The final component included a loading for another risk cause (hereditary) and a second small loading for the psychological cause overwork. Overall the psychological and immunity cause subscales were replicated by PCA but the risk and accident/ chance subscales were not.

Figure 6.1: Over-Identified Model of the IPQ-R Cause Subscales in CU



A fixed-four factor solution conducted to replicate the hypothesised subscales explained 57.08% of the variance in the CU sample and is illustrated in Table 6.3 (p.158). A comparison of the exploratory and confirmatory PCA showed marginal improvements with Component 1 now consisting of 4 of the 7 items that make up the risk factor scale, component 2 representing the psychological cause scale and component 4 items but immunity but evidently no identifiable component that represented the

Table 6.3: Principal Components Analysis of IPQ-R Cause Subscales

Item	Mean	S.D.	KMO	Component/ Eigenvalue/ % Explained			
				1	2	3	4
				5.66	**1.71**	**1.59**	**1.31**
				16.84%	**15.83%**	**13.69%**	**10.72%**
Smoking (R)	1.99	0.88	.800	.818			
Accident or injury (A)	2.03	0.84	.882	.711			
My personality (P)	2.13	0.96	.789	.687	**.496**		
My mental attitude (P)	2.36	1.02	.841	.644	**.526**		
Alcohol (R)	2.12	1.01	.766	.475		.422	
Family problems or worries (P)	2.76	1.16	.707		**.751**		
My emotional state (P)	2.65	1.05	.755		**.681**		
Stress or worry (P)	3.62	1.03	.773		**.653**		
Overwork (P)	2.68	0.96	.766		**.631**		
Diet or eating habits (R)	2.64	0.99	.702			.777	
Ageing (R)	2.31	0.92	.792			.665	
Altered immunity (I)	3.44	1.18	.639			**.655**	
A germ or virus (I)	2.45	1.03	.676			**.487**	
Poor medical care in my past (R)	2.09	0.90	.694				.671
Pollution in the environment (I)	2.64	1.05	.737			**.544**	.613
My own behaviour (R)	2.42	0.95	.827	.451			.548
Hereditary (R)	2.28	1.08	.671				.501
Chance or bad luck (A)	2.80	1.17	.635				-.433

Key: **R**: Risk, **P**: Psychological, **I**: Immunity, **A**: Accident/ Chance, **Highlighted section** Identified CU-related personality induced self-destructive behaviour cause construct

accident/ chance subscale. Component 1 did not represent a particular IPQ-R cause construct but its indicators of psychological and risk factor items (*smoking, my personality, my mental attitude, alcohol, my own behaviour*) was label as *induced self-destructive behaviour cause* with a Cronbach of α X. Factor provided no conceptual (or meaningful) categorisation of causes.

6.3.4: Internal Reliability and Structural Validity of the IPQ-R Seven Factor Subscale

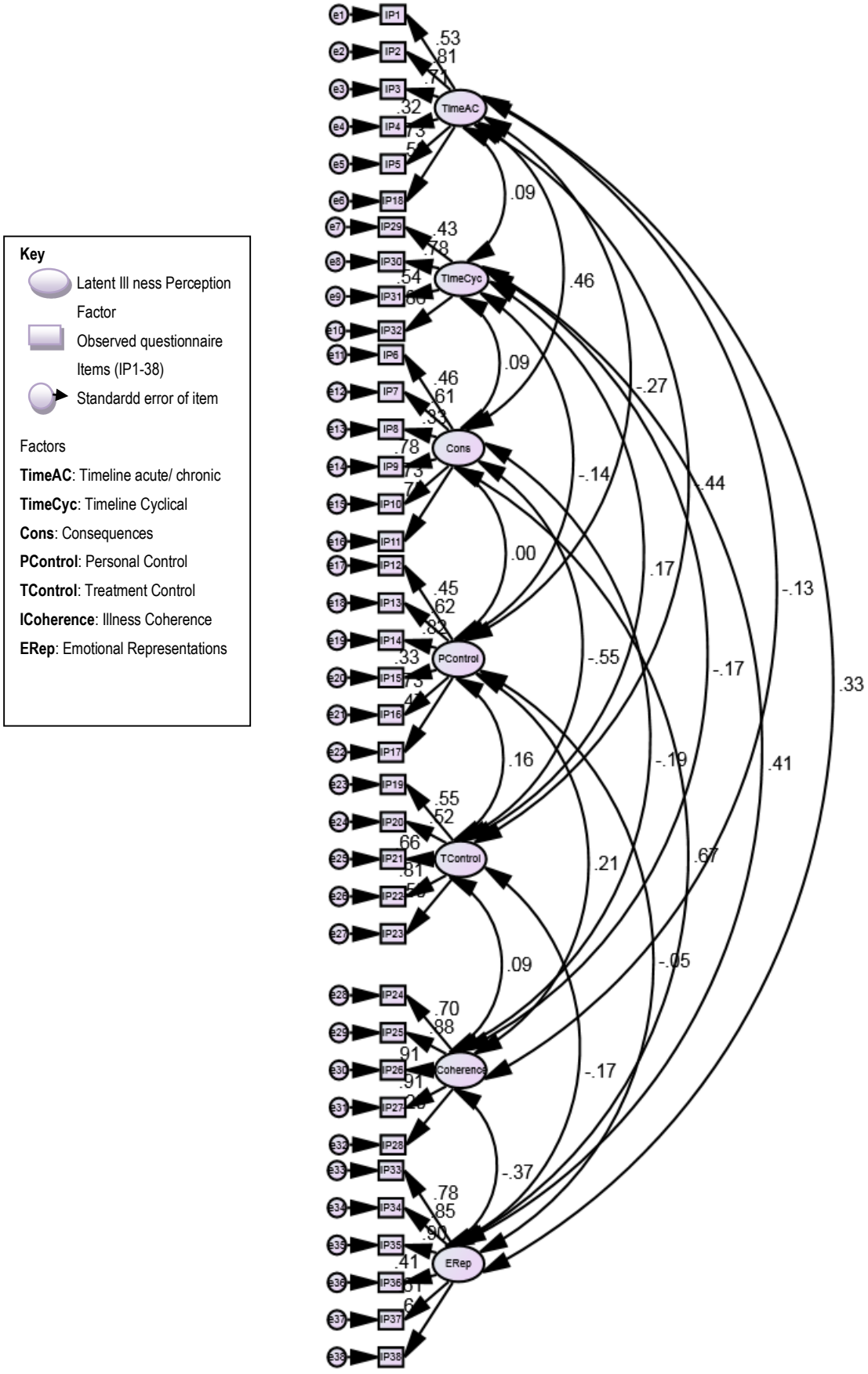
I) Internal Reliability: A reliability analysis of remaining IPQ-R subscales found good levels of internal consistency with Cronbach alpha coefficients of above .7 for all expect for emotional representations (.68). To establish how well the scores from the 38 items of the IPQ-R in the current CU sample fitted the 7-factor structure of the instrument a confirmatory CFA was undertaken.

II) Confirmatory Factor Analysis (CFA): A CFA of the IPQ-R 7 factor scale solution is illustrated in Figure 6.2 (p160). The CFA indicated a significant difference between the CU data solution and the hypothesised solution (X^2= 1130.62, *df* = 644, *p* = .0001) indicating that a comparative fit between the two was not achieved. This lack of fit was further supported by an observation of the goodness-of-fit indices where the NFI= .48, the CFI=.66, the RMSEA (.98, (CI: .09-.11) and RMSEA Close fit= .000.

III) Exploratory and Confirmatory Principal Components Analysis

As the CFA failed to achieve a comparable model fit an exploratory PCA of the IPQ-R seven factor solutions 38 items was undertaken to examine the fit in the current CU sample (see Table 6.4). As used by the IPQ-R authors an orthogonal Varimax method with Kaiser Normalisation was used to rotate factors to a simple solution. The data reached the minimum Kaiser-Meyer-Olkin (KMO) criteria for measuring sampling adequacy (MSA= .59) but shown in Table 6.3, 9 of the 38 items fell below the minimum .5 individual KMO value (questions 1, 6, 8, 15, 17, 28, 29, 30, 32). These items were kept to retain the original item structure of the questionnaire and however a Bartlett's test of sphericity (x^2 (703) = 1711.189, *p*<.0001) indicated that the data was adequate enough for conducting a PCA. The EFA using eigenvalues greater than 1, produced an 11-factor solution accounting for 74.6% of the variance.

Figure 6.2: Over-Identified Model of the IPQ-R 7-Factor Solution in CU



Component 1 contained 5 of the 6 items that represented the emotional representations subscale of the IPQ-R but also contained two loadings for three consequences items (Q9, 10 and 11). Component 2 consisted of 4 of the 5 items that represented the illness coherence subscale and a single loading of the remaining emotional representation item (Q36 *my CU doesn't worry me*). Component 3 contained 4 of the 6 items indicating the timeline acute/ chronic subscale and Component 4 retained all five items that represent the treatment control subscale. Component 5 consisted of 4 items of 6 of the consequences subscale, however two of these items also split loaded on component 1 (Q11 higher, Q10 lower) where a third consequence item singularly loaded (Q9). This component also featured a loading of the remaining timeline a/c item (Q18 *my CU will improve in time*). Component 6 consisted of 4 out of the 6 items indicating the personal control subscale and the remaining two items of this scale (Q15: nothing I do will affect my CU, Q17: my actions will have no affect on the outcome of my CU) loaded onto component 7 together will two second lower split loadings for two treatment control items (Q25, Q19). Component 8 loaded three timeline cyclical items with the remaining loading on component 10. Component 9 did not represent any subscale and consisted of a personal control (Q12: *there is a lot which I can do to control my symptoms*), consequence (Q6: *my CU is a serious condition*) and timeline a/c item (Q5: *I expect to have CU for the rest of my life*) The remaining component 11 contained a single loading for the remaining illness coherence item (QI *have a clear picture of understanding my condition*). Even though the data closely represented the IPQ-R subscales the exploratory PCA generated eleven factors not seven. The fixed 7 factor confirmatory solution (presented in Table 6.7) explained 61.84% of the variance but retained the exploratory PCA factor loadings for four subscales (i.e. illness coherence, emotional representations, consequences and personal control) and resulted in improvements in one. As shown in Table 6.4 (p162) component 5 now represented all four timeline cyclical items (as to three), however this also resulted in the treatment control items shifting from loading together being split between components 2 and 6 scale with consequence and treatment control items respectively.

Table 6.4: Principal Component Analysis of the IPQ-R Seven Factor Solution in CU

Item		Mean	S.D.	KMO	Component / Eigen value/ % variance						
					1	2	3	4	5	6	7
					4.47	3.81	3.65	3.54	2.75	2.73	2.56
					11.75%	10.03%	9.60%	9.31%	7.23%	7.18%	6.74%
35:	My CU makes me feel angry (**E**)	3.31	1.24	.798	**.801**						
38:	My CU makes me feel afraid (**E**)	2.88	1.23	.751	**.772**						
34:	When I think about my CU I get upset (**E**)	3.57	1.07	.657	**.761**						
33:	I get depressed when I think about my CU (**E**)	3.66	1.05	.675	**.709**						
11:	My CU causes difficulties for those who are close to me (**C**)	3.46	1.35	.639	.669	**.456**					
09:	My CU strongly affects the way others see me (**C**)	3.05	1.25	.753	.612	**.484**					
37:	Having CU makes me feel anxious (**E**)	3.57	1.01	.644	**.606**						
22:	My treatment can control my eczema (**TC**)	3.65	0.80	.709		-.699					
20:	My treatment will be effective in curing my CU (**TC**)	3.14	0.94	.622		-.679					
07:	My CU has major consequences on my life (**C**)	4.04	1.13	.533		**.652**					
10:	My CU has serious financial consequences (**C**)	3.08	1.36	.598	.425	**.614**					
18:	My CU will improve with time (**T a/c**)	2.92	1.06	.735		.485		**.481**			
21:	The negative effects of my illness....* (**TC**)	3.30	0.89	.589		-.466					
26:	I don't understand my CU (r) (**IC**)	2.88	1.15	.660			.885				
27:	My CU doesn't make sense to me (r) (**IC**)	2.78	1.14	.716			.874				
25:	My CU is a mystery to me (r) (**IC**)	2.64	1.14	.591			.864				
24:	The symptoms of my condition are puzzling to me (r) (**IC**)	2.59	1.24	.625			.789				
36:	My CU does not worry me (**E**)	3.92	0.99	.753		.426	-.531				
03:	My CU will last for a short time (**Ta/c**)	3.86	1.01	.544				.**795**			

Key: T a/c Timeline Acute Chronic, C Consequences, P Personal Control, T Treatment Control ***.....**can be prevented by my treatment

Table 6.4: continued

Item		Mean	S.D.	KMO	Component / Eigen value/ % variance						
					1	2	3	4	5	6	7
					4.47	3.81	3.65	3.54	2.75	2.73	2.56
					11.75	10.03	9.60	9.31	7.23	7.18	6.74
02:	My CU is likely to be permanent rather than temporary (**Ta/c**)	3.39	1.11	.618				**.768**			
01:	My CU will last a short time (**Ta/c**)	3.82	1.22	.370				**.657**			
05:	I expect to have CU for the rest of my life (**Ta/c**)	3.34	1.10	.630		.450		**.638**			
04:	This CU episode will last for a long time (**Ta/c**)	4.07	0.80	.599				**.605**			
08:	My CU does not have much effect on my life (**C**)	3.93	1.27	.467				.411			
06:	My CU is a serious condition (**C**) no load	3.70	1.03	.464							
30:	My symptoms come and go in cycles (**TCY**)	3.68	1.09	.457					**.845**		
32:	I go through cycles in which my CU gets better or worse (**TCY**)	4.02	0.95	.435					**.810**		
31:	My CU is unpredictable (**TCY**)	4.00	0.99	.512					**.638**		
29:	The symptoms of my illness change a great deal from day to day (**TCY**)	3.61	1.13	.375					**.539**		
15:	Nothing I do will affect my CU (**P**)	3.43	0.98	.377						.768	
17:	My actions have no effect on the outcome of my CU (**P**)	3.50	0.97	.385						.647	
19:	There is very little that can be done to improve my CU (r) (**TC**)	3.22	0.95	.627						.554	
23:	There is nothing which can help my condition (**TC**)	3.66	0.94	.635						.524	
28:	I have a clear picture of understanding my condition (**IC**) no loading	3.27	0.98	.469							
14:	The Course of my CU depends on me (**P**)	2.35	0.97	.575							.797
13:	What I do can determine whether my CU gets better or worse (**P**)	3.04	1.01	.504							**.787**
16:	I have the power to influence my CU (**P**)	2.69	1.02	.501							**.684**
12:	There is a lot which I can do to control my symptoms (**P**)	2.76	0.99	.549							**.484**

Key: T Treatment Control, IC Illness Coherence, TCY Timeline Cyclical, E Emotional Representations, r = reverse score

6.3.5: Internal Reliability and Structural Validity of the BMQ-Specific

I) Internal Reliability

A reliability analysis of the original two factor solution of the BMQ-Specific showed good levels of internal consistency with Cronbach alphas of .83 for necessity and .68 for concerns.

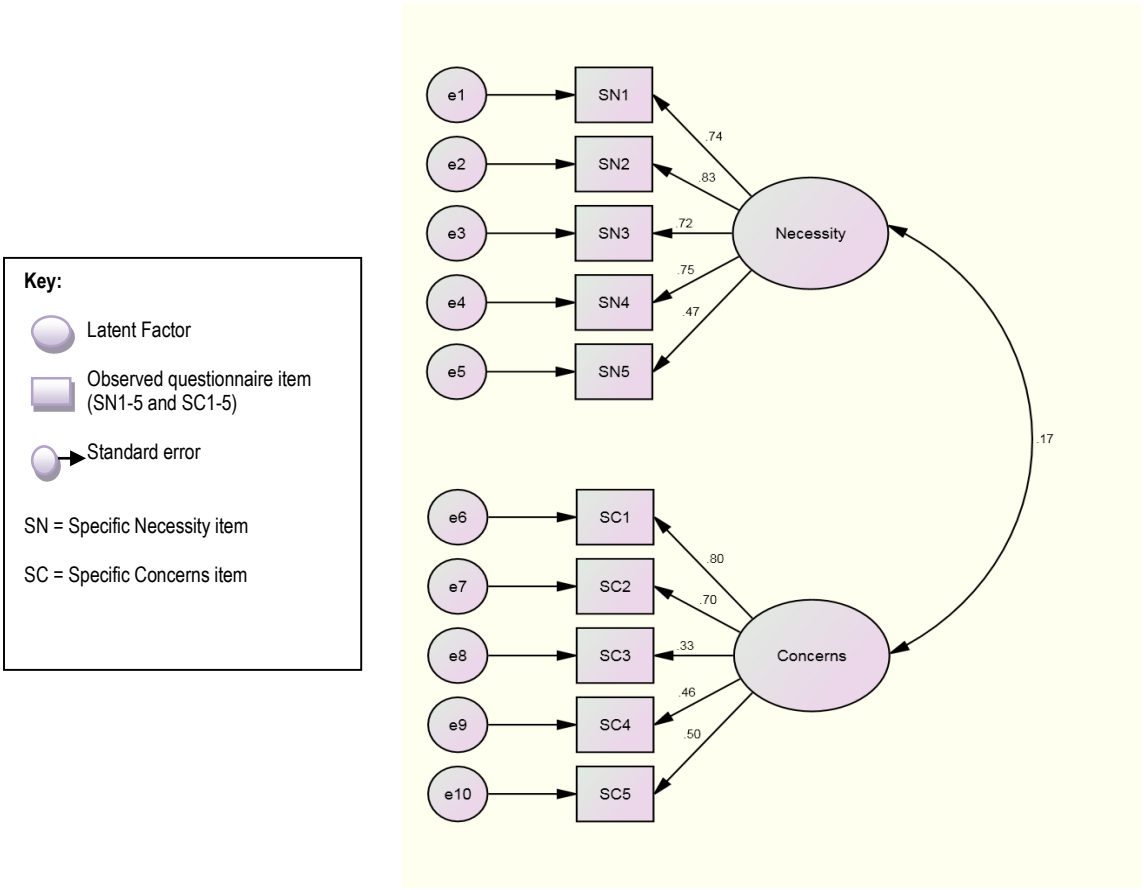
ii) Confirmatory Factor Analysis

A CFA of the BMQ-Specific subscales (shown in Figure 6.3, p165) suggested a significant difference between the CU solution and the hypothesised two-factor solution proposed by Horne et al. (1999) (X^2= 88.03, *df* = 34, *p* =.0001) indicating that a comparative fit was not achieved. This lack of model fit was further supported by an observation of the goodness-of-fit indices where the NFI= .71, the CFI .78, RMSEA (and its confidence intervals) .14, (CI: .11 - .18) and RMSEA Close fit= .00.

III) Exploratory and Confirmatory Principal Components Analysis

As the CFA failed to achieve a comparable model fit, an exploratory factor analysis (EFA) of the BMQ-Specifics 10 items was undertaken to examine the fit in the current CU sample. As used by the instrument authors (and to allow for inter-correlations between items) a non-orthogonal direct oblique rotation with Kaiser Normalisation was used. The data met KMO criteria for sampling adequacy (MSA= .67) with individual item KMO values exceeding .5 (except '*my CU medicines are a mystery to me'*, .38). Bartlett's test of sphericity (x^2 (45) = 286.71, *p*< .001) also suggested that the data was adequate enough for conducting a PCA. Accounting for 75.95% of the variance, the EFA using eigenvalues greater than 1 produced a 4-factor solution.

Figure 6.3: Over-Identified Model of the BMQ-Specific in CU



Component 1 consisted of four of the five items representing the BMQ specific necessity scale explaining 32.96% of the variance. Component 2 consisted of three loadings of items representing the BMQ specific concerns subscale and explained a further 21.16% of the variance, however one necessity item (i.e. '*my CU medicines protect me from becoming worse'*) and one concerns item (i.e. '*my CU medicines disrupt my life'*) loaded together on a third component explaining a considerable 11.5%. The remaining concerns item (i.e. '*my medicines are a mystery to me*') loaded by itself on a fourth component and explained 10.31% variance. The exploratory BMQ presented partial evidence to suggest the presence of separate necessity and concerns factors, however as this was not perfect a confirmatory fixed 2-factor solution was further investigated. For this analysis the fixed solution accounted for a reduced 54.12% of the variance but demonstrated an exact rotational match with all specific necessity and specific concerns items loading on components 1 and 2 respectively. This exact match is show in Table 6.5 on page 166.

Table 6.5: Fixed Principal Components Analysis of the BMQ-Specific in CU

Item	Mean	S.D.	KMO	Component / Eigen value/ % variance	
				1	2
				3.30	2.12
				32.96%	21.16%
Specific Necessity					
SN1: My life would be impossible without my CU medicines	3.65	1.09	.717	**.889**	
SN2: My health depends on my medicines	3.51	1.30	.833	**.793**	
SN3: My health in the future will depend on my CU medicine	3.20	0.99	.705	**.786**	
SN4: Without my CU medicines I would be very ill	3.51	1.19	.725	**.764**	
SN5: My CU medicines protect me from getting worse	4.03	0.85	.554	**.596**	
Specific Concerns					
SC1: Having to take CU medicines worries me	3.58	1.09	.651		**.844**
SC2: I sometimes worry about the long-term effects of my CU medicines	4.16	0.95	.632		**.773**
SC3: My CU medicines disrupt my life	2.96	1.13	.638		**.559**
SC4: I sometimes worry about becoming too dependent on my CU medicines	3.35	1.12	.628		**.571**
SC5: My medicines are a mystery to me	2.48	0.99	.378		**.501**

6.3.6: Inter-Correlations between Illness Perceptions and Treatment Beliefs

As shown in Table 6.6 (p168), inter-correlations between variables found logical patterns of relationships. The identity subscale strongly and significantly positively correlated with timeline acute/chronic (p<.01) consequences (p<.001) and specific necessity (p<.01) but no cause subscale. In contrast psychological causes strongly related to the other causes (all p< .01) and to a lesser extent emotional representations (p<.05). Immunity cause only positively correlated with the other causes (range p <.5 to .001) but accident/ chance significantly related to emotional representations (p<.01) and specific necessity (p<.05). Timeline acute/ chronic positively correlated with identity (p<.01), consequences (p<.001), emotional representations (p<.05) and specific necessity (p<.05), negatively with personal and treatment control (p<.05 and .01 respectively) but was not related to timeline cyclical (p> .05) which only strongly correlated to emotional representations (p .05). Consequences strongly and positively related to identity (p<.001), timeline cyclical (p<.001), emotional representations (p<.001), specific necessity (p<.01) and less for specific concerns (p<.05) but negatively for treatment control (p<.001). Personal control weakly correlated with treatment control (p<.05). Illness coherence bared strong negative relationships to emotional representations (p<.01) and specific concerns (p<.01). Emotional representations significantly correlated to all the other cognitions (ranging from p<.05 to .001) except for identity, risk factor and chance causes, and personal and treatment control (p> .05). Further specific necessity was strongly related to specific concerns.

Table 6.6: Inter-Correlations between Cognitive Representations

	ID	PSY C	RISK C	IMM C	ACC C	TIME (A/C)	TIME C	CON	P CON	T CON	IC	ER	SN	SC
Illness Identity (ID)		.141	.123	.040	.040	**.373****	.050	**.390*****	-.082	-.133	.011	.133	**.350****	.152
Psychological cause (PSY C)			**.569*****	**.302****	**.397*****	-.086	-.011	.005	.165	.062	-.207	**.248***	.191	.193
Risk factor cause (RISK C)				**.606*****	**.466*****	.006	-.083	.028	.213	-.068	-.090	.035	.148	.077
Immunity cause (IMM C)					**.281***	.000	-.007	.032	.029	-.148	-.018	.046	-.055	-.034
Chance cause (ACC C)						-.096	.158	.213	.097	-.025	.001	**.302****	**.287***	.094
Timeline-a/c (TIME A/C)							.070	**.453*****	**-.245***	**-.299****	-.054	**.278***	**.282***	-.113
Timeline cyclical (TIME C)								.170	-.164	.072	-.129	**.362****	.079	-.029
Consequences (CON)									-.090	**-.431*****	-.164	**.555*****	**.390****	**.227***
Personal control (P CON)										**.285***	.149	-.063	.014	.105
Treatment control (T CON)											.132	-.213	.049	-.107
Illness coherence (IC)												**-.341****	-.115	**-.294****
Emotional (ER)													**.332***	**-.297****
Specific necessity (SN)														.184
Specific concerns (SC)														

*P < .05, **P < .01, ***P < .001 Significant 2-Tailed (Bonferoni correction applied)

6.4: Discussion

This study examined the internal reliability and construct validity of the IPQ-R and BMQ-Specific in patients with CU using confirmatory factor analysis (CFA). It was hypothesised a priori that responses to items would be organised in such a way as to indicate the latent factors of illness and treatment perceptions. However despite the high levels of internal reliability presented by the instruments subscales, their hypothesised factor structures were not found by CFA. A possible explanation for this may be that the sample size was not adequate. However the goodness of fit indices not as affected by sample size also suggested a poor fit. An alternative explanation may lie in subtle structural schematic qualitative differences in how individuals with CU cognitively represent their illness. In light of this and an observation of residuals and modification indices (indicating the rejection of considerable numbers of items), it was decided to take an exploratory route via PCA. This made sense, as the studies sample size was adequate for conducting PCA on both instruments as originally undertaken by Moss-Morris et al. (2002) and Horne et al. (1999).

Through confirmatory PCA this study did provide strong evidence to support the theoretically derived dimensions of cognitive representations in CU for the first time by substantially replicating much of the structure of the IPQ-R and completely replicating those of the BMQ-specific. This major finding not only provides support that the instruments are capable of 'tapping' into cognitive representations of individuals with CU, but the inter-correlations between the dimensions also suggest that these individuals hold these representations of CU in similar logical and schematic patterns demonstrated by Hagger and Orbell's (2003) meta-analytic review.

IPQ-R identity subscale

One of the most supported dimensions was the identity subscale where the recommendation by its authors to add disease-specific symptoms further increased levels of

internal consistency. Further the addition of new symptoms to the IPQ-R by Moss-Morris et al. (2002) themselves was strongly supported in that all symptoms were endorsed to some degree by this patient population showing high internal consistency with or without the addition of CU specific items. However what made this finding more pertinent was that the subscale demonstrated an ability to dualistically establish that patients with CU were not reporting somatisation but that they were also cognitively labelling items that were both typical and atypical of CU symptomatology, a phenomenon previously overlooked by researchers. This finding has implications in that attributinh atypical somatic symptoms to CU may lead to reports of inappropriate coping behaviours and worse perceived outcomes as predicted by Leventhal's CSM. To qualify this, the IPQ-R identity subscale was used in proceeding Study 4, providing strong and significant statistical evidence to support that this is the case.

IPQ-R four factor cause subscale

The most supported subscale here was psychological attributions, which loaded all six of its indicator items onto a single factor. This construct was further supported in that the original seventh psychological cause *my own behaviour* did not load as a psychological factor but similarly loaded with other risk factors as it did in Moss-Morris et al.'s (2002) IPQ-R development study. Moss-Morris et al. (2002) do not explain this finding but a possible explanation is that the item *my own behaviour* is not a psychological item as labelled but actually a risk factor. When the risk factor subscale is observed further it contains *behaviours* that individuals do to themselves such as *smoking, drinking alcohol* and *eating* and although other items in this subscale such as *hereditary* and *aging* are not doing behaviours, they are processes that the body biologically does to itself. In contrast unlike Moss-Morris et al. (2002) the risk factor subscale demonstrated great instability in the current study in that its items loaded across three factors with my *own behaviour* itself split-loading across two of these factors. A closer observation of component one (consisting of risk factor and second loadings for two

psychological causes) resulted in a possibly meaningful categorisation of items for *my personality, my own behaviour*, *my mental attitude, smoking* and *alcohol* which was labelled as *personality induced self-destructive behaviours.* This labelling does appear to have some empirical support in the literature in that (as reviewed in Chapter 1, section 1.2.3) CU has long been associated with the pathological personality traits that are said to make them more susceptible to illness (Baiardini et al. 2011; Willemsen et al. 2008). Such *personality induced self-destructive behaviours* include alexthymia (i.e. difficulties in regulating emotions) indicated in up to 56.90% of CU inflicted individuals in one study by Barbosa et al. (2011) who also found this to be significantly related to exhibiting defence mechanisms that turn against the self and a need for external control independent of clinical variables (see section 1.2.3, p8 for studies supporting Barbosa et al. 2011). What is less supported in the literature is a role for smoking and alcohol abuse as an actual risk factor cause for the onset of CU. What is known is that alcohol use can worsen CU symptoms (Zuberbier et al. 2009b) and that both behaviours are both risk factors and coping strategies for dealing with stress in general (Moss-Morris e al. 2002; Carver, 1997). A first possible explanation can be proposed here in terms of a self-reported personality, attitudinal state and behavioural causal component perceived to be guiding the use of alcohol and smoking as a coping strategy. Such an explanation would be in line with the common-sense models concept of the IF-Then rule (Anderson, 1983; Brownlee et al. 2000) and its over-lapping nature. Regardless of alcohol and smoking being labelled in the model as perceived causal risk factors of CU onset, they can also be labeled, as coping behaviours hence there might be potential conceptual overlap. As described in depth Chapter 2 (section 2.2.4) illness perceptions guide coping actions but it can sometimes be difficult to establish which factors are the perception and which are the coping actions, hence *my personality, my own behaviour*, *my mental attitude* maybe illness perceptions *and smoking* and *alcohol* self-report coping actions representing overlapping concepts.

In another explanation using the IF-Then concept all items representing this factor could represent an actual causal perception (e.g. "*I believe my pathological personality, my negative mental attitude, my negative behaviour including drinking alcohol and smoking caused my CU"*) but they could also all be coping procedures (*I use my positive personality and mental attitude, alcohol and smoking as ways to cope with my CU*). A third explanation would involve the bi-directional nature of the IF-Then rule where the items are acting at times as both causal illness perceptions with corresponding coping actions in a bi-directional nature. It appears that further cross-validation of this subscale seems warranted in order to explore these possible explanations. For now it appears that individuals with CU think of their illness in terms of psychological attributions in line with the CU research literature that psychological aspects are the biggest cause of CU (e.g. O'Donnell et al. 1997; Berrino et al. 2006; Ozkan et al. 2007) but also in terms of particular psychological and risk factor indicators that represent a distinct CU specific causal attribution different to how the individuals in Moss-Morris' et al. (2002) represented them.

Another cause subscale with psychometric concerns was that of accident/ chance which was not replicated by PCA. A possible explanation for this may lie in its low internal consistency (α .22) suggesting that it could be eliminated as a subscale as it may not be adequate in tapping into this concept in CU. However the internal consistency of accident/ chance was equally low in Moss-Morris et al. (2002) at a = .23 and therefore in line with the scales original development. From the anecdotal evidence of illness perceptions reviewed in section 2.4.2 no indication of accident/ chance as a cause of CU was reported. In order to determine if this was a problem of low internal consistency or an irrelevant subscale, the responses of the open question part of the IPQ-R cause subscale was content analysed. Participants are asked an open question to rank what they believed caused their illness including those not listed. Responses could be themed into causes relating to stressful life events, medical/physiological or drug/chemical reaction

factors as shown in Table 6.7 below

The free responses showed a pattern more in line with psychological and immunity causes (stressful life events and medical/ physiological/ drug/ chemical respectively) indicating that accident/ chance causes is not a salient and significant causal attribution in those with CU. A descriptive survey analysis of this subscale in the next study may lead to more conclusive explanations for whether accident/ chance causes are important in CU. As the psychological cause construct was fully replicated, the immunity cause construct was also completely

Table 6.7: Participant Generated Causal Attributions of CU

Theme	Causal Atribution
Stressful Life Events	Childbirth, Pregnancy, Bereavement, Shock, Loss of job, Divorce, Going on airplane for first time, Work environment, Work-life balance
Medical / Physiological	Thyroid, Allergy, Blood, Hormones, Body going through cycles, Natural body secretion
Drug/ Chemical	Botox, Antibiotics, Medication, Flu injection, IUD, Insect bite abroad, chemical (e.g. hair dye), Weight gain

supported by PCA. From the research literature reviewed in Chapter 1 it is known that up to 50% of CU cases may be implicated in immunity factors (Kaplan and Greaves, 2009; Sabroe and Greaves, 2006) so it is possible that the subject of auto-immunity had been communicated to a large proportion of the research sample. Despite this successful replication two risk factor items loaded on the factor representing immunity causes. These risk factors were *eating behaviour* and *aging* which in the context of CU research could be explained by CU's history of being implicated in food allergy (Kulthanan et al. 2008) and the heuristic that the immune system becomes more compromised with older age (Miller and Maner, 2012).

In summary the PCA failed to replicate the four-factor causal attributions identified by Moss-Morris et al. (2002). From this study it can be concluded that the data only supported the

existence of psychological and immunity causes in CU, however this partial replication in itself is important in this context as CU is empirically implicated in evidence for both psychological and immunity factors also indicating that it is these factors that are collectively more cognitively salient to those with CU.

IPQ-R seven factor structure

By PCA the CU data largely supported the theoretical constructs of illness perceptions. The most strongly supported dimensions were those of the two timeline constructs, consequences, illness coherence and emotional representations subscales. The timeline acute/ chronic and timeline cyclical indicator items unanimously loaded onto two separate factors with high levels of internal consistency and a non-significant correlation between them, supporting the argument by previous researchers using the original unrevised IPQ (Weinman et al. 1996) that chronicity and cyclical timeline are not one entity and should be measured separately. In relation to this it also supports Moss-Moss et al.'s (2002) decision to split and re-assess the IPQ timeline subscale as they stipulate it more useful in conditions that do not follow a simple acute-chronic course such as autoimmune and skin conditions. In a CU context this makes sense as CU is medically known to be chronic both cyclical (Zuberbier et al. 2009a).

Secondly the addition of a new illness coherence subscale was supported as its indicator items loaded together on a single factor distinct from the other theoretical constructs, however discrepancies did occur. One illness coherence item failed to load in the seven-factor solution (i.e. *I have a clear picture of understanding my condition*). On further examination it became apparent that this item was the only one in this subscale worded positively and not reverse phased (see Table 6.3) indicating that this might require rewording in future. However a re-observation of the 11 factor exploratory PCA solution showed that this item loaded on its own as a single factor with an eigenvalue of 1.54 explaining 4.06% variance. As this item did not load this way in previous studies (Wittkoski et al. 2008; Moss-Morris et al. 2002; Hagger and Orbell,

2005) it appears more likely that this item represents a different and distinct latent factor to illness coherence or the other IPQ-R dimensions but this needs further.

Thirdly the data supported the graphical presentation and construction of Leventhal's CSM (see Figure 2.2, p26) in that all but one item/s indicating emotional representations (not included in the IPQ) loaded on its own factor separate to the other illness perceptions, therefore supporting that emotional representations are a separate entity. However the CSM proposes that emotional representations (ER) also inter-correlate with illness perceptions and an observation of Table 6.5 (p66) suggested that this was the case. Emotional representations correlated with all but a few illness perceptions and provided support for the extended CSM with significant relationships to specific necessity and concerns. Further findings from Study 4 in Chapter 7 provided further support in that ER predicted some CU-related outcomes independently of illness perceptions. In light of these findings it could not be ignored that two consequence indicators cross-loaded higher on this ER scale and further the one remaining ER indicator cross loaded elsewhere on the consequences factor and factor indicating illness coherence. In respect to the former Wittkoski et al. (2008) did find that the ER and consequences items consistently loaded onto a single factor in atopic dermatitis but as this was not the case in CU a more viable possible explanation is that the items '*My CU causes difficulties for those who are close to me'* and '*My CU strongly affects the way others see me'* might have been construed as an emotional related difficulties and affect from significant others, however their lower cross-loading on their representative consequences factor suggest that these difficulties and affects are still consequences (just more emotional ones). A second explanation maybe that there is conceptual overlap in these constructs as found by Hagger and Orbell (2005) who also found this these IPQ-R representations. Regarding consequences one of its indicators (i.e. *my CU is a serious condition*) did not load in the confirmatory PCA and loaded on a factor that appeared to have no conceptual meaning in the exploratory PCA (as removing this item in the analyses did not affect

the factor structure, it may be redundant in CU).

The findings of the control subscales added to the argument of whether curability/ control is a single dimensional construct or whether it should be separated into personal control and treatment control. Four of six personal control indicator items did load on their own factor but two items loaded onto another factor with two treatment control indicators providing conflicting evidence of personal control as a separate construct but with some conceptual overlap with treatment control as found in previous studies (Wittkoski et al. 2008; Hagger and Orbell, 2003; Moss-Morris et al. 2002). Interestingly the same two treatment control items that loaded with personal control items in CU (i.e. *there is very little that can be done to improve my illness* and *there is nothing which can help my condition*) were identical to that found in atopic dermatitis (Wittkoski et al. 2008) suggesting that in pruritic skin disorders at least this conceptual overlap occurs. Even though the treatment control items became destabilised in the fixed 7-factor PCA solution it did remain relatively intact in the exploratory PCA suggesting that it is a separate construct to personal control. The other treatment control items (*my treatment can control my* CU and *my treatment will be effective in curing my CU*) loaded negatively on the factor representing consequences (discussed earlier in relation to the ER item also loading). In a CU context antihistamine medicines and avoiding eliciting stimuli are first line interventions linked to serious consequences if not adhered to (see sections 1.4) and a possible explanation for this may be that patients with CU in this study could not separate or distinguish this relationship from the consequences. Evidence for this can be found in the strong correlation between these two factors (r .431, $p < .0001$).

BMQ-Specific/ inter-correlations

The extended CSM constructs of specific necessity and specific concerns (Horne, 1999; 2003) were strongly supported in that the fixed solution was a perfect rotational match (see Table 6.4). Even though it could be concluded that individuals with CU represent beliefs about

CU medicines as a two-dimensional construct, the exploratory PCA produced a four-factor solution loading one necessity and concerns item (*my CU medicines protect me from become worse* and *my medicines disrupt my life*) and a fourth containing a single item (*my medicines are a mystery to me*) with eigenvalues greater than one and considerable percentage variances of 11.5% and 10.31% respectively. If this alternative solution is accepted a possible interpretation of this is a specific necessity and concerns construct plus a third cognitive schema representing the necessity of CU medicines despite the burden they place on daily CU self-management (i.e. *cost-benefit dilemma*) and a fourth acting as a *treatment coherence* concept similar to that of illness coherence. In support of both possibilities studies have replicated the two-factor structure (e.g. De las Cuevas et al. 2011; Mahler et al. 2010; Lihara et al. 2010) but Fancis et al. (2009) took this a step further by examining the structure of the BMQ, a surgery-specific adaption (BSQ) and a third combining the BMQ and BSQ and not only replicated the generic two-factors but the specific BSQ items loaded on their own factors. Further support for these constructs come from Study 4 where patients reported equal necessity and concern beliefs supporting Horne's necessity-concerns differential (Horne, 2003) and logical inter-correlations with IPQ-R items respectively.

The strength of this study is that patients with a medically confirmed diagnosis of CU were recruited that despite being from a tertiary service, represented the patient characteristics that would be expected in this patient population (see section 1.3, p10) and the systematic review Study 1 in Chapter 3). Further the CU data used to conduct the PCA was taken from study 4 which had showed that both instruments have adequate psychometric properties in real research in respect to demonstrating an ability to predict CU-related outcomes (predictive validity) and follow the course of CU outcomes longitudinally (as demonstrated in Study 6) and this helps to counteract that the psychometric adequacy of the IPQ-R and BMQ are only based on the baseline cross-sectional data, however a limitation still pertains in that the structure of the IPQ-

R and BMQ-Specific could not be replicated using the more robust hypothesis testing CFA method even though this was rectified using statistical techniques (i.e. PCA) used by the instruments developers and still a powerful and commonly used analysis of construct validity of which most cognitive representation studies are based (Hagger and Orbell, 2003). Research outside this thesis could combine future CU data from the IPQ-R and BMQ-Specific to increase the possible sample size required for CFA that may result in a replication of their respective factor structures. Combining the items of the both instruments for factor analysis may also be a line of enquiry to establish if illness and treatment perceptions load on their own representative factors as in Fancis et al. (2009).

This is the first study to assess the factor structure of the IPQ-R and BMQ-Specific in CU and the findings provide preliminary evidence to suggest that both are adequate (if not perfect) tools for tapping into CU-related cognitive representations of illness and treatment. Researchers in future may want to explore the themes that emerged from structural discrepancies including the possibility of a CU-specific *personality induced self-destructive behaviour* causal attribution, treatment coherence and *cost-benefit dilemma* concept and the conceptual overlap between CU emotions and consequences in the quest for a perfect model fit of common-sense representations of CU.

Chapter 7

Exploring Cognitive Representations and Coping in CU-Related Quality of Life and Psychological Distress (Study 4)

7.0: Rationale for Study

The work reported in this study used the common-sense model as a theoretical framework to explore (I) the nature of cognitive representations in CU and (II) relationships between cognitive representations, coping and CU-related QoL outcomes. The findings are discussed in terms of developing interventions on changing the patient's illness model that might lead to better CU regulation.

7.1: Introduction

Illness perceptions are integral to the CSM (Leventhal et al. 1980; Leventhal, Nerenz and Steele, 1984) that proposes that individuals simultaneously deal with their perception of illness and emotional responses to it. These processes are said to influences illness outcomes mediated by coping behaviour. Studies have either established partial mediation (e.g. Rutter and Rutter, 2002), failed to find mediation (e.g. Scharloo et al. 2005; Kaptein et al. 2006) or have omitted measuring coping altogether (e.g. Timmers et al. 2008). As this was the first exploration of the CSM in CU all avenues were explored. Treatment perceptions (Horne, 2003) were also studied in relation coping and outcome. The studies research hypotheses were to:

1) Confirm that CU had a moderate negative impact on quality of life
2) Confirm that poorer CU-related on quality of life would be significantly related to high levels of psychological distress.
3) Individuals with CU would hold cognitive representations of their illness
4) CU-related cognitive representations would be significantly related to coping behaviour
5) CU-related representations would be significantly related to QoL and psychological distress
6) The relationship between representations and outcome would be partially mediated by coping.

7.2: Method

7.2.1: Design

This cross-sectional survey required participants to complete questionnaires exploring: *cognitive representations, coping behaviour, anxiety, depression, general health status*, *disease-specific quality of life* and *participant characteristics*.

7.2.2: Participants

Participants had a confirmed diagnosis of chronic spontaneous urticaria and were recruited at St. John's Institute of Dermatology, Guy's and St. Thomas' NHS Trust. The sample size required was estimated at 82 participants and was established using the programme G Power 3 (Faul, Erdfelder, Lang and Buchner, 2007) based upon correlation analyses, a medium effect size, a power of 0.8 and probability value of .05 two-tailed. The full recruitment process is reported in section 5.3.1 (p134).

7.2.3: Measures

The measures used in this study were the study-specific *You and Your Urticaria Questionnaire, IPQ-R,* BMQ, *Brief COPE*, HADS, SF-36v2 and the *CU-Q_2oL*. Detailed information on instruments can be found in Section 5.4, (p135).

7.2.4: Procedure

Participants completed questionnaires in one of two strategies, which are described below.

Outpatient Clinic

Patients were informed by their Dermatologist about the study being undertaken and if they would be interested in finding out more from the chief investigator (CI). Those confirming an interest were introduced to the CI in a private room. The Dermatologist presented the patient to the CI by name, current diagnosis and current disease status. The CI introduced herself and provided a description of the study and asked if they wanted to know more. Patients were provided with a participant information sheet (PIS) to read and keep and given the opportunity to ask questions. Those declining were informed that they

could contact the CI using the contact details on the PIS if they changed their mind. Those agreeing tp participate completed and signed a consent form. Patients were then given the questionnaires to complete read and told to read the instructions carefully.

Postal Procedure

Patients were contacted by phone by the clinics administration team who asked for permission for the CI to contact them. The CI contacted those who agreed by phone and explained the purpose of the call. Agreeing patients were informed about the study, sent the PIS, consent form, questionnaires and a stamped reply envelope. Declining patients were thanked for their time

7.2.6: Data Analysis

Relationships between variables were explored using correlational analysis. Hierarchical linear multiple regression were used to determine the contribution of patient characteristics, cognitive representation and coping factors on 5 self-regulatory models of CU outcome. Path analysis based on multiple regression analyses were undertaken to test coping as a mediator of representations and outcome. Model fit was examined by Chi-square analysis (x^2) and goodness of fit indices. Bonferoni corrections were applied to reduce type one error when doing multiple comparisons. Further details on all analyses can be found in section 5.6 (p145)

7.3: Results

7.3.1: Exploratory Data Analysis

Exploratory data analyses suggested the use of parametric statistical data analyses with the exception of the variables *disease duration* and *GP visits in the past 6 months*, the Brief COPE *negative cognitive appraisal*, the SF-36v2 general health variable *physical functioning* and the CU-Q_2oL's *swelling, impact on life activities* and *looks* which were all significantly skewed. Removing outliers and extreme scores did not improve skew. The CU-Q_2oL variables *pruritus* and *limits* appeared normally distributed but observations of their associated histogram and stem-and-leaf plots suggested that they might be of a

near bimodal distribution. Two further SF-36v2 subscales *role physical* and *body pain* were not significantly skewed but showed kurtosis with a build-up of scores on the right side of the distribution in line with *physical function*. It was decided that these variables would be explored using non-parametric statistics. The final two variables of concern, the IPQ-R *personal control* and SF-36v2 *physical component summary* (PCS) showed significant kurtosis. Their non-significant skew and the shape of their distributions curve suggested that they could be subjected to parametric tests but with caution in interpreting their findings.

7.3.2: Patient Characteristics

Participant data for Chapter 6 was used for this study. In summary, the study consisted of 81 participants of whom the majority were female (90.1%), White British (80.2%), married or co-habiting (59.3%), employed (61.7%) with a mean age of 45.16 ± 14.06 years (95% CI, 42.04- 48.29, range 18- 80 years) and age of onset 34.65 ± 16.27 years (95% CI, 31.03- 38.27). The majority were taking h_1 anti-histamine medicines alongside additional medications (64.2%).

Relationships between Patient Characteristics and Study Variables

Inter-correlations between patient characteristics and the study variables found numerous relationships: Younger patients were more likely to believe in accident/ chance causes (r = .22, *p*< .05), attributed a higher number of symptoms to their condition (r = -.26, *p*<.05), perceived CU to have more serious consequences (r = -.27, *p*<.05) but reported better levels of disease-specific QoL (r = -.42, *p*<.05). The remaining socio-graphic variables did not relate to the main study variables but exceptions were found. For ethnicity not being white was strongly and significantly related to a chronic timeline (r_{pb}= -.28, *p*<.01) and poorer personal control (r = -.28, *p*<.01); poorer educational status to a necessity to take CU medicines (r_{pb}= -.32, *p*<.01) and being employed to the use of support resources coping (r_{pb}= .22, p <.05). Further being married was significantly related to less psychological cause perceptions (r_{pb}= -.22, *p* =.03), better general mental health status (r_{pb}= .27, p =.05) and better disease-specific QoL (r_{pb} = -.29, *p* =.01). Gender was not explored due to the 9:1 ratio of female participants.

In terms of clinical characteristics those who developed their disorder earlier in life (i.e. age of onset) and hence had been experiencing CU longer also strongly and significantly reported a higher illness identity (r = -.3, *p*< 01) and more serious consequences (r = -.28, *p* =.01). Further experiencing angioedema was related to a chronic timeline (r_{pb} =.22, *p* =.05) and taking CU medicines was significantly related to both a necessity to take CU medicines (r_{pb} = -.27, p<.02) and better general physical health status (p<.05). Finally dietary restrictions were significantly related to concerns about CU medicines (r_{pb} = -.26, p =.05) and positive cognitive appraisal coping (r_{pb} = -22, p <.05). Risk factor and immunity causes, timeline cyclical, treatment control, illness coherence, emotional representations, proactive coping, use of support resources and depression were unrelated to patient characteristics.

7.3.3: CU Outcome: Quality of Life and Psychological Distress

The results of CU-related outcome are presented in Table 7.1 on page 184. On observation of Table 7.2 over a third reported poorer than average general physical and mental health status. However the overall distribution of scores suggested a moderate overall impact. A paired samples t-test confirmed that both aspects did not significantly differ from each other (*t* (1, 87), p >.05). Findings for disease-specific QoL mirrored health status with 35.6% reporting worse than average QoL and a moderate impact. CU appeared to impact appearance as much as physical aspects with poorer than average scores of 48.1% and 43.2% for pruritus and sleep problems respectively and 48.7% for looks. A post hoc Wilcoxon signed-rank test confirmed that pruritus and sleep problems did not significantly differ from looks but they did when compared to other QoL aspects. Psychological distress was prevalent with possible/ probable anxiety totalling 65.2% and 35.0% for depression.

Table 7.1: Quality of Life and Psychological Distress in CU

Subscale* (n- 81)	**Mean/ SD (CI 95%, lower- upper)**	**Scale Scores Percentage**		**α**	**Skew/ Error**	***Z***	**Kurtosis/ Error**	***Z***
		Worse than average Unless otherwise stated	**Better than average** Unless otherwise stated					
Psychological Distress								
Anxiety*	9.45 ± 4.52 (CI 95%, 8.44 -10.45)	28.90 possible disorder	36.20 probable disorder	.84	0.36/ 0.27	1.35	-0.21/ 0.53	-0.40
Depression*	6.55 ± 4.54 (CI 95%, 5.54 - 7.56)	16.30 possible disorder	18.70 probable disorder	.87	0.52/ 0.27	1.92	-0.60/ 0.53	-0.13
General Health Status								
General physical health**	60.28 ± 23.83 (CI 95%, 55.01 - 65.55)	35.80	64.20	.83	-0.20/ 0.27	1.51	-1.08/ 0.53	-0.20
General mental health**	57.04 ± 21.63 (CI 95%, 52.25 -61.82)	38.80	60.50	.85	0.01/ 0.27	0.04	-0.97/ 0.53	-1.83
Disease-Specific Quality of Life								
Overall	42.52 ± 23.74 (CI 95%: 37.27- 47.77)	35.60***	64.20	.89	0.71/ 0.27	0.27	-1.02/ 0.53	1.93
Aspects of Disease-Specific QoL								
Pruritus		48.10	40.70	.90	-0.04/ 0.27	-0.15	-1.22/ 0.53	-2.30
Swelling		16.00	74.10	.79	0.99/ 0.27	3.70***	-0.04/ .53	-0.07
Impact on life activities		34.60	60.50	.91	0.41/ 0.27	1.52	-1.14/ 0.53	2.10*
Sleep problems		43.20	50.60	.70	0.04/ 0.27	0.14	-1.03/ 0.53	1.94
Limits		32.10	61.70	.72	0.34/ 0.27	1.27	-0.79/ 0.53	-1.50
Looks		48.70	49.40	.84	0.06/ 0.27	0.24	-1.32/ 0.53	-2.50*

Anxiety and depression* 8-10 = possible clinical disorder and 11-21= probable clinical disorder, **General health status**** 0= worse than average – 100= better than average
Quality of life*** 0= better than average – 100= worse than average
Skewness and/ or Kurtosis: *Z=1.96= Sig <.05 **Z=2.58= Sig <.01 ***Z=3.29 =Sig <.001

When generic health status and disease-specific QoL domains were subjected to non-parametric correlation analysis a strong and significant negative relationship was found between the two concepts where those who reported lower than average generic health status also reported below average levels of disease-specific QoL. These findings confirmed the good convergent validity of the CU-Q_2oL on SF-36v2 found in study 2.

7.3.4: Cognitive Representations

Illness Identity

The majority of participants identified wheals (96.3%), pruritus (92.6%) and swelling (88.9%) as symptoms related to their CU. Atypical symptoms included upset stomach (25.9%), headaches (25.9%) and sore throat (21.0%). The full list of CU symptoms can be found in Study 3 (Table 6.2, p155)

Causal Attributions

As presented in Table 7.2 (p186), almost two-thirds believed that their CU was caused by stress and nearly half reported the cause as altered immunity. Further a third reported that it was caused by chance (33.8%). When participants were asked if if they could think of any other factors that they believed may have caused their CU, their responses could be categorised into causes relating to stressful life events, medical/physiological or drug/chemical reaction factors. These item can be observed in the previous chapter (see Table 6.7, p173)

Table 7.2: Causal Attributions of Chronic Urticaria

Cause (α)	**N**	**Scale Scores (%)**	
		Strongly agree/ Agree	Strongly disagree/Disagree
Psychological (.80)			
Stress or worry	81	64.20	16.00
My mental attitude	80	12.60	62.50
Family problems or worries	80	26.30	42.50
Overwork	80	21.30	42.50
My emotional state	80	25.00	50.00
My personality	79	08.90	69.60
Risk factors (.70)			
Hereditary	80	17.50	66.30
Diet/ eating habits	79	20.20	51.90
Poor medical care in my past	81	06.20	76.50
Own behaviour	79	13.90	58.20
Ageing	80	11.30	63.80
Smoking	80	06.30	76.30
Alcohol	80	08.80	72.00
Immune (.50)			
A germ or virus	79	16.50	53.20
Pollution in the environment	81	16.00	43.20
Altered immunity	79	49.30	22.80
Accident or chance (.22)			
Chance or bad luck	80	33.80	40.00
Accident or injury	80	05.00	75.00

*Scale: 1 strongly disagree – 5 strongly agree

Other Cognitive Representations

For the remaining perceptions (Table 7.3, p187) participants believed their CU to be a chronic and cyclical condition (>90%) with serious consequences (87.5%) and reported high emotional representations (87.7%). Forty-four percent reported having no personal control and similar proportions agreed (35.0%), disagreed (31.3%) or were undecided (33.8%) about whether what they did made symptoms better or worse. Beliefs in the necessity of taking CU medicines (88.6%) equalled concerns (87.3%) and 38.8% reported having a low illness coherence overall.

Table 7.3: Descriptive Summary of Cognitive Representations of CU

Self-regulatory variable	Items	Mean (S.D.)*	95% Confidence interval		Scale Scores Percentage		Distribution				
			Lower Bound	Upper Bound	Strongly agree/ Agree	Strongly disagree/ Disagree	α	Skew/ Error	Z	Kurtosis/ Error	Z
Illness/ Treatment n= 81/											
Psychological Cause	6	2.70 ± 0.73			52.50	35.00	.80	0.37/ .27	1.39	.020 / .53	0.04
Risk Factor Cause	7	2.79 ± 0.78			29.10	70.00	.70	0.17/ .27	0.62	-0.25/ .54	-0.46
Immunity Cause	3	2.22 ± 0.57			67.50	32.00	.50	-0.37/ .27	-1.39	-0.20/ .53	0. 38
Accident/ Chance Cause	2	2.50 ± 0.83			41.20	42.50	.22	0.29/ .27	0.69	0.49/ .53	0.39
Consequences	6	3.61 ± 0.79	3.43	3.76	87.50	10.00	.79	-0.39/ .27	-1.46	-0.29/ .54	-0.54
Timeline: acute/ chronic	6	3.61 ± 0.82	3.43	3.79	90.00	07.50	.78	0.02/ .27	0 .07	0.26/ .53	0.49
Timeline cyclical	4	3.91 ± 0.70	3.75	4.07	91.20	05.00	.75	-0.52/ .27	-1.90	-0.16/ .54	0.30
Personal control	6	2.95 ± 0.66	2.80	3.09	76.20	15.00	.75	-0.46/ .29	1.70	1.84/ .53	3.45**
Treatment control	5	3.41 ± 0.65	3.26	3.55	95.00	05.00	.73	0.16/ .27	0.58	-0.28/ .53	-0.53
Illness coherence	5	2.83 ± 0.93	2.62	3.04	61.20	38.80	.84	0.03/ .27	1.19	-0.56/ .53	-1.05
Emotional responses	6	3.49 ± 0.82	3.32	3.68	87.70	12.30	.66	-0.16/ .27	-0.60	-0.05/ .53	-0.09
Specific necessity	5	3.63 ± 0.80	3.44	3.81	88.60	11.40	.83	-0.46/ .27	1.68	-0.46/ .54	0.86
Specific concerns	5	3.29 ± 0.74	3.13	3.46	87.30	12.70	.68	-0.21/ .27	-0.76	-0.23/ .54	-0.42

Skewness and/ or Kurtosis: *Z=1.96 = Sig < .05 **Z=2.58 = Sig <.01 ***Z=3.29 =Sig < .001

Interrelationships between cognitive representations are examined in Study 3 (Table 6.6, p168). In summary these showed patterns of relationships as would be predicted by the CSM.

7.3.5: Coping

As shown in Table 7.4a the most reported was acceptance (80.1%). Other popular strategies included *active coping*, *planning*, *using instrumental social support* and *self-distraction* and humour. The least reported were *substance use* and *denial* but all strategies were reported by a quarter of participants.

Table 7.4a: Self-Reported Coping Behaviours

A-priori Cope Subscale	N	Percentage reporting behaviour		α
		Above scale mid-point Use a lot/ Medium amount	**Below scale mid-point** Coping strategy not used	
Acceptance	80	**80.10**	02.50	.67
Active Coping	79	**72.20**	07.60	.65
Planning	80	**68.70**	17.50	.75
Instrumental. Social Support	80	52.50	22.50	.57
Self-Distraction	79	49.40	24.10	.46
Emotional Support	80	42.50	22.50	.83
Humour	80	36.20	33.80	.85
Positive Reframing	80	30.00	31.30	.79
Venting	80	27.50	36.30	.71
Religion	80	25.00	65.00	.67
Self-Blame	80	23.70	48.80	.77
Behavioural Disengagement	80	20.00	48.80	.55
Denial	80	13.70	72.50	.81
Substance Use	80	06.20	81.30	.87

The second-order PCA of the 14 subscales are presented in Table 7.4b. This PCA generated a four-component structure with eigenvalues greater than one and accounted for 69.63% of the variance. These were labelled *Pro-active*, *Positive cognitive appraisal*, *Negative cognitive appraisal* and *Use of support resources*. Over three quarters of participants reported using proactive coping and 41.5% positive cognitive appraisal strategies such as acceptance suggesting that large proportions were not. In contrast only 13.7% used negative cognitive appraisal strategies such as denial and self-blame and only a third reported using support resources.

Table 7.4b: Descriptive Summary of Second Order COPE Subscales in CU

Coping component	Items	Mean/ S.D.■	95% Confidence interval		Scale Scores Percentage		Distribution			
			Lower Bound	Upper Bound	Strongly agree/ Agree	Strongly disagree/ Disagree	Skew/ Error	*Z*	Kurtosis/ Error	*Z*
Proactive coping	4	4.93 ± 1.52	4.59	5.27	71.60*	28.4	-0.19/ 0.27	-0.72	-0.71/ 0.53	-1.34
Negative cog appraisal	4	3.30 ± 1.39	2.99	3.60	13.70*	86.3	1.43/ 0.27	5.32	1.87/ 0.53	3.51
Positive cog appraisal	3	4.60 ± 1.51	4.27	4.82	41.50*	58.5	0.41/ 0.27	1.54	-0.46/ 0.53	-0.89
Support resources	2	4.45 ± 1.64	4.09	4.94	31.20	68.8	0.08/ 0.27	0.30	-0.88/ 0.53	-1.65

Second order PCA of Brief COPE subscales statistics: KMO criteria for measure of sampling adequacy= .73, Bartlett's test of sphericity = (x^2 (66) =.346.27, *p*< .001)

■ **Skewness and/ or Kurtosis:** *Z=1.96 = Sig < .05 **Z=2.58 = Sig <.01 ***Z=3.29 =Sig < .001

Key:

Pro-active Coping: Active coping, Self-distraction, planning;

Positive cognitive appraisal coping: Humour, acceptance, positive reframing,

Negative Cognitive Appraisal Coping: Behavioural disengagement, self-blame, denial, venting;

Use of Support Resources: Use of instrumental social support, use of emotional support

7.3.6: Cognitive Representations and Coping

As highlighted in Table 7.5a (p191), cognitive representations were generally not related to coping but those who reported a strong illness identity and high emotional representations reported significantly greater use of proactive coping behaviours. However strong relationships were also found between a high illness identity, high emotional representations and the use of negative cognitive appraisal coping. All casual attributions (except chance) related to a greater use of proactive coping behaviours but psychological attributions were also significantly related to the use of negative cognitive appraisal coping. Serious consequences were also strongly related to negative cognitive appraisal coping (Table 7.5b, p191). A further three relationships found significantly positive relationships between illness coherence and use of positive cognitive appraisal coping, and high treatment control and emotional responses to a greater use of support resources.

Table 7.5a: Linear Relationships between Cognitive Representations and Coping Behaviours*

	Identity	Psych Cause	Risk Cause	Immunity Cause	Chance Cause	Timeline (a/c)	Timeline Cyclical	Consequences	Personal Control	Treatment Control	Illness Coherence	Emotional Responses	Specific Necessity	Specific Concern
Pro-Active Coping	.319**	.227*	.277*	.287**	.129	.104	-.072	.066	.211	.006	.055	.267*	.137	.207
Pos. Cog. Appraisal	.174	.181	.177	.207	.170	.012	.052	-.005	.091	.202	.241*	.073	.011	-.025
Use of Support	-.145	.012	.036	.054	.059	.107	.087	.030	.165	.240*	.043	.224*	.102	-.173

*p< .05, **p< .01, ***p< .001 Significant 2-Tailed (Bonferoni correction applied) *Pearson's r

Table 75b: Non-linear Relationships Negative Cognitive Appraisal Coping*

	Identity	Psych Cause	Risk Cause	Immunity Cause	Chance Cause	Timeline (a/c)	Timeline Cyclical	Consequences	Personal Control	Treatment Control	Illness Coherence	Emotional Responses	Specific Necessity	Specific Concerns
Neg. Cog. Appraisal	.226*	253*	.196	.058	.165	.215	.172	.348**	-.067	-.115	-.133	.490***	.153	.215

*p< .05, **p< .01, ***p< .001 Significant 2-Tailed (Bonferoni correction applied) *Spearman's Rho

Pro-active Coping: *active coping, self-distraction, planning*;

Positive cognitive appraisal coping: *humour, acceptance, positive reframing*,

Negative Cognitive Appraisal Coping: *behavioural disengagement, self-blame, denial, venting;*

Use of support resources: use of instrumental social support*, use of emotional support*

7.3.7: *Cognitive Representations and Outcome*

As illustrated in Table 7.6a below perceptions of serious consequences presented as the strongest and most significant correlate of all outcomes bearing relationships to higher anxiety (p <.001), higher depression (p <.001), poorer general physical (p <.001) and mental health status (p <.001) and poorer disease-specific QoL (p <.001). Strong relationships were also found between a high illness identity, high emotional representations and outcome were correlations between psychological adjustment were always positive and QoL poorer than average. High chronicity and specific necessity beliefs presented a similar pattern but were unrelated to general physical health status and anxiety respectively. Specific concerns about CU medicines were related to higher levels of depression (p <.01), poorer general physical (p <.01) and mental health status (p <.01).

Table 7.6a: Relationships between Cognitive Representations and Outcomes

	Anxiety	Depression	General PH*	General MH*	Overall QoL
Illness Identity.	**.373****	**.426*****	**-.582****	**-.522*****	**.577*****
Psychological cause.	**.272***	.100	-.039	**-.230***	.123
Risk cause	.191	.080	-.063	-.158	.089
Immunity cause	.031	-.021	.019	-.008	-.022
Chance cause	.224*	.114	-.060	-.147	.052
Timeline-acute/chronic	**.259***	**.260***	**-.289****	**-.289****	**.589*****
Timeline cyclical	.114	.013	-.004	-.022	.101
Consequences	**.361*****	**.448*****	**-.497*****	**-.434*****	**.555*****
Personal control	.188	-.128	-.080	-.067	-.065
Treatment control	-.174	**-.360****	.208	**.241***	-.216
Illness coherence	-.163	-.208	.109	.191	-.168
Emotional Represent.	**.494*****	**.386*****	**-.297****	**-.397*****	**.385****
Necessity	.214	**.330****	**-.436*****	**-.358****	**.419*****
Concerns	.208	**.305****	**-.341****	**-.308****	.209

*p<.05, **p< .01, ***p< .001 Significant 2-Tailed (Bonferoni correction applied) PH: Physical health, MH: Mental Health

Relationships between Cognitive Representations and aspects of Disease-Specific Outcome

As presented in Table 7.6b below a high identity, beliefs of a chronic timeline and serious consequences were all strongly related to the self-reporting of more swelling, impact on life activities, sleep problems, limitations, concerns about looks (all p<.001) and pruritus (p<.01). Emotional representations were also significantly related to all outcomes and again more for concerns about looks over pruritus. Specific necessity beliefs also showed significant relationships to all outcomes but in contrast (and with exception of pruritus) specific concern beliefs also had a negative impact on all QoL outcomes. A greater understanding of CU was significantly related to less concern about looks and perceptions of better treatment control were significantly related to better aspects of QoL.

Table 7.6b: Relationships between Representations and Disease-Specific Quality of life

	Pruritus	**Swelling**	**Impact on Life activities**	**Sleep Problems**	**Limits**	**Looks**
Illness identity	.295**	.408***	.609***	.479***	.457***	.388***
Psych cause	.105	.043	.174	.199	.093	.136
Risk cause	.080	.062	.132	.141	.148	.078
Immunity cause	-.005	.093	-.006	-.008	.031	-.057
Ac/ chance cause	-.010	.117	.042	.002	. 066	.043
Timeline a/c	.495***	.339**	.506***	.394**	.475***	.556***
Timeline cyclical	.012	.053	.023	.122	.069	.234*
Consequences	.446***	.574***	.537***	.344**	.425***	.457***
Personal control	.020	.111	.084	-.063	-.027	-.085
Treatment control	-.236*	-.293**	-.286*	-.238*	-.251*	-.219
Illness coherence	-.069	-.155	-.085	-.022	-.068	-.257*
Emotional	.231*	.356**	-.350**	.275*	.364**	.409***
Necessity	.301**	.395***	.415***	.264*	.307**	.277*
Concerns	.060	.282*	.244*	.364*	.267*	.277*

*P < .05, **P < .01, ***P < .001 Significant 2-Tailed (Bonferoni correction applied)

Relationships between Representations and Outcome Controlling for Patients Characteristics

Partial correlations were undertaken to determine if the relationship between significantly correlated cognitive representations and outcomes were still significant when controlling for socio-

demographic and clinical variables known to be related to these outcomes significant relationships between cognitive representation and CU outcomes still held when controlling for patient characteristics with the exception of that between psychological cause and general mental health status ($r = -.23$, $p < .05$). Controlling for marital status, this relationship was not significant ($r = -.18$, $p > .05$).

7.3.8: Coping and CU Outcome

When linear relationships between coping and outcome were examined both positive cognitive appraisal and use of support resources coping were unrelated to all outcomes (see Table 7.7a). In contrast the exploration of non-linear relationships between negative cognitive appraisal coping and outcome (Table 7.7b) found very strong and significant relationships to all outcomes. Linear relationships between proactive coping and outcome were only significant to anxiety, general mental health status and disease-specific QoL. Even though these relationships were not as strong as for negative cognitive appraisal coping, they were important as findings reported earlier found that 71.6% of participants used proactive coping with over just 13.7% who used negative cognitive appraisal.

Table 7.7a: Linear Relationships between Coping Behaviour and Outcomes▲

	Anxiety	Depression	PCS	MCS	Overall QoL
Pro-Active Cope	.236*	.186	-.192	-.241*	.268*
Pos Cog. Appraisal	.181	-.107	-.018	-.077	.095
Use of Support	.010	-.162	.153	.069	.035

*P <.05 Significant 2-Tailed▲ Pearson's r

Table 7.7b: Non-Linear Relationships between Negative Cognitive Appraisal and Outcomes▲

	Anxiety	Depression	PCS	MCS	Overall QoL
Neg. Cog. Appraisal	.564***	.450***	-.288**	-.477***	-.447***

**P < .01, ***P < .001 Significant 2-Tailed ▲Spearman's rho

7.3.9: Self-Regulatory Predictors of Outcome

These analyses examined relevant self-regulatory factors as predictors of five different models of CU outcome. The coping predictor featured in each model was pro-active and not negative cognitive appraisal coping. The justification for this was that the data that represented pro-active coping was normally distributed and therefore appropriate for multiple regression whereas the original data that represented negative cognitive appraisal coping behaviour was not (up to this point the latter has been examined using non-parametric statistics). Proactive coping was also the coping strategy used by over two-thirds of the study sample as reported earlier, however non-linear relationships found between negative cognitive appraisal and outcome appeared too important to ignore and therefore the data for this variable was re-coded into a discrete dichotomous score (i.e. 1= used strategy a lot/ medium amount and 0= a small amount/ not at all) for exploratory purposes to examine its contribution. Only variables that correlated significantly to each outcome were entered block-wise into each regression model. As shown in Tables 7.8a-b (psychological distress) and 7.8c (QoL) on p196 and p197 respectively predictors explained 35.0 to 64.0% of the total variance in outcomes.

Patient Characteristic Predictors of Outcome

Only marital status contributed a significant 9% of the variance in generic mental health status (F (1, 74) = 7.09, $p < 0.05$) and together with age predicted a strong and significant 15% of disease-specific QoL (F (1, 74) = 3.77, $p < 0.01$).

Cognitive Representational Predictors of Outcome

Illness and treatment perceptions explained a strong and significant 35.4 to 60.6% of the variance in the outcome across the regression models. Emotional representations, which were entered in its own block across models explained a smaller but significant 4% and 9.6% of the variance in general mental health status and anxiety respectively.

Table 7.8a: Regression Models of Cognitions and Proactive Coping on Psychological Distress

Regression Model	**Anxiety**		**Depression**	
Predictor Block 1	***β***	***t*- value**	***β***	***t*- value**
Illness identity	0.26	2.24*	0.26	-0.25*
Psych cause	0.11	1.02	n/a	n/a
Chance cause	0.08	0.71	n/a	n/a
Timeline (chronic)	0.07	-0.61	0.01	0.07
Consequences	-0.03	-0.19	0.07	0.52
Treatment control	n/a	n/a	-0.23	-2.08*
Necessity	n/a	n/a	0.16	1.39
Concerns	n/a	n/a	0.17	1.52
Block Model	R^2 25.8%,	**Adj.** R^2 21%	R^2 36.3%,	**Adj.** R^2 30.6%
	F (5,71) = 4.95***		***F*** (6,68) = 6.45***	
Predictor Block 2				
Emotional representation	0.41	3.08**	0.15	1.14
Block Model	R^2 35.4%,	**Adj.** R^2 30.0%	R^2 37.5%,	**Adj.** R^2 30.9%
	F (1,70) = 10.35**		***F*** (1,67) = 1.29	
Predictor block 3				
Proactive coping	-0.00	-0.01	n/a	n/a
Block Model	R^2 35.4%,	**Adj.** R^2 28.8%	n/a	n/a
	F (1,69) = 0.00		n/a	n/a
Overall Final Model (*F*)	***F*** (1, 69) = 5.40***		**n/a**	**n/a**

***p*< .05, **p*< .01, ***p*< .001**

Table 7.8b: Regression Models of Cognitions and Negative Cognitive Appraisal Coping on Psychological Distress

Predictor block 3▲				
Negative cog. Appraisal	**0.22**	**1.91**	**0.18**	**1.54**
Model	R^2 38.6%,	**Adj.** R^2 29.9%	R^2 **37.5%,**	**Adj.** R^2 29.9%
	F (1,66) = 2.38		***F*** (1, 66) = 0.00	
Overall Final model (F)	***F*** (1, 66) = 6.21***		***F*** (1/66) = 4.94***	

***p*< .05, **p*< .01, ***p*< .001** ▲Blocks 1 and 2 was the same as proactive coping

Table 7.8c: Regression Models of Cognitions and Coping on Quality of Life

	Generic physical health		Generic mental health		CU-Specific QoL	
	B	***t*- value**	***β***	***t*- value**	***β***	***t* – value**
Age	n/a	n/a	n/a	n/a	-0.01	0.17
Marital status	n/a	n/a	0.17	1.75	-0.18	2.34*
CU Medicines	0.08	0.94	n/a	n/a	n/a	n/a
Block 1 Model	***R*²** 4.8%, **Adj. *R*²** 3.6%, ***F*** (1,74) = 3.77		***R*²** 8.70%, **Adj. *R*²** 7.5% ***F*** (1,74) = 7.09**		***R*²** 14.5%, **Adj. *R*²** 12.1% ***F*** (2,73) = 6.18**	
Illness identity	-0.38	-3.78**	-0.34	2.94**	0.26	2.80**
Psych cause	n/a	n/a	-0.04	-0.43	n/a	n/a
Chance cause	n/a	n/a	n/a	n/a	n/a	n/a
Timeline (chronic)	-0.02	-0.14	-0.00	-0.04	0.32	3.80***
Consequences	-0.20	-.2.06	0.02	0.11	0.21	2.0
Treatment control	n/a	-1.46	0.14	1.34	n/a	n/a
Specific necessity	-0.15	n/a	-0.14	-1.30	0.12	1.47
Specific concerns	-0.20	-2.03	-0.15	-0.46	n/a	n/a
Block 2 Model	***R*²** 50.1%, **Adj. *R*²** 45.8% ***F*** (5,69) = 12.52***		***R*² 43.4%,** **Adj.** *R*² 36.7% ***F*** (7.67) = 5.87***		***R*²** 62.1%, **Adj. *R*²** 58.8% ***F*** (4,69) = 21.64***	
Emotional represent	. -.02	-0.15*	-0.24	-1.97*	0.07	0.74
Block 3 Model	***R*²** 50.1%, **Adj. *R*²** 45.0% ***F*** (1,68) = 0.2		***R*²** 46.8%, **Adj. *R*²** 39.5% ***F*** (1,66) = 4.15*		***R*²** 62.8%, **Adj. *R*²** 59.0% ***F*** (1,68) = 1.43	
Proactive Coping as a final block entry▲						
Proactive coping	n/a	n/a	0.01	0.06	0.11	1.30
Block 4 Model	n/a **n/a**	n/a **n/a**	***R*² 46.8%,** **Adj. *R*²** 38.6% ***F*** (1,65) = 0.00		***R*² 63.8%,** **Adj. *R*²** 59.4% ***F*** (1,67) = 1.68	
Overall Final model	**n/a**	**n/a**	***F*** (1,65) = 5.71***		***F*** (1,67) = 14.73***	
Negative Cognitive Appraisal as a final block entry▲						
Neg Cog Appriasal	-0.05	-0.51	-0.11	-1.05	0.01	0.90
Block 4 Model	***R*²** 39.9%, **Adj.** *R*² 33.8% ***F*** (1,69) = 0.26		***R*²** 46.9%, **Adj. *R*²** 38.7% ***F*** (1,65) = 0.16		***R*²** 65.3%, **Adj. *R*²** 61.1% ***F*** (1,67) = 4.66	
Overall Final model	***F***(1,69) = 6.55***		***F*** (1,65) = 5.74***		***F*** (1,67) = 15.73***	

*p< .05, **p< .01, ***p< .001 ▲Coping variables were analysed separately in two different models

The best cognitive representational predictor of anxiety was illness identity (t (70)= 2.38, p< .05). Together with treatment control (t (68)= -2.04, p< .05) illness identity (t (68)= 2.15, p< .05) was also a significant predictor of depression. Again Illness identity (t (69)= -3.85, p< .001) with consequences (t (69)= -2.37, p< .05) and specific concerns (t (69)= 2.16, p< .05) significantly predicted general physical health status. Further illness identity (t (66)= -3.09, p< .01) together with emotional representations (t (66)= -2.04, p<.05) predicted general mental health status. Finally, illness identity (t (69)= 3.22, p< .01) and chronic timeline (t (69)= -3.8, p< .001) strongly predicted disease-specific QoL.

Coping as Predictors of Outcome

Weak relationships between proactive coping and outcome were reflected in their inability to significantly predict outcome in any regression model (all p >.05). Negative cognitive appraisal, which bared strong relationships to outcome, also failed to predict outcome across models (all p >.05).

7.3.10: Coping as a Mediator between Representations and Outcome

Finally path analyses were undertaken to examine whether the relationship between representation and outcome is mediated by coping behaviour. Earlier analysis had already established that negative cognitive appraisal was an insignificant predictor of all outcomes, as were proactive coping on depression, general physical health status and disease-specific QoL and therefore violated the third criteria for testing mediation (i.e. the mediator must significantly predict the outcome). No mediation tests were undertaken of these models. Only the cognitive representational components of identity, psychological attributions and emotional representations correlated to both proactive coping and anxiety, general mental health status and disease-specific QoL outcomes and therefore were subjected to further regression and mediation tests. The results of the mediation tests for each model including a summary of representational predictors of coping behaviour, path estimates of mediation effects and goodness-of-fit indices are presented in Table 7.9 (p199).

Table 7.9: Summary of Pro-Active Coping Multiple Regression Models, Mediation and Goodness of Fit Tests

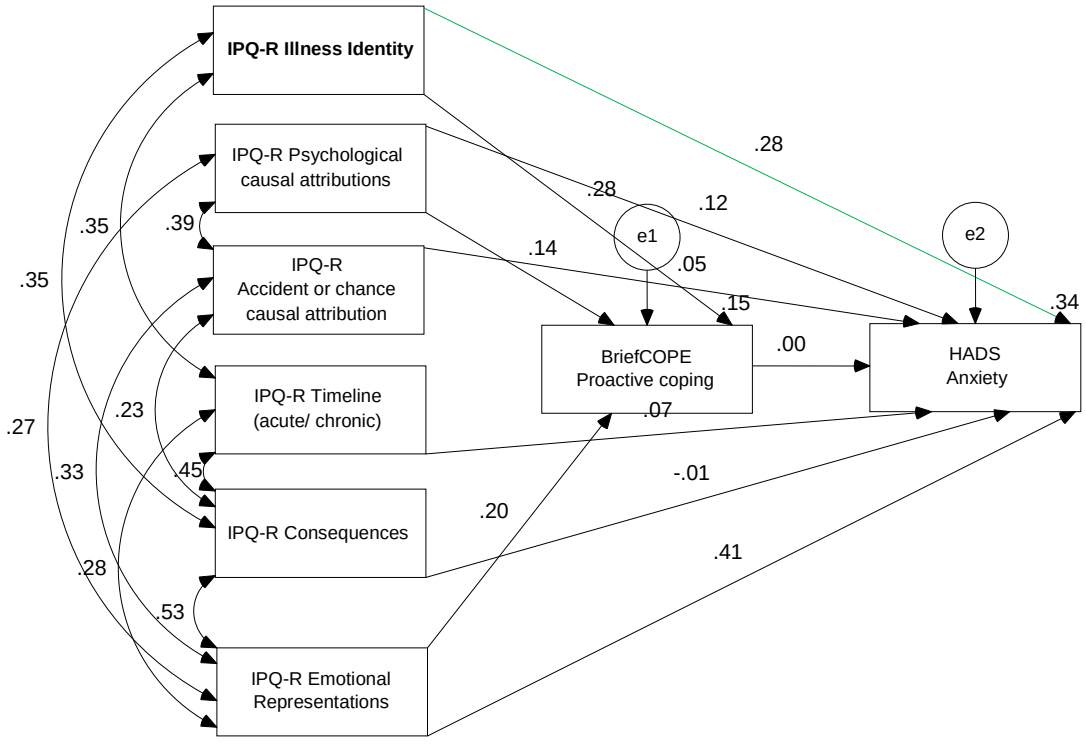
Model	Overall Coping Model	Possible predictor of pro-active coping	*β*	*t*	Mediation Tests				Goodness of Fit Tests			
					Direct	Indirect	Total	Sobel Test	GFI	CFI	NFI	RMSEA
Anxiety	R^2 17.4%	Illness identity	.27	2.53*	.28	.00	1.28	-.0.01, *p*=.99	x^2 = 8.07, *df* = 9, *p* = .53	.1	.95	*p* < .001 (CI .00-.12)
	Adj. R^2 14.1%	Psychological cause	.14	1.53	.12	.00	.12	-.0.01, *p*=.99				
	F (76) = 5.33**	Emotional representation	.21	1.92	.41	.00	.41	-.0.01, *p*=.99				
Generic Mental Health	R^2 17.4%	Illness identity	.27	2.53*	-.39	.00	-.39	-.0.05, *p*=.96	x^2 = 32.64, *df* = 26, *p*= .17	.95	.85	*p* = .06 (CI .00- .11)
	Adj. R^2 14.1%	Psychological cause	.14	1.53	-.06	.00	-.06	-.0.05, *p*=.96				
	F(69) = 5.33**	Emotional representation	.21	1.92	-.22	.00	-.22	-.0.05, *p*=.96				
Disease-specific QoL	R^2 15%	Illness identity	.292	.74**	.28	.03	.031	0.16, *p*= .26	x^2= 13.77, *df*= 15, *p*= .54	1	.93	*p* < .001 (CI .00- .1)
	Adj. R^2 13%	Emotional represent	.232	.17*	.09	.002	.090	1.04, *p*= .30				
	F (78) 7.04**											

*p<.05, **p< .01,***p< .001 **Key:** GFI: Goodness of fit index, NFI: Normative Fit Index, RMSEA/ CI: Root Mean Square Error of Approximation (and its confidence interval)

Path Analysis Model of Anxiety

The co-variances between cognitive representations in the anxiety model and paths from representations to coping and coping to outcome are illustrated in Figure 7.1 below. An initial observation of the path diagram confirmed that the co-variances between the predictor variables and the path coefficients between predictors and outcomes were a close match to their corresponding correlation matrix and multiple regression B coefficients with little error, however mediation tests shown in Table 7.9 (p199 above) and the coping to outcome path in Figure 7.1 suggested that coping was not a significant mediator. Only illness identity presented as a significant predictor of proactive coping ($p < .05$). The path coefficients of both emotional

Figure 7.1: Path Analysis Model Predicting Anxiety



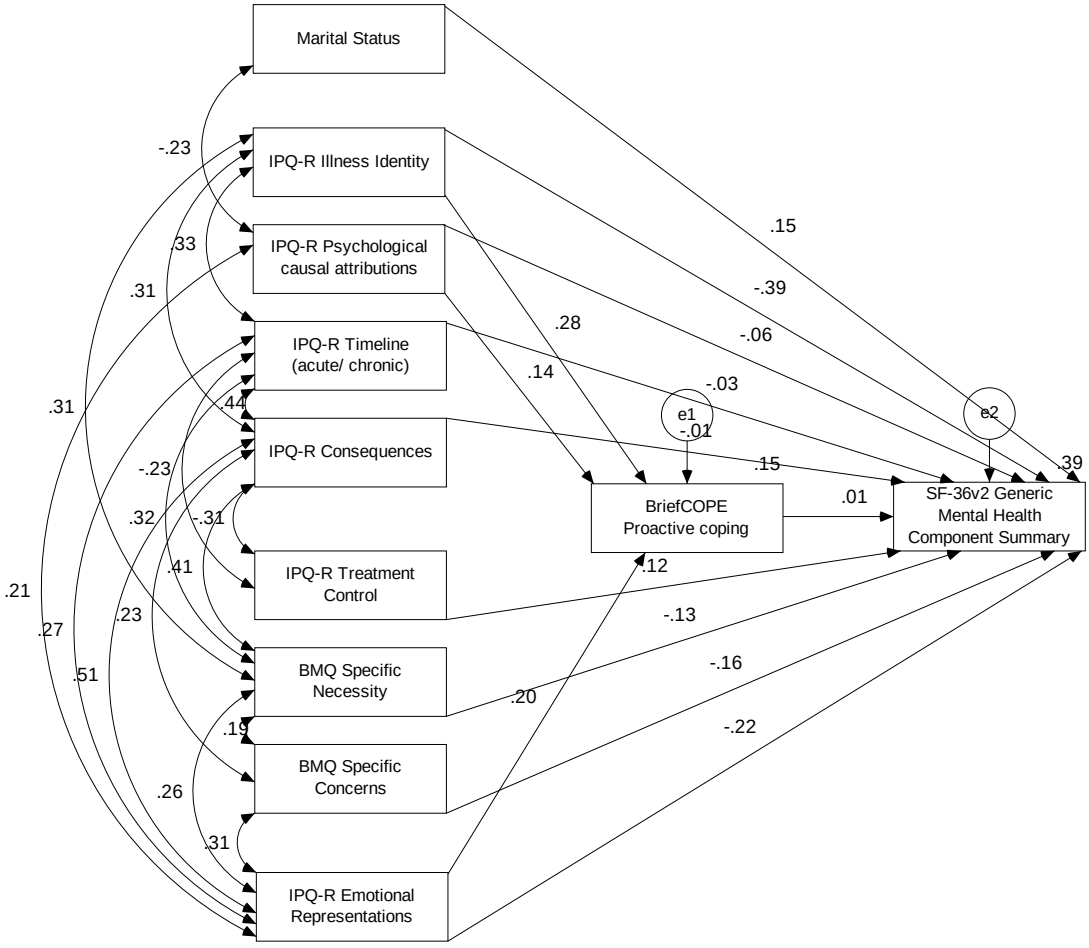
representations and psychological cause predictors on proactive coping were insignificant violating the second criterion for testing a mediation model. The indirect effect from emotional representation to anxiety via proactive coping was estimated as zero indicating that no mediation had occurred. These findings mirrored those of illness identity and psychological attributions that also failed to show mediation in the anxiety model, so even though proactive coping was related

to anxiety it did not appear to significantly predict it. The Sobel test confirmed a lack of mediation for identity and emotional representations on anxiety (p >.05). The remaining direct relationships in the path were not significant predictors of anxiety. A goodness of fit test (GFI) of the model produced a non-significant chi-square indicating the model as a good comparative fit. Other good fit indices applied the CFI indicated a perfect fit, the NFI was a good fit as was the RMSEA and its 90% confidence intervals and estimation of close-fit. Dropping the insignificant paths reduced the model fit and so they remained.

Path Analysis Model of General Mental Health Status

The co-variances between cognitive representations in the general health status model and paths from representations to coping and coping to outcome are illustrated in Figure 7.2

Figure 7.2: Path Analysis Model Predicting General Mental Health Status



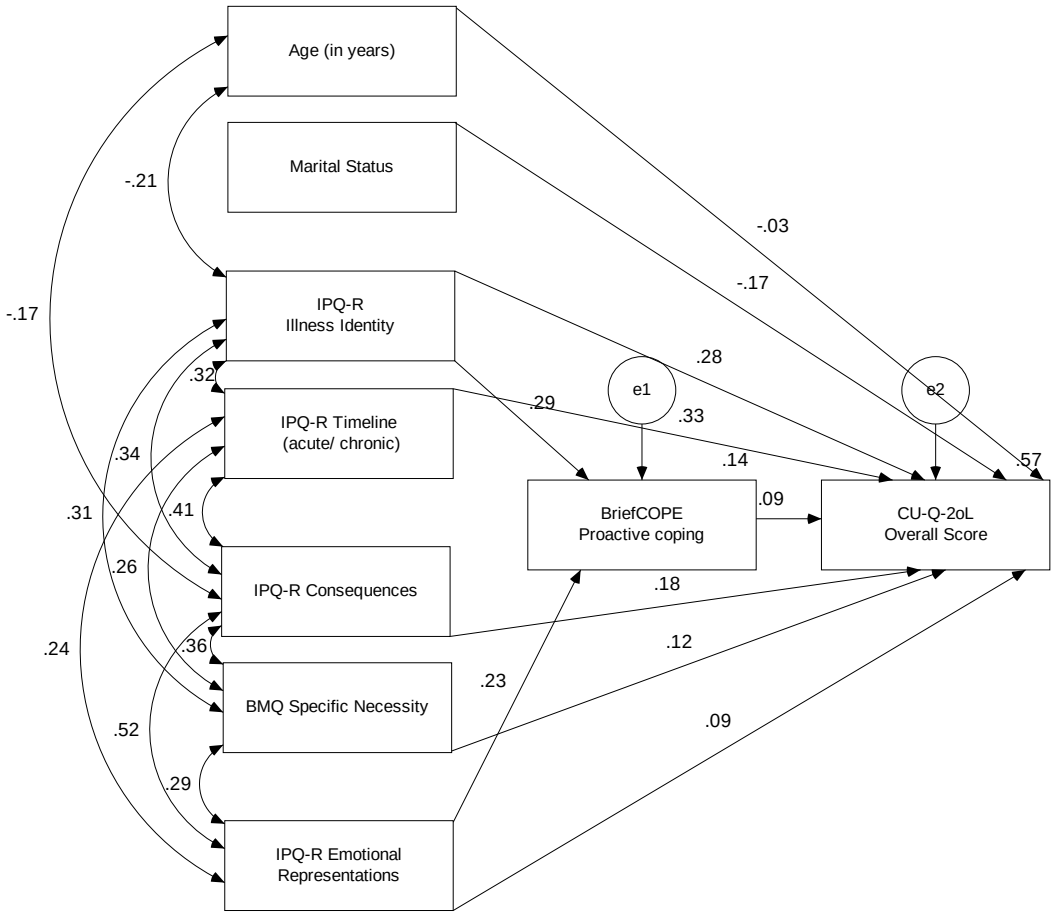
An observation of the path diagram confirmed that the co-variances between the predictor variables and the path coefficients between predictors and outcomes were again a close match to their corresponding correlation matrix and multiple regression *B* coefficients however, as for the anxiety model mediation tests shown in Table 7.9 (p199) and the coping to outcome path in Figure 7.2 suggested that no mediation had occurred between representations and outcome. Only Illness identity presented as a significant predictor of proactive coping ($p < .05$). In line with the anxiety model the maximum likelihood path coefficients from emotional representation to anxiety via proactive coping were estimated as zero and the total effect replicated the direct effect indicating that proactive coping was not a significant mediator between emotional represents and outcome. These findings mirrored illness identity and psychological attributions that also failed to show mediation here. The Sobel test confirmed the lack of mediation (all $p > .05$). The remaining direct relationships were not significant predictors.

The goodness of fit test (or GFI) of the model indicated a good and comparative model fit. The CFI also indicated a good fit. The NFI fell slightly short of a good fit as was the RMSEA and its 90% confidence intervals and estimation of close-fit. Dropping the insignificant paths reduced the model fit and so remained in the model. Dropping the insignificant paths reduced the model fit further producing a significant chi-square so remained in the model.

Path Analysis Model of Overall Disease-Specific Quality of Life

The co-variances between cognitive representations in the overall disease-specific QoL model and paths from representations to coping and coping to outcome are illustrated in Figure 7.3 (p203). The path estimates suggested that no mediation had occurred. Again Illness identity presented as the only significant predictor of proactive coping ($p< .05$) In line with other models the maximum likelihood path coefficients from emotional representation to anxiety via proactive coping were estimated as zero and the total effect replicated the direct effect

Figure 7.3: Path Analysis Model Predicting Disease-Specific Quality of Life



indicating that proactive coping was not a significant mediator between emotional represents and outcome. Illness identity also failed to show mediation in this model and this was again confirmed by the Sobel test (all p >.05). The remaining direct relationships in the path were not significant predictors of outcome. The remaining direct relationships in the path were significant for marital status (p< .05) and timeline (acute/ chronic; p <.001) but consequences fell marginal of a significant direct relationship (p= .052). Age and specific necessity were not significant predictors of outcome. The CFI was 1 indicating a perfect fit and the NFI indicated a good model fit. The RMSEA and its 90% confidence intervals also indicated a good fit and an excellent close-fit well above the .50 recommendations. Dropping the insignificant paths reduced the model fit further producing a significant chi-square so remained in the model.

7.4: Discussion

The aim of this study was to explore a role for cognitive representations of CU as determinants of CU-related quality of life outcomes within the CSM. This study first confirmed the hypothesis that CU has a moderate impact on quality of life (QoL) and is associated with significant psychological distress. The study's main hypotheses were largely supported in that the data provided strong preliminary evidence to suggest that individuals with CU hold cognitive representations of their illness and they hold them in similar predictable relationships to other chronic illnesses. Further strong direct relationships were found between representations and outcome in directions predicted. Representations were the strongest predictors of CU-related outcomes explaining 35.4 - 60.6% variance across models but coping as a mediator was not supported. These findings and their implications are discussed below in the context of the studies methodological limitations.

CU Outcome

The first finding supported the hypothesis that CU had a moderate impact on QoL. This moderate impact is in line with the findings of the systematic reviews reported in studies 1 and 2. The aim of study 1 was to systematically review the impact of CU on quality of life and the results were initially equivocal as they indicated that CU had a mild or moderate impact depending on which QoL instrument had been used within studies. More specifically a mild impact was reported if the DLQI (Dermatology Life Quality Index) had been used and a moderate impact for other QoL instruments (e.g. SF-36, Skindex-29; CUQ_2-oL). The systematic review of QoL instruments (study 2) aimed to resolve this by determining which questionnaires were the most valid and reliable for CU research. Strong evidence from this review together with psychometric investigations from other studies (Twiss et al. 2012; Basra et al. 2008; Both et al. 2007; Lenox and Leahy, 2004; De Korte el al. 2002; Nijsten, 2012) supported the supposition that the DLQI was not a valid measure of CU-related QoL. It was concluded in study 2 that the

SF-36 and CU-Q_2-oL be used as measures of CU-related QoL. Their use in this study provided further evidence to support that the moderate impact found in this CU study sample is representative of the wider CU literature.

A pertinent related finding in this study was that CU impacts all aspects of QoL and not just physical functioning. More specifically 35.8% of the sample reported poorer generic physical health (60.28 ± 23.83) as to 38.8% who reported worst generic mental health (57.04 ± 21.63) and further 48.1% as to 48.7% reported worse impact regarding disease-specific pruritus (itch) as to disease-specific Looks respectively. Such reports mirror the findings of the systematic review in study 1 that the impact on psychological aspects is often similarly (or more impaired) than the physical aspects (see section 3.3.4, p74), hence the CU sample in this study reflected the wider CU research literature. These findings supported that the psychosocial aspects of CU need to be addressed by health professionals working with these patients. The implications and practicalities of addressing psychosocial aspects of CU were discussed in great detail in Study 1 (section 3.5) but in summary this concerned the absence of CU-based interventions in routine care (Maurer et al. 2011), whether dermatologists have the skill set and consultation time to help patients cope with the psychosocial aspects of CU and whether psychologists need to be integrated into existing dermatological services or part of a structured psychology referral system. In the wider context of psycho-dermatological research these findings support the case for equally addressing appearance issues in visible skin disorders (Thompson, 2005) including individuals with CU where the fluctuating nature of CU symptoms had previously lead health professionals to believe its appearance had little impact on those experiencing it.

The secondary study outcome was psychological distress with mean scores of 9.45 ± 4.52 for anxiety and 6.55 ± 4.54 for depression. With higher scores indicating worse outcome and scores of 8-11 for possible co-morbidity the sample was more anxious than depressed and this was reflected in the combined possible-probable prevalence rates of 65.2% and 35.0% for

anxiety and depression respectively. These findings are in line with the studies summarised in Chapter 1 in that individuals with CU appear to be relatively more anxious than depressed (12 - 76.1% and 17- 43% respectively; see Table 2.1, p38), therefore they are consistent and representative of the research literature.

Individuals with CU hold Cognitive Representations of CU

In order to establish if representations of CU were significant correlates and predictors of CU-outcomes, it was first important to establish if individuals with CU held cognitive representations of their illness and if they held them in similar predictable relationships to other chronic illnesses. These hypotheses were initially supported in Study 3 in that the principal component analyses of the Revised Illness Perception Questionnaire (IPQ-R) and Beliefs about Medicines Questionnaire (BMQ) using CU data confirmed that these individuals cognitively configured perceptions of their illness in terms of identity, cause, timeline, cure/ control, emotions, necessity and concerns. In regards to the wider cognitive representational research literature this provided further support for the existence of these representations in another illness population (i.e. CU) but more specifically the data allowed for a closer examination of precisely how well individuals with CU actually understand their illness, how they assimilate and accommodate the symptom perceptions and social messages that are said to form them and how this can be changed.

The data indicated that to experience CU was to associate the condition to a high numbers of symptoms (*illness identity*) perceived to be attributed to psychological stress and/ or altered immunity (*cause*). Further, to live with CU meant living with a chronic condition that would be around for a very long time, even maybe the rest of one's life (*chronic timeline)* and it would come and go in unpredictable cycles (*timeline cyclical*). With such a timeline future prospects appear poor and it could be perceived in advance that CU would have serious consequences on one's on-going bio-psychosocial functioning of which any hope to controlling it personally or with

treatment (*control*) is met with scepticism. Such representations are further compounded by a parallel high emotional response within the self (*emotional responses)*. Even though this will vary to some degree across illnesses, it is known from Hagger and Orbell's (2003) meta-analytical review of the CSM that it is typical for chronically ill individuals to represent their lived illness experience in such a way, particularly the negative relationship between control perceptions and other illness perceptions, but what is more pertinent is if these are actually true representations of CU.

Identity, psychological attributions and emotional representations are predictors of CU outcome

The majority of the sample did associate itching and swelling to their CU illness identity in line with a medical understanding of the condition (Zuberbier et al. 2009a) but they also reported atypical symptoms at least 20% of the time including upset stomach, headache and sore throat which are not recognised CU symptoms. According to the CSM it is not unusual for individuals to assimilate and accommodate both typical and atypical symptoms they have experienced since their illness symptoms began and it appears that as part of the CSM's *symmetry rule* (i.e. linking symptoms to labels and labels to symptoms) this is what happens in many cases. Another explanation is that the sample was demonstrating somatisation but this was found to be insignificant. What is of great significance is that it was a high illness identity that was found to be the most influential component of CU representations strongly and significantly relating to poorer disease-specific aspects of QoL (itching, swelling, sleep problems, impact on life activities, limitations, looks) and directly predicting more anxiety, poorer general mental health status and overall disease-specific QoL. If illness identity is so core to CU-related outcomes these findings suggest that practitioners may have an opportunity during short consultations to considerably help improve the QoL of their patients by facilitating talk regarding cognitive representations of CU symptomatology and dispelling fact from fiction (i.e. checking knowledge and correcting misconceptions).

In line with other chronic illnesses two-thirds of the sample believed that psychological stress caused their illness (Hagger and Orbell, 2003). Psychological stress is not currently formally recognised as being a determinant (Maurer et al. 2011) but a growing evidence base is relating CU to stressful life events (e.g. Malhotra and Mehta, 2008; Dyke et al. 2008; Chung, et al. 2010a; Gupta and Gupta, 2012; Hunkin and Chung, 2012). The ability of stress to trigger or worsen pruritus in skin disorder has been well documented (e.g. Milard, 2005; Gupta and Gupta; 2004; Picardi and Abeni, 2001) and CU itself has been recognised as a psychogenic condition since the 1950's (Rees, 1957; Shipman, et al. 1959) but exactly how stress relates to CU process is not completely understood and more research is needed (Gupta and Gupta, 2012; Hunkin and Chung, 2012; see section 1.2.3 for a review). It seems that this belief in individuals with CU has some credence but with psychological attributions relating to higher emotional representations, broadening the patient's causal model to other factors may be critical for reducing high emotional responses. High emotional representations itself significantly predicted higher anxiety and poorer mental health suggesting that regardless of the nature and directions of the relationships between psychological factors and CU they have implications for incorporating interventions that help these individuals to self-regulate stress.

Although many of the remaining perceptions were not significant predictors of outcome it could be hypothesised by the dynamic nature of the CSM that cognitive representations co-vary in such a complex way that insignificant predictors of outcome may indirectly influence significant ones. It is this co-varying nature that allows for other misconceptions of CU in regard to timeline, control, coherence and medicine beliefs to be challenged by health professionals. CU is chronic in timeline but up to 50% of cases go into remission within 2-3 years and no cases of CU over a lifetime have ever been reported (Maurer et al. 2010) so holding these perceptions (50% of sample) may have detrimental effects on patients' future planning. The duration of CU cannot be predicted but there are factors such as disease-severity and experiencing concurrent

physical urticaria that can prolong duration (Maurer et al. 2010). Timeline was also related to reporting more serious consequences, poorer disease control and high emotional representations, so changing timeline perceptions may allow individuals to have a more positive outlook about controlling CU and planning the future.

It is known that getting the right combinations of CU medicines can be complicated (Zuberbier et al. 2009b) as it is highly individualised for each patient. First-line anti-histamine medicines may be increased up to fourfold and other treatments may be added including steroids and immunity-depressants, which may have harmful side effects (Zuberbier et al. 2009b). It is not surprising then that 88.0% of the sample believed in the necessity of CU medicines but were equally concerned about side effects (87.3%). In fact specific concern beliefs also had a negative impact on all CU-related QoL outcomes. Little is known about how much individuals with CU perceive and understand the process of testing different medicine combinations, the raising of doses above licensed recommendations and how much this process is explained to them but one explanation is that the urgency by doctors to find the right combinations may increase the patients' specific necessity beliefs but in the knowledge that the solution may have side effects that they should equally be concerned about. However it is indicated that up to two-thirds of those with CU wait for symptoms to appear before taking prescribed medicines (Maurer et al. 2009b) and this raises questions regarding whether they do not take CU medicines as prescribed because they are worried about side effects and then only take them when symptoms begin to reduce a toxic load. Also it raises the question concerning whether these patients believe that an absence of symptoms means an absence of active CU at particular periods of time. Discussing patient's perceptions of the treatment experience during consultations may help to balance beliefs in regard to whether the costs out-weigh the benefits, so they are taken in the absence of symptoms. However maybe these patients don't understand the CU patho-physiological process and how CU medicines work. In support of this explanation those who reported stronger illness

coherence significantly reported less emotional representations and less concerns about taking CU medicines.

With nearly 50% of the study sample reporting that they did not understand CU (consistent with a recent survey of over 300 CU patients; Maurer et al. 2009a) and a third wondering if their actions would make their CU better or worse, it appears that urticaria services need to adopt some form of psycho-educational strategy beyond the standard short consultation. In support of this, perceptions of better treatment control significantly related to better aspects of QoL. Previous studies have found that cognitive representations are amenable to change and improve outcome (e.g. Fortune et al. 2004; Petrie et al. 2002; Karamanidou et al. 2008; see section 2.5.3, p50).

Other factors: Age and Marital Status

Even though patient characteristics were not significant predictors of outcome, marital status and age did feature significantly in the regression models of CU outcome. Marital status (i.e. being married/ co-habiting) predicted a significant 9% of the variance in generic mental health status suggesting that the presence of a partner may further enhance interventions and be a source of support. This finding helped to strengthen the validity of earlier correlations that married/ cohabiting patients reported significantly less psychological attributions, better generic mental health status and better QoL. The wider research literature has recognised the important role of significant others in CSM interventions in terms of support and how the partners' representations of their partners' illness may impact outcomes (Sterba, DeVellis, Lewis, DeVellis, Jordan, Baucom, 2008; Broadbent, et. al. 2009; 2009b; Keogh, White, Smith, McGilloway, O'Dows, Gibney, 2007). Further being married/ co-habiting with older age strongly predicted better overall disease-specific QoL. A possible explanation for this is that the support of a partner together with the experience of living with CU together may play a role. This is merely speculative

but it is known that skin disorders in general do impact on relationships including coping and adjustment, appearance and shame, body image and sexual intimacy (Anthis, 2005). Younger age and earlier age of onset was also related to a strong illness identity (i.e. reporting more symptoms of ones symptoms to ones CU) and perceiving CU to have serious consequences on outcome. Whether this is just correlational is unknown but there is a growing literature on the impact of skin disorder throughout the life span (Warren, Kleyn and Gulliver, 2011; Thompson, 2005) and how this plays a role in CU may be important in identifying factors that result in better adjustment.

Coping

In the current study there was an opportunity to study coping. The research literature on coping in CU is scarce, but comparisons could be made one of the more comprehensive studies undertaken by Chung et al. (2010b). Using the Brief COPE, acceptance was reported as the most used coping strategy, a variable that has no equivalent item in the Ways of Coping Checklist used by Chung et al. (2010b). However this study relatively confirmed Chung's et al. (2010b) reports for conceptually equivalent strategies widely used in the current study which were active coping, planning, seeking instrumental social support and self-distraction (see Table 7.10; p212). The only discrepancy was that reports of substance use were considerably lower in this study compared to Chung et al. (2010b). These findings provide evidence that despite the negative impact of CU on quality of life, individuals with CU engage in more positive and strategic coping behaviours in an attempt to improve outcome. This was further confirmed by the descriptive analysis of the fourfactor second-order principal components analysis undertaken of the Brief COPE were positive coping (proactive coping,

Table 7.10: Coping in CU: Study 4 and Chung et al. (2010b)

This study	%	Chung et al. (2010b)	%
Active	72.2	Concentrating on procedures for self-management	68.0
Planning	68.7	Coming up with solution	66.0
Seeking instrumental social support	52.5	Seeking social support	75.0
Self-distraction	49.4	Tried not think about it	73.0
Humour	42.5	Not to take it too seriously	71.0
Venting	27.5	Keeping feelings to/ Not letting others know oneself	64.00/ 62.0
	06.0	Turned to eating, drinking and/ or smoking	53.0

71.6% and positive cognitive appraisal, 41.5%) prevailed over negative coping (negative cognitive appraisal, 13.7%). It does also suggest that if provided with more fruitful coping strategies through action plans (an integral part of CSM interventions) these individuals may already possess a motivational drive towards self-regulating their illness. What needs to be considered in respect to these findings is that the CSM postulates that coping procedures do not function in isolation but are influenced by cognitive representations (i.e. the IF-THEN rule). The IF-THEN rule was supported in respect to illness identity and emotional representations that together indicated that individuals with CU use parallel cognitive representations of danger and fear which act as driving motivators for adopting coping procedures.

Discrepancies

Despite there being much evidence to support a common-sense model of CU-related QoL outcomes, discrepancies did occur in this study. First the model predicts that the path from representation to outcome is mediated by coping but this did not occur. For example representations did predict coping behaviours but these representations also directly predicted outcome independent of a coping mediator. In terms of the CSM research literature this is not an unusual occurrence. It was highlighted in chapter 2 that some studies have failed to find mediation. The most obvious explanation is a disease-specific one in that this does not occur in CU but another is a psychometric one. It has been suggested that studies often use generic

questionnaires (Hagger and Orbell, 2003), but studies using such measures have found mediation (e.g. Rutter and Rutter, 2002). Rutter and Rutter (2002) used the COPE inventory but did not factor analyse the individual coping strategies to reduce the number of factors. It could be that the reduced Brief COPE factors in this study reduced its sensitivity to find mediating relationships. This explanation could be tested in future studies.

Second, those who reported a strong illness identity and high emotional representations not only reported significantly greater use of negative cognitive appraisal coping procedures (as would be predicted) but also proactive coping. An explanation might be found in the nature of the coping procedures in that the former is a thinking process and the later a doing process. It could be that despite the negative thinking about the impact of CU on one's lived experience, one has to continue to strive for positive and proactive ways of getting out of one's predicament. Positive and negative coping procedures also related to poorer outcomes, a finding mirrored in the dermatological condition alopecia (Cartwright et al. 2009). It was suggested here that the Brief COPE may lack discriminatory power but CU is complex with an unclear course and a more likely explanation may lie in research suggesting that enforcing problem solving strategies in the face of what seems to be an uncontrollable situation may result in poor adjustment similar to negative forms of coping (Carver and Conner-Smith, 2010).

Finally perceptions of serious consequences were the strongest correlate of all outcomes but did not predict them. One explanation may lie in CU itself. It was theorised in Section 3.4.1 that CU's daily fluctuating and cyclical nature in symptom presentation, often with concurrent multiple physical urticarias might impact study findings. It might be that such factors allow CU to be perceived to have serious consequences (hence the high correlations) but the contents of this perception fluctuates so much depending on CU's presentation at any moment in time that its effect on outcome are difficult to predict. CU is very complex and a more qualitative approach may help answer these questions.

Methodological Limitations

In light of the findings of this study, the limitations of the study do require consideration. Firstly the cross-sectional design of the study meant that causality could not be established. Future longitudinal studies may provide further insight into how representations of CU and coping behaviours change over time and in effect impact QoL and psychological distress. Such studies may explain the lack of predictive contribution of the serious consequences illness perception that strongly correlated to outcome. It would also eliminate the retrospective reporting nature of cross-section studies in which participants are required to recall a lot of information particularly a daily fluctuating condition such as CU. Despite this limitation however the study did find logical patterns amongst the research sample, many of which were CSM confirming and other possibly more CU specific. Second it would not be unreasonable to hypothesize that poorer quality of life and psychological distress may influence coping behaviours that in turn change the cognitive representation. For example feeling good and asymptomatic one day may result in not participating in the coping action (e.g. planning) that helped that good feeling and engage in another (e.g. denial) leading to a change in thought process (I am no longer in danger and don't need to get emotional). In defence of this study the CSM does propose that outcomes can impact representations and further one can find oneself moving between cognitions and coping and coping and outcome as the CSM acts as a dynamic model of attempts to self-regulate illness. This makes sense as the model has its foundations grounded in cybernetic control theory (a bio-feedback system of self-regulatory control; see section 2.1.1, p19). In a real world context practitioners would assess patients to determine where in the cycle to intervene (from the top-down or bottom-up).

In regard to the study participants, females' substantially outnumbered male's 9:1. Even though this discrepancy is not dissimilar to previous dermatology based illness perception studies (see section 2.4.1, p42), it is difficult to establish why this is the case. One explanation is

that CU is a visible condition and may impact on issues regarding physical appearance that mainly effect women (Hassan, Grogan, Clark-Carter and Richards, 2009). Another explanation may lie in research supporting that men seek health services less than women (Hunt, Adamson and Galdas, 2012) so are less likely to be recruited. In defence of this study women do greatly outnumber men in CU research in ratios found in this study sample and the age distribution was also in line with other CU research (see section 3.3.1, p60).

In respect to measures, although the HADS is a valid measure of anxiety and depression, it is still a screening measure. A diagnostic assessment would have allowed for a more reliable measure especially in regard to being able to separate clinical disorder as a personality variable or as a result of distress. To minimise this possible occurrence the psychiatric status of patients were established at the recruitment stage of the study. Second, disease-severity was not measured and this missed an opportunity to establish if cognitive representations and coping behaviour are the better significant predictors of outcome. It is recommended that this be addressed in future studies. Further medication adherence was not measured. In hindsight it could have been included as another secondary measure as a way of exploring cognitions as predictors of what is known about oral medication usage in CU, which can be evidently non-adherent (Maurer et al. 2009b).

7.5: Conclusion and Recommendations

To conclude, with cognitive representations predicting a considerable 35.4 to 60.6% of the variance in primary QoL and secondary psychological distress, developing and integrating evidence-based psycho-educational initiatives and routine care approaches that focus on changing the patients implicit model of CU may prove cost effective by encouraging patient behaviour change that leads to better CU self-regulation and self-management and therefore less visits to dermatological services.

Chapter 8

Making Sense of Common Sense: An interpretive Phenomenological Analysis of Cognitive Representations, Coping and Outcome in Chronic Urticaria (Study 5)

8.1: Introduction and Rationale

Much post-study 'talk' from participants, which expanded on their CU representations beyond the detail possible from quantitative methods used in Study 4, went undocumented as it lacked the richer accounts that qualitative methodology allows. The lack of qualitative data on lived experiences in CU (see Broom, 2010 and Soloman and Gould, 2011 for examples) further instigated this study that interviewed the CU perceptions of 4 women using interpretive phenomenological analysis. The premises of studying cognitive representations are to explore how individuals make sense off and respond to illness (see chapter 2). This study used CSM components as the basis for developing the semi-structured interview schedule that would allow for this richer understanding. Questions on outcome were not created as it was hoped that these would naturally emerge from verbalisations on perceptions

8.2: Method

8.2:1: Design

This qualitative study used the methods of IPA (Smith 1996; Smith, Flowers and Larkin, 2009). In IPA it is assumed that although ones cognitions cannot be directly accessed through verbal accounts, they can be revealed through the IPA analytical process through the participants talk (i.e. transcripts). IPA assumes that there is an interaction between people's cognitions and emotions where they are trying to make sense of their personal and social world that they often find difficult to express and it is the researchers and participants place to make sense of it all. Although this study was not to validate the CSM, IPA shares the communality of recognising this interaction of cognitive-emotional processes and sense-making that is involved. IPA concerns itself with symbolic interactionism (how individuals cognitively construct meaning and make sense of objects or events within their personal and social world,

and a double hermeneutic (or two stage interpretive process) of the researcher making sense of the participant making sense of their world but also using questioning hermeneutics (e.g. what is the individual trying to achieve or is unaware of).

8.2.2: Participants and Context:

Four participants were recruited from the weekly urticaria clinic at St John's Institute of Dermatology, London (an account of the clinic can be found on page 134. IPA's originator Jonathan Smith recommends a sample size of 4-10 for doctorates and emphasised that larger numbers do not equal better IPAs. Participants were informed about this study by the researcher and provided with pre-study recruitment documents before embarking on an interview date (see p134). In line with a purposeful homogenous sample recommended for IPA individuals could participate if they were female with a primary diagnosis of CU and between 27-57 years old. This demographic was in line with the CU research literature reported in the systematic review in Chapter 3 (see p60). Those without a good command of English were excluded. The sample consisted of four females whose characteristics are described in Table 8.1 below.

Table 8.1: Participant Characteristics

Name*	**Diagnosis**	**Age**	**Ethnicity**	**Occupation**	**Marital Status**	**Disease duration** (years)
Karen	Autoimmune	50	White British	Housewife	Married	21
Hanna	Idiopathic	45	White British	Dog Walker	Co-habiting	32
Paula	Idiopathic	47	White British	Teacher	Married	32
Jess	Autoimmune	52	White British	Writer	Married	48

*Assigned name to protect real identity

8.2.3: Data Collection and Procedure

A semi-structured interview schedule including questions on CU perceptions and (see p139; Appendix 4, pA37) was created using guidelines from Smith and Osborn (2003). Participants decided whether to undertake the interview at their home or at the clinic in a private room. Interviews were recorded and lasted approximately 20 minutes. At the end of the interviews participants were debriefed and

interviews were transcribed verbatim with personal identifiers removed.

8.2.4: Data Analysis

The first interview was played back and read a couple of times to allow familiarity with the text. The text was then explored to identify novel disease-specific themes. This was done through a free textual analysis of the data to observe and note down any associations, comments and use of language and these were noted in the left hand margin of the transcribed interview text.

Emergent Themes

The text was read (and re-read) to identify novel emerging themes and these were annotated in the second margin with theme titles and quotations from the text extracted to qualify each emerging theme. Themes were first listed in the chronological order of the text but were then clustered if they appeared to form a part of the same concept. These clusters were then further grouped into sub-ordinate themes with a name that represented the clusters. Super-ordinate themes were identified by putting like themes with like (abstraction), noticing emergent themes that drew a group of similar themes together (subsumption), finding oppositional relationships (polarization), identifying narrative elements (contextualisation) and the frequency of themes in the text and their functioning. Themes identified in the first case were searched for in the four proceeding transcripts and new themes were searched for and adjustments made to accommodate these and any similarities and/ or differences. Themes and super-ordinate themes were merged together for the group into higher order themes.

8.2.5: Validity and Quality

Approaches to assessing the validity and reliability of quantitative research include those by Elliot, Fischer and Rennie (1999) and Yardley (2000). The originators of IPA Jonathan Smith (Smith et al, 2009) used guidelines by Yardley (2000) and for this reasons these criteria were used. How each was met is described below:

Sensitivity to Context

This criterion first demonstrates an awareness of the existing literature and theory either for the topic under investigation (e.g. CU, QoL, cognitive representations) or the underpinning of research itself (i.e. IPA) and the data collected from participants. These was supported by the introductory reviews in Chapters 1-2, by Sections 8.1 and 8.2 in this chapter and in the way study data was collected (all section 8.2) by evidencing the researchers interpretations from material drawn from participants with verbatim extracts from the data respectively. This criterion can also be shown by being sensitive to the studies socio-cultural setting (see section 5.3.1, p134) and issues of power between the researcher and participant. For the latter (as reported earlier) participants had the opportunity to be interviewed at the clinic or in their home. Further the researcher kept interviews informal, wore causal but smart clothing, avoided sitting behind a desk and sat on a seat of a similar level to facilitate an equal relationship.

Commitment, Rigour, Transparency and Coherence

Commitment is the level of engagement the researcher has through the experience of the qualitative method used and knowledge of the field under study. The researcher has undergone postgraduate training in IPA. The thesis so far has demonstrated the researcher's knowledge of the topic area. The rigour of the study pertains to its thoroughness by choosing an appropriate study sample (see section 8.2.2) and the attention to detail in the analysis. The latter was established by treating whole transcripts as data and an audit trail consisting of a chronological extraction and analysis of themes for interview 1 is presented as evidence of this in Appendix 4, (pA38). Transparency and coherence relate to how clearly stages of research has been outlined in the write up and how participants were selected (section 8.2.2), how interview schedules were constructed and conducted and the steps used in analysis to establish if arguments fit between the research undertaken and philosophical assumptions of the approach. Interview questions were constructed based on previous questionnaires for exploring cognitive representations (p139) but were open-ended with a minimum of prompts/ probes. The extraction of themes and the reflexive account provide further support for coherence.

Impact and Importance

Even when qualitative studies are conducted sensitively it has to present something useful about the topic or contribute to practice and policy. This is supported in the results/ discussion section.

Self-Reflexivity

Quantitative research attempts to minimise researcher bias in the methodological process however qualitative research accepts inevitably that the researcher's assumptions and views will have an impact on how data is collected and analysed regardless of attempts to eliminate bias. It is recommended that the researcher declare their assumptions and views that may have impacted on this study (Yardley, 2000; Elliot et al. 1999). These views are provided in the statement below:

I am a British female in my thirties. I have a personal interest in people, well-being and doing sport activities outside work and academia, hence my personal interests have somewhat informed my interest in health psychology. I do not like to place myself into a theoretical box but neither do I like to 'sit on the wall'. Although I have a bias towards being a social cognitivist (especially when they precede behavioural processes) I prefer to take an integrative approach deciding for myself which theoretical models or methods (qualitative or quantitative) are best for studying particular phenomena. For example although I perfectly understand that people socially construct their environments in their own personal way, I believe that they are also cognitively processing these social interactions within the constraints in thinking set upon them by the socio-cultural institutions (e.g. educational, political, religious) for which they came to be who they are. It is in these institutions that individuals will share group communalities in how they think and how they will interpret events. From my experience of interacting with people with dermatological conditions such as CU, I have drawn my own conclusion that it is a condition that can happen to anyone as bio-psychosocial determinants appear to come into play both objectively in the predominant quantitative research literature and subjectively in over 100 patient qualitative narratives at the urticaria clinic. I am also diagnosed with idiopathic CU (i.e. of unknown cause) and this was discovered at this same urticaria clinic several years ago. It is this situation that ultimately positions me as both a researcher and patient trying not to make prior assumptions about the study data being analysed and being mindful not to ask probing questions that only 'find' themes within the data that is saliently reflective of my own personal subjective cognitive representations of CU.

8.3: Results and Discussion

8.3.1: Overview of Master and Sub-ordinate Themes

The verbatim accounts of participants clustered around four master themes and twelve subordinate themes (1) which are presented in Table 8.2 (p221) with an indication of where they can be found in the interview transcripts (See Appendix 4, pA38).

Table 8.2: Summary of Master and Sub-Ordinate Themes

Master Theme: Sub-Ordinate Theme	**Karen**	**Hanna**	**Paula**	**Mary**
A Self that is difficult to understand or be understood				
1: An Anomaly that needs to be understood by the self	6: 229-234*	2: 37-41	5: 182-185	4: 125-6
2: An Anomaly of the Self that others don't understand	1: 2-4	4: 148-50	1: 3-5	1: 13-15
3: Perceptions of a Body that is at War with itself	2: 31-32	1: 30-31	1: 32-33;	2: 35-363: 77-80
It Will Go but It Will Come Back				
1: Predictability verses Certainty	*7: 237-246*	2: 53-4; 2:63-4; 139-141	3:88; 3: 90-91; 2:53-55	2: 35-7; 3: 113-5
2: Fear of Reoccurrence	6: 212-18; 5: 171-3	5: 160-163	5: 162-165	3: 105-7
3: Loss of Control over the Self	3: 94-95	3: 88	3:85	5: 85-6
4: Strategies that keep it at bay are often limited or ineffective				
Oral	5: 151-154	5: 169-171; 3: 92-6	3: 109-110	
Topical	5: 189-90; 6:191-92; 6:202			
Dietary	3: 103-105			
5: Barriers to accessing help when it comes back	7: 246-249; 254- 6	4: 122-127		6:200-4
Psychosocial and Appearance issues ascribed to Itching and Swelling				
1: Feelings of Shame & Self-Consciousness due to Fear of Exposure	3: 74-76	3: 79-83	4: 153; 5: 158	4: 149-156
2: Impact of CU Appearance & Symptoms on Personal Relationships	3: 78-80		3: 80-1; 4: 149-151	5: 158-160
CU Medicines as a Health Threat Verses Health Saviour				
1: CU Medicines as a Necessary Evil	4: 129-131	4: 112-117	4: 124-26; 4: 141-145	6: 208-11
2: CU Medicines as a Friend verses a Foe	4: 120-121; 4: 137	4: 119-120	3: 109-10; 3: 113; 4: 114-16	6: 204-06

Note: *Denotes page number in transcript followed by line number in transcript in Appendix 4 (further examples are presented in text)

8.3.2: Master Theme 1: A Self that is difficult to understand or be understood

Three themes identified appeared to cluster around one master theme that was labelled *a self that is difficult to understand or be understood.*

Theme 1: An Anomaly that needs to be understood by the Self

The first theme revealed a need for the women to learn more about their CU beyond the formal diagnosis they were given but some perceived this to be more difficult than others:

Hanna: ...*there's not a lot, there isn't a massive amount out there but when I was told what it was I sort of did a bit of research online but that's about it but there isn't a huge amount to find out really. I think all erm certainly not for sort of like me there might be for medical professionals but I don't really understand that so there's not a lot for just me (2: 37-41)*

Paula: *erm, after I was diagnosed at my GP and then referred to a couple of places before I was referred here [St Thomas'] I was researching around it and my mum's a doctor as well so researching with her and the internet research and library researching you know the causes and the treatments, there's quite a bit of information on it (5: 182- 185)*

Mary: *I've researched I've looked on the Internet I just know what all the possibilities are (4:125-6)*

Karen used the interview as an opportunity to access lots of information that she was struggling to find elsewhere (this occurred after the interview had ended)[1].

Karen*: I'd be interested to know whether there are studies on it and whether there is likely to be a cure. Do you know anymore than I giving you have access at the clinic? (6: 229-234)*

In these accounts the women seem to be thinking about their own understanding and predicament. After an initial diagnosis of CU by their practitioner they appear to indirectly reveal a lack of enough disease information in order to comprehend what they are going through. Such an interpretation comes from a need to seek more information about the condition, which comes from a range of sources. How one comes to learn more about CU appears to be dependent on one's ability to systematically research the available information out there (i.e. the internet, libraries) and having access to those with the skills and knowledge to understand more (e.g.

[1]As the participants in this IPA study were recruited as part of the intervention study reported in Chapter 9, they had the same opportunity as these participants to ask questions which would facilitate in changing their perceptions of their illness.

mother being a doctor, access to ask experts). These factors seem to impact whether a little or a lot of specific information will be found and at the right level to understand what has been found. Such accounts are not uncommon as in the face of an illness crisis one of the most common illness (or health seeking) behaviours is to find out more about one's condition (Chung et al. 2010). In the preceding study one of the most prevalent coping strategies in CU was to seek instrumental social support (52.5%) and this had been supported in the published research literature by Chung et al. (2010) who reported this to be as high as 75.0% of their CU sample. In a larger context the women's quotes further show a need for illness coherence, a concept first introduced by Moss-Morris et al. (2002) that is indicative of a meta-cognition where one is thinking about their own understanding of their chronic illness (e.g. Moss-Morris et al. 2002; Cameron et al. 2009), hence seeking information about CU in this context can be viewed as a perception or a coping strategy.

When asked if they understood CU to be an illness Karen and Paula seemed to imply that CU only felt like an illness when symptoms were being experienced at its worst.

***Karen**: When I'm ill with it when it's not but like; now I'm in remission; so I don't think about it but when I actually got it, I find it debilitating and so yes I do (1: 6-7)*

***Paula:** Yeah, it has an effect, when it's at its worst everyday so yeah*

Hanna first appeared to disagree but presented this ideology in a less obvious way. In this interpretation Hanna does not view CU as an illness as it appears not to fit well into her schema of what an illness should be:

***Hanna:** Erm, no not really, no not an illness, no because it doesn't make me feel ill but you know it's, it's a condition I would call it rather than an illness…it's not like your ill, it's just erm, it's a bit like eczema I suppose you know you got a condition it's a skin condition erm I, I wish I could explain it better I guess (5: 176-178)*

Mary was sure that it was and qualified why:

***Mary:** Yes I do…well I've had it forty-eight years so I've had a long time to get used to it. I've been pushed, prodded, poked, stuck with needles you know it's been called different things throughout my lifetime, at times it was idiopathic, sometimes it was autoimmune (1: 13-15)*

These accounts provide a more general insight into what these women believe it means and feels like to be ill. For example a distinction is made between what is an illness (more serious) and what is a condition (less serious) and whether CU is seen as an illness appears dependent on the presence (or absence) of symptoms and/ or how unwell symptoms makes one feel inside. Such views are not uncommon as how one interprets illness is said to be influenced by ones s*ymptom perceptions (e.g.* Hanna: *no not an illness, no because it doesn't make me feel ill but you know it's, it's a condition*; Pennebaker and Skelton, 1981; Pennebaker, 1982; Pennebaker, 1983) and *social messages* of what to expect from ones exposure to their socio-cultural environment (*Yes I do [believe it's an illness]…I've been pushed, prodded, poked, stuck with needles you know, it's been called different things [by doctors] throughout my lifetime;* Scambler, 1981; Freidson, 1970).

Theme 2: An Anomaly of the Self that others don't understand

In an attempt to understand CU itself the accounts in this subtheme suggested that others also did not know or understand what CU was:

Karen*: Erm I call it urticaria erm but I know that its autoimmune spontaneous urticaria I know that's what it is but if I refer to, when I speak to people who don't know I just tell them it's allergies because I can't be bothered to explain it but for myself its urticaria (1:2-4)*

Paula: I do call it urticaria, it feels like it's, at times it's been like a big, it's like I call it when I describe it to people allergies and that I have a rash because obviously, it's so unheard of [laughs] (1: 3-5)

Hanna: I've had it since I was thirteen when I first had it and again everyone said it was allergies (1:26-27) It's a funny condition because you try and explain it to people and then they don't get it until they see it (5: 175-176)...I guess it's a bit like they do ask me what is it, what's causing it, why can't it be cured but I don't know, I don't know, I don't know. They don't seem to think that you just have it and you have to live with it (4:148-50)

Mary expressed ease in explaining CU but as an allergy none the less:

Mary: Usually in laymen's terms I say to them erm if you can't eat strawberries it's that kind of thing or if you've had an anti-biotic that's disagreed with you that's the kind of thing it is on steroids [laughs] usually that's what I do I'm very open I will talk about it with people who ask me about it…I'm not ashamed of it, not proud of it either but live with it so I'm happy to explain (2: 70-74)

These quotes indirectly imply that the women come to an understanding that their illness is little known to significant others and the general public and this view is qualified by the women's need to frequently explain it to others. CU also appears to be difficult to explain for those who experience it and the best way to explain it is to liken it to a predicament that most people would have experienced at least once in their lives: an allergic reaction. This comparison seems to clarify the nature of CU to others in most cases but Hanna's experiences indicate that some may perceive CU as an actual allergic reaction that does not need to be self-endured. It is not surprising that these women would use allergy as a synonym for CU symptoms as the end result and appearance of this skin disorder is identical to that of an allergic reaction (Brown et al. 2007; Kulthanan et al. 2008). Most people will also have had an experience of an acute allergic reaction resulting in the wheal and flare of urticaria commonly known as nettle rash or hives at some point in their lives (Schofield et al. 2009), hence such an explanation immediately allows one to empathise and begin to place themselves in the women's experience. What is most pertinent here is that the women themselves appeared to have an understanding of other peoples understanding of what an allergy is. This understanding is in terms of its abstract label and concrete symptoms and sensations perhaps reflecting a common understanding learned from illness information assimilated from within a common socio-cultural environment.

A closer analysis of the dialogues appeared to reveal a relationship between the women themselves initially believing the condition to be actually caused by an allergy and a perpetuation of such beliefs by continuous misdiagnoses by doctors also trying to understand

Karen: Not until I got my diagnosis erm I mean I've had it erm, I'm 50 now and I've had it since I was 29 but for many many years I thought it was allergies so I was probably diagnosed, I'm not sure 5 or 6 years ago was when I actually finally was diagnosed with the condition, that's when I first heard of it (1: 20-23)

Hanna: Only after going to see many erm doctors because originally it was classed as an allergy so I went to all the allergy clinics and had all the tests and stuff so for ages it was just allergy and then it was diagnosed as urticaria eventually but it took a while erm so once I knew what it was why I call it that (1: 7-10)

Paula: As a baby myself I had what the doctors thought was an allergic reaction, when my feet swelled I couldn't put my shoes on and it did spread and it had the wheals and the classic symptoms of urticaria and so I'm 31 now, I guess that's been a break (2: 57-60)....[As a child] they suggested a lot of things and I had lots of allergy tests but within six months it had gone again completely and so they didn't find any pattern with it [2:66-67].

Mary: I think it was just I got the impression it was much a learning process for the person who was doing the tests as it was me trying to find out so (1: 9, 13-17). My earliest was four I erm remember being told that I can't eat grapefruit, they probably didn't know what it was and just like an allergic rash so just picked something and said you can't eat that so erm I just avoided grapefruit for erm for a lot of years (1: 19-21)

A commonality across transcripts was the women's apparent perception that understanding CU was as much a journey for diagnosing health professionals as it was for the self. CU is portrayed as a little known illness often misunderstood by clinicians trying to diagnose it and so difficult to understand that even doctors themselves come to instinctively labelled CU symptoms to an unknown allergy. Similarly across transcripts the women noticeably had to experience undergoing many tests, interventions and labels for their illness experience over many years before a final diagnosis of idiopathic or autoimmune CU was diagnosed. Such experiences suggest that from the process of first experiencing symptoms to diagnosis it was initially accurate for these women to explain the illness as an allergy.

Such accounts of these women's lived experiences are indicative of what others living with CU maybe experiencing. In respect to these women's specific experiences it is known that CU is not comprehensively understood and expert researchers and practitioners are always trying to find answers as to its aetiology, process and treatments which varies considerably between patients (Zuberbier et al. 2009a, b). It is not uncommon for patients with CU to undergo numerous tests to identify what they have (Zuberbier et al. 2009a, b; Kozel et al. 2003). In fact a recent survey of 776 health professionals (including dermatologists and GP's) it was reported that 82% had attempted to find an underlying cause for CU symptoms with very limited success (Weller, Viehmann, Brautigam, Krause, Siebenhaar, Zuberbier and Maurer, 2013). Further, less than one-third was familiar with CU management guidelines that reflected in important early

diagnostic tests such as the ASST (only undertaken by 10% of practitioners) and 23% had prescribed sedating anti-histamines, which are no longer recommended. Ferrer, Jaurequi, Bartra, Davila, del Cuvillo, Montoro. et al. (2009) had earlier found similar results when they reported that practitioners found it difficult to implement CU guidelines and so prescribed large amounts of sedating anti-histamines. They concluded that non-experts appear to experience difficulties in differentiating between CU and physical urticaria that may inevitably affect disease-control and patient satisfaction.

The above studies demonstrate that CU is complex. Urticaria itself can be both an illness and a symptom of another disease and is often co-morbid with forms of urticaria (Brodell and Beck, 2008; Zuberbier et al. 2009a). Such complexities may be perpetuated by beliefs that CU is caused by allergy even though this is rare (Kaplan, 2004; Zuberbier et al. 2006). Such complexities have lead dermatologists and patients to label CU as an enigma (Zuberbier, Grattan and Maurer, 2009) and health professionals often view patients with CU as '*difficult to satisfy and hard to guide'* (Weller, Viehmann, Brautigam, Krause, Siebenhaar, Zuberbier and Maurer, 2012). The women's individual reports indeed reflect that CU is difficult to understand by the self and others.

Theme 3: Perceptions of a Body that is at War with Itself

In a variation on this master theme, the sample verbalised their own understanding of what they believed to be happening inside them and why during an episode of CU:

Karen: It's my own immune system that's erm attacking me, that's how I see it, it's my own body attacking me and I'm not sure really what triggers that but what's happening (2: 31-32)

Paula: I, maybe physically doing too much for myself, feels like I'm fighting myself from the inside out....like my body is fighting myself when I feel too tired, too tired my body, when I'm exhausted I watch out (1: 32-33; 2: 35-36)

Hanna: I assume that like an allergy your bodies reacting to something but I don't quite know what (1:30-31)

Mary: My immune system is attacking itself & when it attacks itself it crashes a bit like a computer does & you like the blue screens of death & then all hell breaks loose until it kicks up symptoms of diseases & there are a lot of autoimmune diseases so that's my own understanding of it (3 :77-80)

Despite a lack of specific formal content in their vivid descriptions the women demonstrated an understanding of their bodies overall reaction during the CU pathophysiological process. All used terminology such as *body attacking, fighting myself from inside out* and *bodies reacting to something* implying that the body is somewhat at war with itself. Only Karen and Mary use the formal term *immune system* and *attacking* reflecting some knowledge of their skin disorders implicated origins in altered immunity (both have autoimmune CU subtype). In contrast the absence of these terms in Hanna and Paula's accounts appear to reflect their idiopathic CU diagnosis as they used the words *reacting* and *fighting* instead. The idiopathic nature of her CU seems to imply a need for Paula to combine her explanation of CU process with a guess as to a cause (becoming too tired or exhausted). Hanna in a different way uses the word allergy to describe the CU process but the "...*like an allergy*" in her reply suggests that it is not allergy or caused by allergy but using the term makes for a good analogy for articulating the CU process. Mary also makes use of an analogy and likens her failing immunity to a computer system breaking down which also implies a causal factor. These personal accounts are what one may expect in respect. Though not an allergy (Kulthanan et al. 2008) CU follows a similar patho-physiological process (see section 1.2, p4) so the use of such battling words to articulate it to others is a logical one. The research literature also supports that up to 50% of CU cases is implicated somewhat in auto-immunity (Kaplan and Greaves, 2009; Sabroe and Grattan, 2006) where the body is literally attacking itself but idiopathic CU is not immune or allergy related and any implicating factors usually serve as exacerbating factors as to causes.

Before symptoms appeared the women's accounts support that they were all aware when they would to be in the face of an illness threat as they felt sensations building up, knew

that they meant CU and could predict what the outcome would be:

Karen: I know its autoimmune spontaneous urticaria...hives which can be on any part of my body & erm angioedema whereby my lips and my eyes all swell up as well….I feel it coming on, it feels tingly, knows it's coming can feel it you know coming up a part of my skin

Hanna: Urticaria that's what I call it...I get big hives on my skin'...my hands my feet will swell up so that I can't bend my fingers you know their so swollen. I get it in my joints particularly on my elbows & that's really painful. I can get it in my mouth, in my eyes, in my throat or just... hives on my skin

Paula: I do call it urticaria...when it comes up the ordinary urticaria, the tingling & erm at home or when at home again I can feel it be it comes up and makes all of my skin quite sensitive...the pressure urticaria would make me have wheals and swelling at least on my feet (1: 03, 18-19)

Mary: I come out in a rash…spectacularly…when I was a child it was a rash erm & it would start either on my arms, knees…pressure points…in cold water my skin would just go blotchy then it would itch for days…progressed as I got older, menopausal…angioedema & anaphylactic shock & urticaria vasculitis (1: 26-28) If I take a lid of a jar & it won't come of it's got resistance cause it's too tight I know that my hands going to swell up latter & erm it tingles & I know it's going to…I get a tingle in my lip so I know my lips gonna swell up & when my eyes are gonna to swell up… it's just a feeling (2: 40-43)

Mary also refers to CU as 'IT' in a likely attempt to separate CU, an external entity from herself:

Researcher: what is your own name for it?
Mary: IT [laughs]
Researcher: It?
Both: IT [both laugh] (1: 2-5)

In an attempt to understand CU Hanna and Paula express feeling singled out, as the one who has to deal with CU symptoms.

Hanna: *I don't really know why it happens I don't know what causes it I don't know what I can do to avoid it I you know I don't know why I had it in the first place (2: 43-44)*

Paula: *I don't know but it doesn't make sense to me with the ordinary urticaria of why and don't know exactly why and why me other than anyone else (2: 39-40)*

...and again both women provide possible respective explanations of maintaining and causal factors.

Hanna: *I don't know but I do know that it's made worse by stress... erm & I think the more stressed I got about it the worse it got & that you know I think the stress didn't help (2: 49-53)*

Paula: *I don't know why it doesn't make sense to me with the ordinary urticaria...(2: 38-40)I had my daughter and then immediately got it, you know before she was almost 6 months old it felt like it was a result of that but just from my head that is you know (2: 48-50)*

Karen and Mary's diagnosis of autoimmune CU seemed to help their understanding:

Karen*…Linked to having an underactive thyroid that's what I believe, that's what I've been told erm but erm my underactive thyroid is under-controlled (2: 45-7)*

Mary: *Something that happened when I was born. I think I was just born with slightly weird immune system that's what I prefer to think about... I think it's just part of me, it's something my body decides to do to me every now and again (3: 93-96)****…***I've been clutching at straws trying to relate it to you know when it flared up was I stressed was I when it came back? The stress thing I always erm I absolutely understood if I'm stressed it doesn't help. I absolutely do not believe that stress caused it erm chiefly (4:139-41)

There is considerable support that stipulates that in the face of an illness threat individuals apply the symmetry rule first proposed by Meyer et al. (1985). It describes how individuals experience symptoms, search for abstract information and find a cognitive schema (or label) for that experience that in itself is based on concrete evidence undertaken by searching for body sensations (Meyer, Leventhal and Gutman, 1985).

The symptoms cognitively represented by the women as CU (i.e. itchy wheals, swelling causing pain) are in line with a medical understanding of CU (Zuberbier et al. 2009a) and expressed together with the sensations experienced (e.g. tingling) create a vivid picture of these women's experiences which mirrors study reports by Yosipovitch et al. (2002). According to Leventhal's common-sense model these perceptions (known as ones *illness identity)* initially develop through personal experiences of illness and/ or symptom perceptions. Much of the initial research on symptom perceptions was undertaken by Pennebaker and colleagues (Pennebaker and Skelton, 1981; Pennebaker, 1982; Pennebaker, 1983) who demonstrated in a series of studies how one perceives symptoms is influenced to some degree by how much they focus on internal states and how this is interpreted from their cognitive schema. However illness identity has been shown to share inter-correlations with other empirically known illness perceptions

including attaching causal attributions to one's illness. As stated earlier the women give their CU process an illness label but causal links are made. Except for immunity, psychological stress and stressful life events are evident in their accounts as casual or maintaining factors. The former is made explicit in the transcript examples and the later involve examples including childbirth. These women's accounts mirror Berrino et al.'s (2006) study which reported that 30% believed their CU was caused by psychological factors and Ozkan et al. (2007) in their study found this to be as high as 81%. As highlighted earlier there is no definitive cause found in up to 70% of CU cases (Saini, 2011) but as suspected by these women there is evidence supporting a role for pychological stress in CU cause, maintenance and process (e.g. Broza et al. 2008; Chung et al. 2010a; Dyke et al. 2008; Section 1.2.3, p8).

8.3.3: Master Theme 2: It Will Go but It Will Come Back

The second overarching theme clustered around perceptions that CU was an unpredictable illness with an uncertain prognosis. Accounts provided across transcripts suggested that the only thing that was predictable and certain was that it would go away, but it would always come back but the timing of such certainties could not be precisely predicted. A lack of predictability of the certainty of remissive and active states presented with related themes concerning the limited strategies available to control it personally and the accessibility of gaining treatment control strategies when symptoms spontaneously reappeared again.

Theme 1: Predictability Verses Certainty

A major theme across all transcripts was the belief that CU is very unpredictable and there is no way of determining when it would come and go but what was certain was that sometime in the future it would definitely come back:

> ***Karen**: [what] I find very frustrating about it is that because it's one of these illnesses if you like which goes into remission so you have months of not getting it then one of the last times it happened to me it came back very, very suddenly. It was worse than ever and I had no medication at that point (7: 237-246)*

The lack of medication implied that it could not be predicted when the reoccurrence of symptoms would come back in order to retrieve medications for a pre-empted outcome. Further examples of this certainty-predictability phenomenon are revealed in accounts provided from different parts of the transcripts.

Hanna:…the stress didn't help I, but anything else I don't know it just seems to be completely random (2:53-54)....since I was 22 I've had it more regularly but I've just had two years without any symptoms erm but it's started to come back again so I'll go through another round with it I suppose (2: 63-65)...you know you think here we go again & you know the and you can't see at as you don't know when it's going to stop you just you know there's no, there's no end in sight to it (4: 139-141)

Paula: No, not on any level, at any time, I don't feel I have control over it (3: 88)....Because of it being so spontaneous, I still, maybe I do have some degree of control but it's certainly not predictable for me for at least three years (3: 90-91)...Erm, I think it feels like it has come to me maybe three years ago and it barely, it feels as if it's burning out now and less frequent and know I maybe have it on and off through my life (2: 53-55)

Mary: The duration of the flare-ups as well used to be 6 months to a year then it went to 4 years, 5 years, 6 years so yeah a bit of a rollercoaster (2: 35-37); Everything that goes in me or on me will react so I prefer to just think that it will come back. I find it psychologically easier to deal with it will come back (3:113-115

Three of the women perceived CU as life-long and probing further into such perceptions resulted in the following responses:

Paula: *because of what doctors here have told me about the burnout cycle and erm because as a baby myself I had what the doctors thought was an allergic reaction, when my feet swelled I couldn't put my shoes on and it did spread and it had the wheals and the classic symptoms of urticaria and so I'm 31 now, I guess that's been a break (2: 57-60)*

Karen*: Erm well I've had it now for twenty something years and you now that the hospital, their wonderful but I've never been lead to believe that, never been given an indication that there is a likely cure (4: 141-146)*

Hanna: I've never been given anything or any idea that there might be something that stops it (3:95-96)

The sample appeared to come to terms with the belief that they would be living with an episodic illness with uncertainties about a cure ever becoming available to stop it returning.

Paula: No, I don't believe that [a cure] because there is just so much trial and error, things with the medications no, maybe there will be I'd like to think that there would be but it just even with the medication it just still feels out of control so I'm struggling to have faith in that (4: 28-30)

When participants were probed further there seemed to be a common understanding that a cure is uncertain because CU is not deemed as important, large scale or serious enough to gain adequate funding for finding a cure.

Karen: My belief is that it probably erm I don't know that's but I'm guessing that it does not get as much money on research and stuff because it not life threatening necessarily and so my guess is not so much money spent on it erm so I don't think that there will be a cure, not in my lifetime. [Lower tone] I don't think so sadly.....I wish there was (4: 141-146)

Paula: I think because research is on a small population in country suffer from it I guess urticaria and all the research being done all of the time I think maybe it's there's not a lot of funding in it I guess because of the small population I'm not sure that's just really my naive opinion, yeah [laughs] (3:95-96)

Hanna took the alternative view that CU is too multi-factorial for a cure to end it all:

Hanna: I suppose it's difficult if you don't know what causes it. If its stress and a cure for stress well I suppose I don't think so as everybody has different triggers as to what causes it so I don't think they will be a cure [at] all for it I doubt it (3: 103-5)

Mary's response implied that in the time she's had CU [48 years] they would have found one by now

Mary: ...Probably because I've had it for such a long time

Words and terms such as '*random',* '*go through another round with It*', '*bit of a roller-coaster'* and *'back suddenly'* seem to depict the women's feelings of the unpredictable course of CU and lack of identifiable markers that one could use to predict itse return. What they do reflect is a timeline perception (Moss-Morris et al. 2002) where chronically ill individuals create distinctly separate cognitions as to the chronicity and cyclical timeline of their condition. The apparent cognitive schema of CU course and prognosis made by these women is in line with a current understanding of CU (Maurer et al. 2011). The unpredictability of CU itself is summed up in its umbrella term chronic *spontaneous* urticaria, the spontaneous meaning that it mysteriously disappears as it first appeared and its reoccurrence is difficult to predict (Maurer et al. 2011). The examples in the women's transcripts imply that this interpretation of CU as cyclical and lifelong may have been strengthened by the long duration of their illness (symptom perception) and

having no clear information provided by doctors regarding prognosis (social messages). In contrast the women's accounts may provide an indirect insight into the medical professions inability to do so as they are also trying to understand CU course that varies considerably between cases (Zuberbier et al. 2009). Overall CU is viewed as incurable due to being too rare and heterogeneous which here seems to equate to CU being a poor candidate for research funding.

Theme 2: Fear of Reoccurrence

The second theme was centred on fears of the condition coming back after a period of remission. Participants gave accounts implying that one should not dwell on this coming back but put strategies in place to deal with a possible reoccurrence:

Hanna: think you just deal with it, I just hope I'm not gonna have an attack. I do worry that if I've got something planned that it erm its not gonna crop up and I might take a, make sure I'm taking my medications a week in advance, cause sometimes you take it and it's been a while (5: 160-163).

Mary: Mine comes and go in cycles. The way I actually psychologically deal with it is to never think it's gone, never think it's gone that's how I deal with it. It's kind of better the devil you know theory. I can't cope it breaks my heart every time it comes back (3: 105-07).

Karen: For my fiftieth birthday I didn't drink I was frightened of triggering it erm so my thought process is to think positively and just give myself the best shot of it not coming back. One of the things they say triggers it is stress. It's very difficult to avoid stress in your life but when I am stressed its erm very, very aware that I might be causing it to come back. The other thing I don't ever do which is a change in my life style never sunbathe, I used to sunbathe a lot, I used to go abroad on holiday to sunny beaches and lay on the beach, never, ever sit in the sun now (6: 212-218

A closer observation of Karen's transcript revealed what appeared to be a contradiction in her above account and an earlier dialog regarding a fear of reoccurrence (i.e. thinking about CU and also not thinking about CU during remission):

Karen: yep but when it's not with me for months like now then I'm I don't think about it. I not thinking everyday its coming I generally just don't think about it but it's just, in fact I kind of always make a point of not thinking about it 'cause I don't want to tempt fate (5: 171-173)

Holding such a view seemed to reveal a difficult situation for Karen that she might not have been aware of that by trying not to think about it and tempt fate she actually thinks about it (i.e. what to do) in order to avoid the reoccurrence. This is demonstrated again in the following response were Karen indicates another change in her health habits plus a developing self-awareness of self-regulating internal bodily states:

Karen: Erm it's made me become more health conscious, I don't drink alcohol at all for fear of triggering it, I erm, I still exercise but I am much more conscious of not exercising enough or too hard (2: 59-61)

Paula also affected by co-morbid delayed pressure urticaria (or DPU)[2] also verbalised preventative measures but found this easier to do for the DPU as she knew what the causes were as to the CU which she stated earlier "*I don't know but it doesn't make sense to me with the ordinary urticaria" (2: 39).*

Paula: erm, I guess watching time again with my lifestyle making sure I'm moving, buy big baggy clothes and not wear socks all day, plan my day and time with my kids and things and outside socially so that I'm not on my feet a long time or wearing the same type of clothes all day so it's the physical things that I can do to avoid the pressure urticaria (5: 162-165)

Researcher: Okay, you said the pressure urticaria affects you more than the ordinary urticaria [CU synonym]

Paula: Yes I think so and if I can avoid it slightly [the CU] it's easier as well (5:166-167)

These transcript examples imply that the women are always thinking about CU whether they are actively experiencing CU symptoms or in a period of remission as in these states a variety of cognitive and behavioural coping strategies are in place to minimise the impact of reoccurrence even when reoccurrence cannot be predicted. Whether it's taking medications a week before social events, avoiding alcohol before birthdays, avoiding the sun and stress or changing exercise behaviour one must maximise the chance that CU will not come back especially at times were it could possibly coincide and interfere with important events. The incorporation of coping strategies to minimise serious consequences highlights how CU seems

[2]Delayed pressure urticaria is a physical urticaria caused by applying pressure to the skin (e.g. by wearing a belt, bra, watch or simply sitting for too long. Over the course of the day, such areas with result in a weal and flare reaction)

to be placed at the core of ones existence for which all future planning and decisions are based upon. Such experiences of CU are not dissimilar to other reports in this thesis and in the published research literature. O'Donnell et al. (1997) in the first study of CU on quality of life found that 46.0% of their 100 participants reported concerns about the unpredictability of CU and Chung et al. (2010) found that individuals with CU tried not think about CU (73.0%) but concentrated on self-management procedures (68.0%) and finding solutions (66.0%).

Theme 3: Loss of Control over the Self

The most transparent and succinct response was that CU is not a condition that one personally controls but one that as a separate entity totally takes control:

Karen: When it is with you and it's got its grip on you it's debilitating (2: 63-64)...no I think it controls me when it's with me (3: 94-95)

Hanna: *No, no not* at all. No I don't know how to control it don't know what to do (3: 88)

Paula: *No, not on* any level, at any time, I don't feel I have control over it (3: 85)

Mary: *None, no* control over it whatsoever, absolutely no control. No it can be very, very overwhelming and erm my faith really helps me with that. (5: 85-6)

Mary's way of dealing with it was to see the CU as a separate entity to the self and by doing this she could cope better with it:

Mary: it's all encompassing if you let it get a grip on you which is why I call it IT and which is way I say I got IT, IT hasn't got me I deal with it better that way because if, if I let IT get control of me, my god it's a horrible place to be (6: 224-6)

The multiple use of the word *no* at the beginning of three of the four extracts together with terms such as *grips on you (Karen, Mary), don't know, overwhelming, debilitating, all-encompassing* in response to the ability to personally control CU appears to show the women's overall feeling of complete helplessness to exert any control over the emerging symptoms and sensations they are experiencing. Together the words imply that one will be paralysed to undertake any other life activities and will just have to let the process happen as inevitably they

have no choice. In Mary's extract she separates CU from the self and turns to religion implying that an outside force bigger than herself maybe the only source of comfort for her.

At first such words and the interpretation of them seem to contradict the interpretation of the previous theme in that a range of active and positive coping strategies are reported in order to cope with CU and minimise reoccurrence. One interpretation is that maybe despite ones active efforts to prevent reoccurrence in remission or reprieve days, when the symptoms do arrive nothing in place is strong enough to stop it. In study 4 the data indicated that a strong illness identity and high emotional representations significantly related to a greater use of negative cognitive appraisal coping (as would be predicted) but also proactive coping. Positive and negative coping procedures also related to poorer outcomes. Conclusions were made suggesting that enforcing positive problem solving strategies in the face of what seems to be an uncontrollable situation may result in poor adjustment similar to negative forms of coping (Carver and Conner-Smith, 2010). Such an explanation seems applicable here. The feelings of lacking personal control over CU may further indirectly indicate a highly bio-medical approach to self-regulating CU, relying heavily on treatment control outcome expectancies, which is understandable as this is how CU is currently managed (Zuberbier et al. 2009b). Throughout the transcripts the women suspected that stressful life events could be a maintaining factor but these were never considered in terms of how to personally recognise, control and manage such circumstances.

Theme 4: Strategies that keep it at Bay are often Limited or Ineffective

A frequent topic across transcripts was the role CU medicines and the reliance on them to control symptoms. However despite a dependency on them, accounts implied that they were perceived as often unreliable and ineffective again reflecting the notion of uncertainty in fending of symptoms. Such dependency is reflected particularly in Hanna's account:

Hanna: ...I don't know whether because it just makes me feel better if I'm taking something to be honest, don't know how effective they are but yeah I would like not to have anything you know available (3:108-110)

Mary's response implied that until she finally convinced doctors about the possibility of using cyclosporine (a second-line oral CU medicine) nothing had worked:

Mary: yes I'd like to thank the person who invented cyclosporine from the bottom of my heart. I tried to get on it for years (6: 198-199)

This theme could be further broken down by medication type but regardless of administration similar perceptions prevailed

Oral Medicines:

Karen: They haven't helped me the cyclosporine I say is a very strong drug and it didn't help me but that's my own experience the doctors tell me [there] are people it has helped and the urticaria has gone away forever and I wasn't that person sadly so therefore I would have to say no [they didn't work] (5: 151-154)

Hanna: Not really, there's not a lot you can do it, it just nothing you can do to, to prevent it all anything you just can't get through it so there's really no point in dwelling about it I guess (5: 169-171)...I don't think they do particularly [CU medicines] and I don't know, I mean I've tried various things and at the moment... but I still get the symptoms I don't think it, I don't know whether it lessons it but I don't think it controls it, it certainly does not stop it (3:92-96)

Paula: ...I haven't seen really direct results except for the steroid treatments at all, so sceptical (3: 109-110)

Topical Medicines:

Karen: I think there's a limit to what I can do. I must say I have cold creams, I don't find the creams effective I might get a bit of short reprieve with but I've never found a cream that will take it away or even take the itch away over a period length of time (5: 189-90; 6: 191-192)...I put the cream on and then I will get a bit of reprieve but not forever just a wee while (6: 202)

Other non-medication strategies were also experienced as ineffective and further reflected uncertainties in an ability to stop symptoms coming back:

Dietary:

Karen: when it was bad last time I tried to stick to the diet...and I think it may have helped but I couldn't be sure be course it was coming to the end of its cycle so I don't know but now (3: 103-105)

Paula: yeah, I've followed the food, the food, action sheet with the list of you know cutting out different food groups at different times and I didn't notice an effect (2: 42-43)

Mary decided to take a positive attitude to what she could eat as to what she could not eat:

Mary: I say what I can eat rather than what I can't cause it's just ridiculously long (3: 10)

As the women explicitly implied having no personal control over CU, they also felt they had no external control either with the medication and avoidance strategies available to them. This is in line with CU treatment being dominated by CU medicines, which are often ineffective or are only partially effective in up to 50% of patients (Maurer et al. 2010). Eliciting mechanisms are also rarely identified (Zuberbier et al. 2009b; 2012). CU medicines are a complicated issue and as reviewed in chapter 1 it is not unusual for patients to be prescribed up to four times the licensed dosage and then proceed to second-line and highly individualised third-line treatments with drug combinations which can have harmful side effects long-term (Zuberbier et al. 2009b; 2012). As bio-medical theories of CU cannot predict with interventions will improve which outcomes (Saini, 2011) there is no guarantee that the drugs will work but that the right combination will be identified (see section 1.4, p11 for a review).

Theme 5: Barriers to accessing help when it comes back

The dependence on CU medicines was further reflected in this fourth theme that highlighted a need to have access to emergency CU medicines that do work (i.e. steroids) in the eventuality that it would (at a time that couldn't be predicted) come back.

Karen: I just needed help and I did say to the doctors about that that given the nature of this illness they have to have a system whereby if suddenly you have a flare-up and you feel you need help you need to be able to just get into that clinic without a whole series of very, very stressful phone-calls and that that, that really upset me (7:246-249)...But I think that I cannot believe that I have been the only person to have experienced that, that really stressed me out cause I thought oh my God what more can they do, because it was really bad (7: 254-256)

Hanna: It's just because my GP won't give me [steroids] well I've asked him could I have steroids so that if I do get an attack that I've got them here and he refused this and he won't let me have them and he's like no you can't you can only take them so long not long-term, so I have to go over to my GP physically to get steroids after I've had an attack. I'd rather just have some here to use as and when and I assume there is a reason as to why he won't give them to me (4: 122-127)

Mary: [Cyclosporin] I tried to get on it for years and every time I suggested it to the doctor cause I said I looked on the internet and I knew that there had been success with it and I wanted to try it and everyone kept saying no. and

it wasn't necessary then I started coming up with these photographs and taking them and erm and suddenly I was here and on it before I could blink and I say first tablet everything was fine (6: 200-204)

The selected texts here demonstrate the apparent barriers caused by a health system that does not really understand CU and its cyclical nature. The women's accounts portray the difficulties and perseverance required in order to access steroid medications when they begin to feel CU symptoms emerging after a period of remission. This experience itself seems to be a stressful one that may amplify the attention paid to emerging CU symptoms and sensations and the fear of experiencing an episode with no strategy in place for reprieve. Steroid medications are prescribed in cases of active CU when symptoms are severe due to the possible harmful side effects, hence the difficulties experienced by the women attempting to access them after a state of remission may indirectly imply and confirm research suggesting that non-expert doctors find CU patients difficult to treat (Weller, et al. 2012).

8.3.4: Master Theme 3: Psychosocial/ Appearance issues ascribed to Itching and Swelling

Questions regarding the physical appearance of CU were never asked during the interviews but emerged as an overarching theme across transcripts. In contrast questions regarding mood and personal/ social relationships were asked and were originally categorised as separate themes, however both were always discussed within the context of appearance suggesting the serious consequences of CU was tied up in emotions about appearance. The two sub-themes of this master theme represented a three-way relationship between emotions, interpersonal interactions and the appearance of CU symptoms on the body.

Theme 1: Feelings of Shame and Self-Consciousness due to Fear of Exposure

Accounts indicated that the appearance of CU symptoms had a detrimental impact on the women's self-concept and how others viewed them in public, so much that the anticipated judgement and responses from others of the symptoms appearance could be said to have become more important than the debilitating effects of experiencing the symptoms. In some

cases fear of such judgements due to shame often resulted in feelings of self-consciousness and social isolation:

Karen: when I'm out and about I think, I feel self-conscious, I think people must be looking and thinking what's wrong with her and I couldn't walk the street I should explain it but you know I don't (3: 74-76)

Hanna: if I get it on my face, I'm not going to leave the house and you know it's like I don't want to see anybody because it looks ugly you know big lumps on your skin you know and your hands are so swollen and you can't put your shoes on and you can't go out and you don't want to see anybody. I've had it when my lips have really swollen up you know I don't want to see anybody (3: 79-83).

Paula: Erm just quite self-conscious I guess when it's showing and especially when I've slept a few times and woken up and where it swells on my face and so yeah disgusting, really self-conscious just so self-aware of how I'll be physically looking and going to the hospital to get the medications for the swollen face it's just, it's just awful. I think it could makes me, if I was a less confident person it could make me feel really on edge and need to have time of work for emotional stress and physical (4: 153; 5: 158)

Further accounts by Karen positioned her as a social outcast however the discourse also indicated that she believed she was worthy of others distain almost presenting an empathy for anyone unfortunate enough to be associated with or in close proximity to her.

Karen: I can see it must drive people mad, there's nothing worse than sitting beside someone scratching away it gives you the heebie-jeebies doesn't it [heckles and laughs out loud]

Paula also seemed to adopt this position but believed that her personality enables her to deal with it positively, however eventually she would succumb.

Paula: Erm, I think at first when I was in school and the children would see it on me and go awh what is that on you, it could have [been bad] but because it came and went and that I guess with the older children at school it was okay. It could have I think if I was not feeling okay with myself you know (3: 83-86)...if it was to continue to be bad as it was at its worse point I'd genuinely think my job would be effected I think emotionally I could be really affected and self-conscious and really aware of the physical side of it and how much that effects my life and I have no idea until I suffer with this how people, how physically you feel and how you look matter I guess to me and other people, to children particularly in school (5: 174-178)

…however

Karen: erm I'm different, not totally different yeah I mean I get on with my life I would do everything I would normally do but your waking up and you just feel miserable.

When asked Mary's response implied that she had transcended such experiences over time:

Mary: affected socially] I used to be I'm not anymore. I think as you get older you, you care less really, I prefer now to actually explain what's wrong & people want to know…children particularly full of questions but again you know taking the erm cyclosporine there isn't anything to see, erm I was pumped up on steroids at one point erm which psychologically [was] very upsetting because I've always had a weight problem, I'm always fighting to stay slim and you put me on steroids & [laughs] five stone before you can blink & an awful lot of comfort eating as well as taking steroids it means I could eat so I did [laughs] anything dipped in chocolate, my best friend, [laughs] (4: 149-156)

As stated earlier questions regarding looks and appearance was not a part of the interview schedule but frequently emerged in respect to discussing symptoms and emotions. The women indicated an amplified sense of not only their self-awareness of CU but also others amplified awareness (or perceived amplified awareness) of the visibility of their CU symptoms. They verbalise both its impact on their physical attractiveness and the impact on others who have to see its appearance and watch the associated scratching behaviours. The need to conceal oneself or engage in social isolation appears to be an act that will not only protect the self but also protect others. Together with the need to explain it, get used to it and even sympathise with others seeing it suggests that the women perceive CU symptoms to be both socially stigmatising and an unacceptable condition for which one should enforce a sense of self-blame and disgusts towards the self. This portrayal of CU is in line with Ozkan et al. (2007) who found that 78.0% of their participants reported CU to have consequences regarding a disturbed body image, attitudes towards others, attractiveness and feeling different, self-conscious and embarrassed.

The perception that the self and others should see CU in this way suggests the assimilation and accommodation of negative symptom perceptions and social messages about skin disorder. This interpretation of the women's experience is supported with a strong research literature which suggests that skin disorders are heavily stigmatised in most societies bringing feelings of shame on the individual experiencing it as well as blaming and stigmatising those individuals (Thompson, 2005). In many societies perfect skin is associated with beauty, cleanliness and an indication of good health, bad skin portrayed as ugly, a sign of poor health

and a sign of punishment on the inflicted person (Kent, 2005). Further visible skin imperfections can be seen as contagious (Kent, 2005). Kent & Keohane (2001) found that skin disorder patients experience two types of stigma: enacted stigma: (direct experience of being rejected) and vicarious stigma (observing someone else with condition being rejected by others) and the women state feelings about the former in their accounts but it is difficult to interpret whether these are actual or perceived. Further evidence comes from the social media that strongly projects ideals of beauty and this often includes having perfect blemish free skin (Magin, Adams, Heading and Pond, 2009). Magin, et al. (2009) used thematic analysis and identified a theme interlinking relationships between skin disease, ideals of beauty and the role of media. They found that participants identified ideas of perfect skin mediated by media portrayals and this precipitated psychological morbidity in women but not men. They concluded that there is more pressure on women to look physically perfect, which like in this study would be in conflict with the visibility of CU symptoms.

In study 4, it was the disease-specific QoL outcome of looks (48.7% sample) that was reported to be as marginally worse than pruritus outcome (48.1%) indicating that the psychosocial and emotional aspects of CU can be similarly or worse impaired than the physical aspects that medical practitioners primarily focus on (Magin, Adams, Heading and Pond, 2009). However there is evidence in the accounts that one can overcome these feelings either through personality factors or over time.

Theme 2: Impact of CU Appearance and Symptoms on Personal Relationships

This theme related to the impact of CU symptoms and its appearance on how one interpreted the responses of their partner in private. In the first account Paula states that her husband could not come near her physically due to the effects of her dual diagnosis:

Paula: Yeah, and when it was at its worse my husband couldn't even come near me physically at all 'cause everyday I would have either the pressure or ordinary urticaria (3:80-81)

Indeed such a reply could be interpreted as her husband keeping his distance as not to touch her and exacerbate symptoms but a later quote from Paula implies this talk to be associated to her embarrassment that she becomes unattractive and undesirable when symptoms are visual and could only see her husband responding in line with her developed negative self-perception of the self:

Paula: I think about how it looks on my body or when it's on part of my body show all to my husband when it's on my body just disgusting, it just looks so painful and it is so painful & angry I guess, it's just disgusts me and pain from it (4: 149-151)

Mary describes a similar past symptoms-appearance experience that she has transcended over time.

Mary: I don't like looking at myself when it's bad but again that's something that erm has got easier as I've got older. I think once I got into my forties & I allowed my husband to take photographs of me when I'm bad I was able to take to the hospital (5: 158-160)

Karen's relationship with her partner was less about the appearance of CU but the emergence of a different self ascribed to urticaria symptoms. Paula describes herself as 'more grumpy' when she is experiencing symptoms and seems to attribute such behaviour to exerting stress onto her husband. The operative word here is the use of the word 'probably':

Karen: Oh yeah it stresses my husband... [3 second pause] probably, probably my husband, cause probably I'm more tired because you know you don't often sleep well with it, I'm probably a bit more grumpy (3: 78-80)

However there is evidence in the transcripts that appearance and attractiveness is important to Karen.

Karen: ...might scratch my skin with my nail, it will mean red if you know what I mean that mark will not go away (1: 16-17)

Despite the impact of symptoms and appearance on relationships, significant others were sympathetic to the experience which is highlighted best by Mary:

Mary: We had a conversation not very long ago about erm I am not my illness I have to remind him [husband] occasionally that I'm a can do person not a can't do person...as I said, IT's is not me, I've got IT, IT has not got me & I can find that actually very frustrating to be a victim, to be treated like a victim and I'm not & he's wanted to help

& he does help me, cuddles me when I'm having a bad day ...he's been my absolute rock right the way through & we've been married thirty years... he'll never let me come here on my own & that kind of thing so yes [laughs] (5:16-178)

The impact of the appearance of CU symptoms and the emotional response appears to continue in private as it does in public but is much more focused on issues concerning the ability to look attractive and desirable to one's partner or husband and the conflict it can cause. The transcript examples from the women also appear to indicate the difficulties also experienced for partners trying to be understand which can cause stress for both parties but also a source of support. Again there are indications that such conflicts and becoming at ease with one's body can get better over time. Not much is known about the impact of CU on interpersonal relationships but these accounts are not dissimilar to the impact of chronic skin disorders on relationships found in the wider research literature. Skin disorders are known to impact relationships in respect to appearance and shame, body image, sexual intimacy, coping and adjustment (Anthis, 2005). In a recent study Magin, Adams, Heading and Pond (2010) identified a theme regarding the effects of skin disorder on self-perceived sexual attractiveness, self-confidence, capacity for intimacy and sexual well-being using thematic analysis. They found that issues related to self-image and self-esteem resulted in the avoidance of intimacy even in long-established relationships that related to appearance of the skin and not the genital area.

8.3.5: Master Theme 4: CU Medicines as a Health Threat Verses Health Saviour

In this master theme CU medicines are both a health saviour and a health threat.

Theme 1: CU Medicines as a Necessary Evil

In this subtheme steroid medications appeared to take on the role of a necessary evil one must accept to alleviate symptoms.

Hanna:...with the steroids I suppose cause I don't know you know that they can be quite dodgy to take long-term but they do seem to be the most effective thing to take...I don't really know about it to be honest. If its anti-histamines then there are probably no side effects but anything else I'm a bit weary of long-term (4: 112-117)

Paula: I'd like to think that when it does flare up really badly that on a regular basis there's medication that hasn't got the side-effects of the steroid treatments has I guess to just help manage the illness, rather than feeling out of control with it (4: 124-26)...If there was, no steroid treatment, nothing, I think it would just get so bad that...I think my body would be one whole, erm wheal it will be awful. I think honestly I wouldn't be able to leave the house, I don't think I'd live, honestly, that is a bit dramatic maybe (4: 141-145)

Mary: I was concerned when I saw that the side effects came in a book rather than a sheet of paper erm but compared to what was happening to me erm I was willing to put up with just about anything and something suddenly erm growing an admirable moustache was a small price to pay compared to what I was going through (6: 208-11)

In Karen's situation this can be interpreted as an exchange of losing one set of CU-specific symptoms for steroid specific negative side effects which is very much resented:

Karen: ...the only thing I can do to get a reprieve from it is to take steroids and I hate taking steroids. I hate the steroids makes me feel agitated and puffy and sore and swollen and unwell (3: 92-95)...Erm but then it gets flares up and is really bad then there isn't anything that I like and only thing that can give *reprieve as I said is the steroids. And I hate, try to resist taking them as much as I can (4: 129-131)*

In these accounts it is evident that steroids are the only CU medicines that the women can trust to relieve CU symptoms. The commentaries on steroid side effects in parallel to the need to take steroids implies the intensity of symptoms are so unbearable that they result in a desperation and urgency to seek reprieve from something that they perceive could put their health in further danger. There is strong support that chronically illness individuals weigh up the necessity of taking medicines with concerns about side effects (Horne, 1999; 2003).

Theme 2: CU Medicines as a Friend verses a Foe

Although steroids and other CU medicines were seen as a necessary evil the following accounts reflected opinions regarding generally embracing and welcoming the existence of CU medicines (especially steroids) and attitudes towards medicines in general.

Hanna: Oh I'm all for them, you should, I would take whatever is necessary [laughs] whatever's necessary, yep [laughs] (4: 119-120)

Paula: I'm open minded to actual medication but I haven't seen really direct results except for the steroid treatments at all, so sceptical but open minded to it (3: 109-110)...thinking about having a second child and the methotrexate

that was recommended erm after researching and after the opinions from the doctors here, that wasn't suitable but other than that I've taken any medication that has been recommended by the consultants here (3: 113; 4 114-116)
Mary: Hell yeah [both laugh] yes I'd like to thank the person who invented cyclosporine from the bottom of my heart (6: 199-200) I was a very good candidate for cyclosporine and that I am entirely grateful so yes I do to think
It's imperative because I don't know what would happen without. I probably do know what would happen (6: 204-206)

...however Karen held an opposing view indicating that all CU medicines are bad for your health and indicates that she may feel that they are overused by doctors

Karen: ...don't like any of the medications I have taken always have not felt well when I'm on them. (4: 120-121)**...** I absolutely stand by that I don't want to pump my body full of chemicals (4: 137)

When probed further Karen presented a dialogue that indicated that her perceptions may have stemmed from watching her mother's experiences of taking medicines of which the costs appeared greater than any benefits (known as the necessity-concerns differential concept Horne, 2003).

Karen: I hate with a passion all the medication and I would do anything in my power to resist having to take them. I feel strongly about that... my mother was a very ill women and I watched her for fifteen years of her life on medications and all the side effects and the symptoms none of them seemed to benefit her greatly and just don't want to be that person, it must sound really dramatic [laughs] (2: 64-69)

In this theme CU medicines again can be seen as both a health saviour and a threat but how one comes to such an opinion appears to be assimilated through both symptom perceptions and social messages as it develops for perceptions of illness. The opinions of doctors and watching the experiences of significant others on medicines appear integral to forming the treatment perception as well as one's own experiences of taking them. The final perception my result in a view that CU medicines (and medicines in general) are here to help or are harmful and overprescribed by doctors.

The individual accounts are in line with the research literature supporting that ill individuals do not only have beliefs about the necessity and concerns of prescribed medicines but also about medicines in general and their overuse by doctors (e.g. Horne, Weinman and

Hankins, 1999; Mahler et al. 2012, De las Cuevas et al. 2011; Iihara, et al. 2010; Francis, et al. 2009). Further as perceived by Karen who has an opposing view to the other women, research has shown that concern beliefs may also be influenced by ones perceptions of their personal sensitivity to the side-effects of what they see as harmful treatments and their overuse by doctors (Horne, et al. 2013).

8.4: Conclusion

This study explored cognitive representations and lived experiences in CU. Using the methods of IPA twelve themes and four master themes were established. The researchers overall interpretation of the women's experiences is summarised below and in Figure 8.1 (p249)

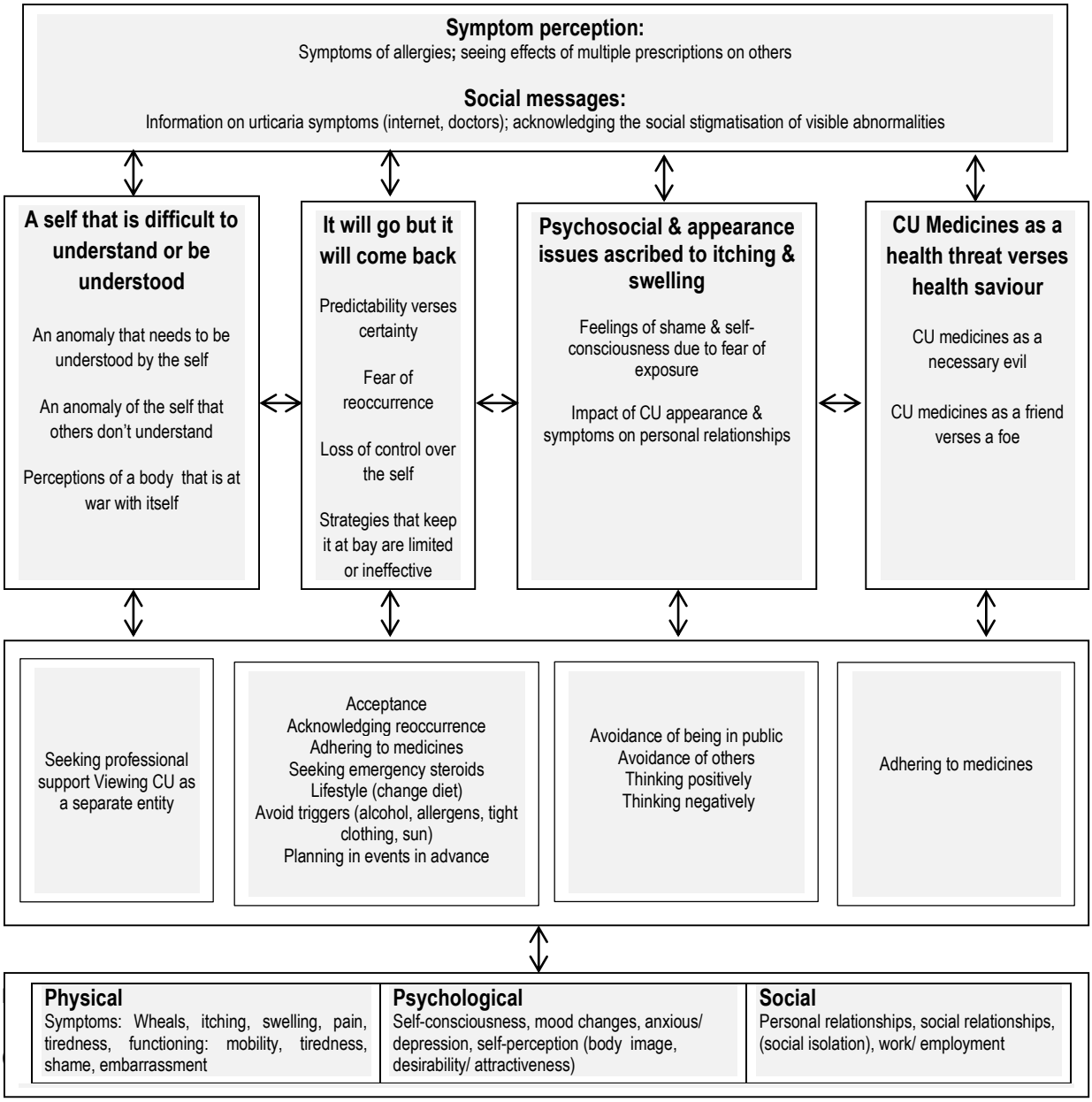
CU is depicted as a chronic skin disorder that is difficult to understand by the self and others (including doctors) also trying to understand its unexplained symptom presentation; an illness that is certain to go through periods of active states and remissive episodes but the presence of such states cannot be predicted. Such certainties and unpredictability induce fears of CU reoccurrence and the loss of self-control over the experience which is further exacerbated by the perceived limited and ineffective strategies available to gain self-control and barriers to access those that work. CU itself induces feelings of shame, self-consciousness and self-blame due to perceived social stigmatisation about visible skin disorders and associated scratching behaviours it encourages which extends to feeling undesirable and unattractive in personal intimate relationships. In order to gain some form of effective treatment control at the worst times one must separate oneself from any negative beliefs about CU medicines (and medicines in general) and embrace the benefits.

The women's experiences in all master themes confirmed study 4 findings that there is a need to change misconceived representations of CU. However, this study differed from study 4 in that it was indirectly revealed throughout the transcripts that health professionals (especially in primary care) also appear to require access to more CU educational resources.

Patient resources that increase a basic knowledge of CU could have a dual purpose. The first could provide information on CU illness and treatment including how the skin disorder

is assessed and diagnosed, its symptoms and process, which factors are known or are associated with its cause, duration and maintenance and the individualised nature of the treatment. The second could be a resource that keeps patients up-to-date on the latest

Figure 8.1: A Qualitatively Derived Common Sense Representation of CU based on IPA



training days that show health professionals how to recognise and distinguish CU from other urticaria and how it is treated. Such initiatives may increase knowledge and understanding that may lead to better decision making about treatment and referrals and better communication

between primary care practitioners and consultant dermatologists. For the patients this may result in better disease control and the reduction of barriers when emergency medicines are required, leading to better doctor-patient relationship and patient satisfaction. However, as the transcripts indicate, problems with CU are not limited to concerns about understanding and treatment but also the emotional, social and interpersonal impact on ones lived experience.

As stated earlier there are currently no psychological interventions available in CU. The findings of this qualitative study and the CU literature suggest that the input of professional psychological services either through referral or by integration into existing dermatological departments is required. Such input could include psycho-education to challenge misperceptions of CU and incorporate action plans of how to identify and cope with potential psychological factors involved in triggering CU (after remission and during active disease) and the helplessness experienced when medical interventions are failing. They could also help with strategies for coping with the emotional aspects and in developing strategies for dealing with the embarrassment caused by CU's appearance and symptoms in social situations and in intimate personal relationships.

The current study highlighted the substantial similarities as to differences in personal accounts of cognitive representations and coping with CU which were consistent with the current medical understanding of CU and the structure of CU services. In addition to highlighting lived experiences in CU for the first time, the women's accounts in this respect may reflect other individual patient accounts and concerns that may arise during consultations and therefore not only compliment quantitative accounts but help in the development of CU specific self-regulation and management strategies.

Chapter 9

Development, Pilot and Evaluation of an Intervention designed to Change Cognitive Representations & Quality of Life in Chronic Urticaria (Study 6)

9.1: Study Rationale

This chapter reports the development, piloting and evaluation of a CSM intervention aimed to establish if cognitive representations of CU are amenable to change and result in significantly better quality of life. It was designed using guidelines by the Medical Research Council (Campbell, 2000; Craig et al. 2012) and CONSORT (Altman et al. 2012), designing interventions in behavioural medicine and health psychology (Davidson et al. 2003; Abraham and Mitchie, 2008) and information from CSM interventions (reviewed in section 2.5, p45). The pilot had research implications for developing an RCT to confirm the study effects and practical implications for incorporating psycho-education interventions into routine care to facilitate better disease management.

9.2: Introduction

With no known cure, the primary aim of CU treatment is to reduce disease-severity and improve quality of life (Zuberbier et al. 2009b; 2012). In order to do so patients are recommended to take CU medicines and avoid exacerbating factors. However as reviewed in Chapter 1 existing bio-medical theories of CU aetiology cannot predict which treatments will impact which outcomes (Saini, 2011) and triggering factors of CU are rarely identified (Zuberbier et al. 2009a, b; 2012). One psychological factor that has been found to be a contributor of illness outcome has been cognitive representations of illness (Hagger and Orbell, 2003) that in study 4 was found to be significant predictors of CU-related quality of life outcomes. Cognitive representations have been found to be amenable to change via intervention leading to improvements in a range of illness outcomes (see section 2.5, p45) indicating that changing perceptions of CU may also improve CU-related outcomes.

9.2.1: Structure and Contents of a CU Intervention based on the CSM

The pilot was structured using behavioural interventions guidelines by Davidson et al (2003) that consider seven structural features in that are explained in-turn below.

(1) Contents and Elements

This current study used Behaviour Change Techniques (BCTs) as defined by Michie and colleagues (Abraham and Mitchie, 2008; Michie, van Stralen and West, 2011). Cognitive determinants of the CSM were not directly mapped to particular BCTs by Abraham and Mitchie (2008) but they did map them to Carver and Schiere's self-regulation theory (Carver and Scihere, 1998) which is a generic version of the CSM (Leventhal, Meyer, Nerenz, 2003), hence BCTs for the former would be relevant to the later. The BCTs are as stated below (see Table 2.2; p48 for details).

(1) Prompting specific goal setting

(2) Reviewing behavioural goals

(3) Providing self-monitoring of behaviours

(4) Providing feedback on behaviour

BCTs recommended by Abraham and Mitchie (2008) fit well into self-regulation theory in that the individual is seen as part of an active problem solving system attempting to self-regulate by applying meaningful goals and achieving them through directed behaviours that remove barriers to those goals (Scheier and Carver, 2003), however undertaking BCT's only addresses behavioural aspects of the CSM. In the CSM the content specific determinants cognitive representations also act as mechanisms of change and are fundamental to the prompting of undertaking behavioural goals. Unlike conventional educational approaches this top-down approach using abstract/ cognitive strategies uses the patient's own model of illness as a basis for filling in gaps in knowledge, challenging misconceptions, providing the patient with a conceptual framework for the illness so that they can recognise that it is still chronic when asymptomatic, hence the new conceptual framework provides the patient with an implicit model to appropriately interpret bottom-up information generated by behaviours (McAndrew et al. 2008).

In line with the model incorrect perceptions are tackled at the abstract and experimental level of the representation (i.e. combining abstract information of the illness along the dimensions of the representation with concrete imagery of the disease). Such strategies are central to CSM interventions however it has been observed that although published studies describe the nature of the disease-specific informational content of their programs, they do not describe the mechanisms of change from the assimilation of the new information or how it is actually accommodated. In light if this incorporated the Representational Approach to Patient Education (or RA) by Donovan and colleagues (2001; 2007).

The RA (Donovan et al. 2001; 2007) combines the CSM with the model of conceptual change by Posner, Strike, Hewson and Gertzog (1982). The model of conceptual change complements the CSM as it explains how individuals go through a process of learning new information, often having to reconfigure or adapt existing cognitive structures in order to accommodate them. The model proposes that we all have a network of concepts in our minds known as a conceptual ecology. These concepts are interrelated and the development of this ecology (i.e. learning) happens in two distinct processes: *assimilation* and *accommodation*. Assimilation occurs when individuals fit new incoming information into an already developed cognitive schema or conceptual framework.

In the context of cognitive representations of illness, the RA postulates that patients already hold knowledge and ideas about their condition and interactions occur between new information being assimilated and the existing cognitive representation. Unfortunately accommodation does not always occur and instead patients may force incoming information into existing ones. The aim of the approach is to facilitate the accommodation process to allow for conceptual change. After a process of conceptual change the complimentary bottom-up approach of action planning follows an initial top-down cognitive process. This is important as evidence suggests that when practitioners focus on the patient's model of illness (top-down) this elicits more patient questions about the illness but it is action plans (bottom-up) that results in more discussion on the psychosocial aspects of treatment and lifestyle factors as to the representation (De Ridder et al. 2007). With the findings of CU patient behaviours reviewed earlier

(Maurer et al. 2008) eliciting behavioural plans after a process of conceptual change may prove critical.

The representational approach acknowledges that as individuals have a well-developed conceptual ecology (those interacting together as a representation of the illness) the process of conceptual change can be difficult as patients may present with resistance if the new information is seen as a threat to their existing representational model. Donovan et al (2001, 2007) suggest that if conceptual change is not spontaneous (as is often the case when the patient has had time to reflect on their views) that links between current representations, coping behaviour and consequences generated by the patient should be facilitated. The RE consists of the following 7 elements: (1) representational assessment; (2) identifying and exploring gaps, errors & confusions; (3) creating conditions for conceptual change; (4) Introducing replacement material; (5) Summary; (6) Goal setting and planning and (7) Follow-up contact: goal and strategy review. Each element is described in Table 9.2, p258).

Remaining elements

The remaining elements of Davidson et al. (2003) were first reviewed in Chapter 2 in relation to how these were represented in previous published CSM interventions. In general CSM interventions have been delivered by psychologists, nurses or a combination of these professionals to a range of patient groups and have been undertaken in either secondary out-patient hospital clinics or university departments where the interest has been in behavioural medicine. Further most have been brief consisting of up to three sessions of 30-60 minutes over 3 weeks on a one-to-one basis with a follow-up phone-call were a generic protocol has been followed but tailored to the patient's individual needs. These remaining elements of CSM based interventions were also considered in the current intervention and are specified further in section 9.2.3 (p257). The study aims are stated below:

9.2.2: Research Questions

1. To test the feasibility of undertaking a CSM intervention in individuals with CU
2. To determine whether changing cognitive representations of CU has an immediate effect on

self-reported disease-specific QoL, generic mental health status (GMHS) and anxiety levels.

3. To establish if the effect on disease-specific QoL, GMHS and anxiety levels persisted at 3 months post intervention from baseline and 3 months post intervention.
4. To evaluate the patient experience over the intervention process

It was predicted that the intervention would be feasible and have an effect on changing the study variables that would persist at 3 months compared to baseline and post-intervention.

9.2: Method

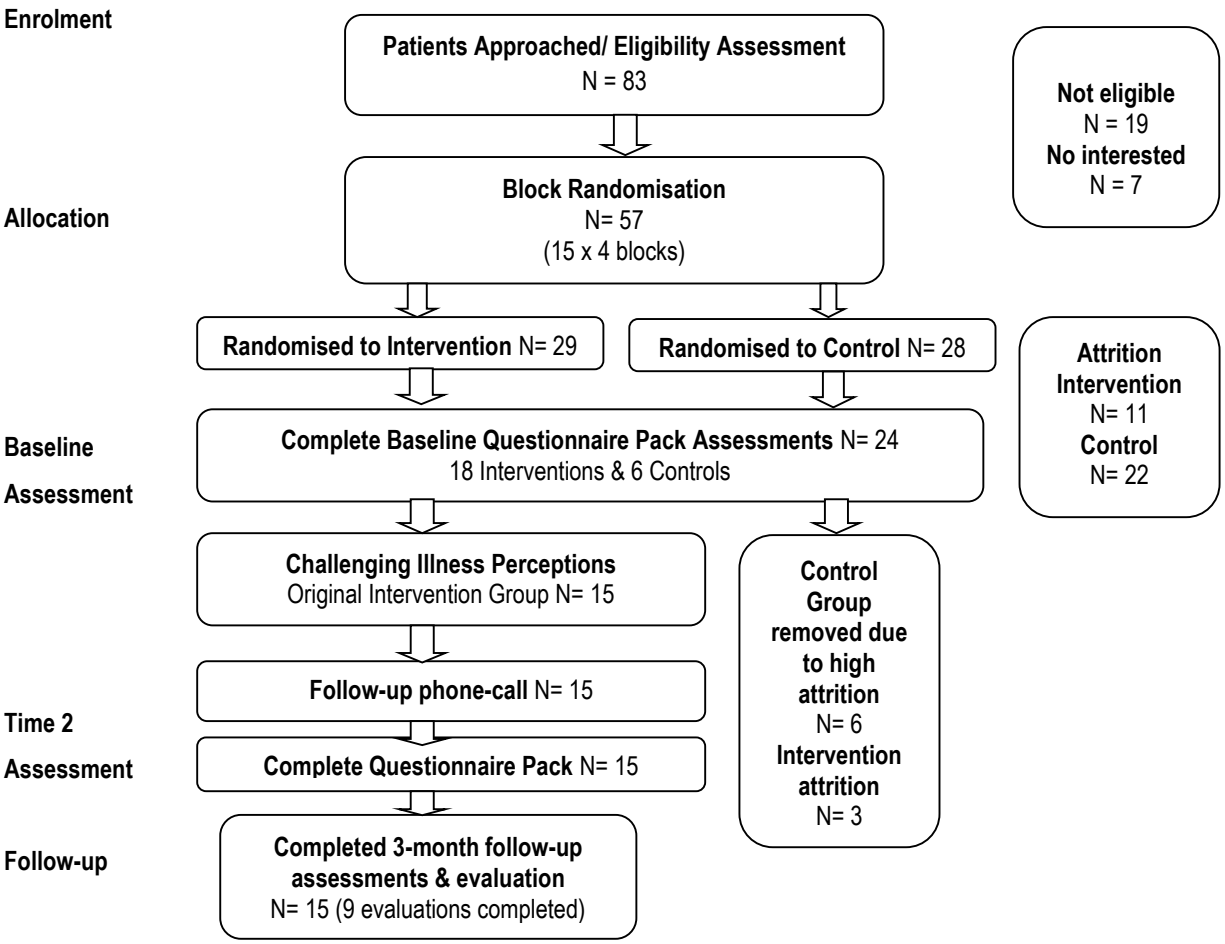
9.2.1: Design

This study was a pilot intervention consisting of a within group repeated measures design where participants undertook the intervention and completed assessments at baseline (T1), 1 month post-intervention (T2) and 3 month follow-up (T3). The dependent variables were changes in disease-specific quality of life (QoL), GMHS and QoL and anxiety over time.

9.2.2: Participants

Participants were recruited from the Urticaria Clinic at St. John's Institute of Dermatology, St Thomas' Hospital London as described in chapter 5 (p134). The estimated sample size was 16 participants. This was undertaken using the programme G Power 3 (Faul, Erdfelder, Lang and Buchner, 2007) for an MANOVA (repeated measures, within-factors), looking for a medium effect size (0.5), a power of 0.8 and probability value of .05 on a criteria of 1 group and 9 measurements per respondent based on the primary outcomes of overall disease-specific QoL, GMHS and anxiety at 3 time-points (his figure was timed by 5 (80) for attrition rates). As the study was originally an RCT, all consenting participants were allocated to the intervention or control group using a block randomisation procedure created by computer programming experts within the researcher's institution. A flowchart of participant's through the study (and the elimination of the control group) is illustrated in Figure 9.1 (p256)

Figure 9.1: Flowchart of Participants through the Intervention Process



A total of 83 participants were approached mostly in the clinic but also by phone to take part in this study. Of these 19 were found to be ineligible and 7 changed their mind after an initial interest to participate. Ineligible participants were confirmed as having a primary physical urticaria or had changes to their medications prior to starting. The greatest reason for not participating included living too far away to attend the study as well as the routine dermatology appointments. A total of 57 participants were enrolled to take part and randomised to the intervention (29) or control group (28). At this point 33 participants were lost to attrition that consisted of 11 interventions and 22 controls. As the attrition rate was twice the ratio of the interventions and numbers were low, it was decided to eliminate the control group, as there was a possibility of losing more of this group that would complicate data analysis. Eighteen intervention participants completed baseline assessments and 15 undertook the intervention and completed post-intervention and follow-up assessments.

9.2.3: The Intervention

This intervention was adapted and formulised with CU specific psycho-educational information and action planning content by the PhD author and is shown in Table 9.1 below.

Table 9.1: Structure of CU-Specific CSM Intervention

No	Structural Element Name	CU-Specific Structural Element
1	Contents & elements	Part 1: Changing Perceptions (See Table 9.3) (1) Representational assessment; (2) Identifying and exploring gaps, errors & confusions (3) Creating conditions for conceptual change (4) Introducing replacement material (5) Summary (6) Goal setting and planning (7) Follow-up contact: goal and strategy review Part 2: Developing an action plan (See Table 9.4) (1) Prompting specific goal setting (2) Reviewing behavioural goals (3) Providing self-monitoring of behaviours (4) Providing feedback on behaviour which were first defined
2	Characteristics of those delivering interventions & its recipients	Delivered by Thesis author a PhD researcher under the supervision of a Registered Health Psychologist. The recipients were patients with a formal diagnosis of chronic spontaneous urticaria (CU) by a consultant dermatologist
3	The setting	Specialist urticaria clinic (tertiary NHS hospital service) or patients home
4	Mode of delivery	One-to-one
5	Intensity	Two weekly sessions plus follow-up phone-call
6	Duration	30–60 minutes
7	Adherence to delivery protocols	Protocol is specified in Section 9.2.6

Contents and Elements

Session 1 Part 1: Changing Perceptions: Representational Approach to Patient Education (RA)

The RA framework consists of 7 elements (Table 9.2; p258). Each are followed in sequence but the researcher can move from one stage to another depending on where the participant takes the process. To fulfil element 1 (*Representational assessment*) the interview schedule developed in Study 5 was used to elicit participant's baseline CU representations (see page 139 and Appendix 4, pA37).

Table 9.2: The Representational Approach to Patient Education

Element		Goals
1	Representational assessment	The patient is encouraged to describe representation of illness along the five components of illness perceptions to identity gaps and errors of perceptions.
2	Identifying & exploring gaps, errors & confusions	The patient is encouraged to talk about experiences that developed illness perceptions and determine their commitment to these beliefs
3	Creating conditions for conceptual change	Goal is to help patient recognize the limitations of their existing conception of illness. How erroneous cognitions can have negative effects. In patients where this does not happen naturally during the process direct links between presentations, coping behaviour and the consequences the patient has self-generated is facilitated.
4	Introducing replacement material	Credible information is provided to fill gaps in knowledge, sort confusions to replace existing misconceptions
5	Summary	The benefits of acting on the new information is discussed
6	Goal setting & planning	Patient & clinician develop goals and actual strategies to improve illness outcome
7	Follow-up contact: goal & strategy review	To establish if the patient was able to do strategies. Problems are identified including concerns. Did goal work and was it reached?

Questions from the schedule are presented one at a time to elicit answers concerning the participants existing knowledge of the CSM component in question and how they developed. As the questions of this schedule are open ended and include pre-empted probes and prompts this allowed the researcher to elicit how perceptions are originally developed and therefore fulfilled element 2 (*Identifying and exploring gaps, errors and confusions*). Misconceptions, negative beliefs and gaps in the patient's knowledge about the component in question is then identified and acknowledged during the participant's response. In Section 9.1 it was explained that individuals have a network of concepts in their minds known as a conceptual ecology which interrelate and develop learning in two distinct processes: *assimilation* and *accommodation*. Element 2 partially assists the former process (i.e. individual's assimilate new incoming information from the researcher into an already developed cognitive schema) as gaps in knowledge are being filled but the accommodation of some of this new knowledge may be restricted as it is not fitting well into their existing concept causing resistance. The conceptual change process occurs in Element 3 (*creating conditions for conceptual change*) and resistance is intercepted by linking gaps, misconceptions

and coping procedures to consequences. It is said to occur when:

(I) The individual becomes dissatisfied with their existing conception.

(II) The new conception presented seems intelligible so it makes better sense.

(III) The new conception seems plausible so it could actually be true.

(IV) The new conception seems that it may lead to a positive cognitive change.

Change may happen when the individual has had the chance to comment on his or her own ideas.

The contents of element 4 (introducing replacement material) is the most detailed aspect of development as it includes the CU-specific standardised psycho-educational material that needs to integrate well within the components of the CSM but also be adaptable enough not to bombard participants with the same generic educational material. Information is presented in a neutral manner and the type and depth of information given was dependent upon the participants existing understanding and the amount of detail necessary. All educational information was derived from Chapter 1 but presented in lay terms and checked by Dermatologists at the urticaria clinic. During this process the researcher is mindful of identifying areas that require action planning. How the interview questions relate to CSM and education material is shown in Table 9.3 (p260).

Although the RA improves the application of CSM interventions, it does not cover emotional representations, which is often absent from CSM interventions (Cameron and Jago, 2008). Emotional representations are linked to held representations to determine if they are warranted and if behavioural strategies could reduce fear. This was especially true for consequences, as this had been intricately related to emotions in studies 5. For element 5 the information provided is verbally summarised and reiterated especially information that was initially challenged by participants before it was accepted to change their conceptual model of CU. The participant has the opportunity to ask for further clarification.

Table 9.3: Intervention Psycho-Educational Material

Component	Common-Sense Interview question	Psycho-educational material	Knowledge summary
Identity	Can you tell me about your chronic urticaria symptoms?	▪Illness label ▪Definition & recognised symptoms ▪Other reported symptoms/ reactions	▪Chronic urticaria (Idiopathic, auto-immune) ▪Six weeks + to years of Itching wheals and/ or painful swelling ▪Sleep disturbance, fatigue
Illness coherence	Can you tell me about what you know about chronic urticaria?	▪CU terminology/ co-morbid urticaria ▪Basic patho-physiological process ▪Diagnostic tests	▪Acute/ chronic/ physical ▪Adapted from chapter 1, in lay terms suited to patient ▪ASST, thyroid stimulating hormone, Allergy etc.
Cause	I am interested in what you believe is causing your urticaria. What do you believe is causing your urticaria?	▪There is no known cause ▪Allergic immunological ▪Non-allergic immunological ▪Non-immunological	▪Theories ▪Allergens, pseudo-allergens ▪Body fluids, positive ASST; malfunctioning cells ▪Infections, psychological stress, personality
Timeline	Some patients believe that their CU is short term, others long term, some believe that their CU will come & go over time. What is your view on this?	▪CU duration statistics ▪Factors affecting duration	Taken from Chapter 1, section 1.5.1 Disease-severity, > Swelling, positive ASST+; physical urticaria
Consequences	Patients often report the consequences of CU on their lives. In what ways would you say CU has affected your life?	▪Addressed in Element 3 & action plan Dependent on type of and degree of perceived consequence/s	▪Eliciting ideas for action plan. ▪Identifying support resources/ services collaboratively with patient ▪Signposting to other professionals
Emotional Representation	Patients often report that CU can have an emotional impact on their lives. How does CU affect you?	▪Linked to negative cognitions (esp. consequences) on specific outcome	----------
Control	How do you currently control your CU symptoms?	▪Avoiding potential triggers ▪Correct use of CU medicines	▪Pseudo-allergens, stress (e.g. prioritising, planning, relaxation) ▪Taking prescribed medicines when symptomatic & asymptomatic
Necessity	How much do you believe in your medicines to control CU where 0 mean no belief & 10 total belief?"	▪How CU medicines prevent symptoms ▪How prescriptions are determined	▪Basic physiological process/ how symptoms inhibit process ▪First line anti-histamines, Second line (> dosage), Third-line
Concerns	What are your views on your CU medicines? Do you have concerns about CU medicines? Why?	▪Safety record of first-line treatments	▪History of anti-histamines, side effects of steroids ▪CU treatments and effects

Session 1 Part 2: Developing the Action Plan:

By removing misconceived cognitions participants are proposed to be in a better position to decide how to partake in fruitful self-management behaviours and this forms a CU-specific version of RA elements 6 *(goal setting and planning*) and 7 (*follow-up contact: goal strategy and review*) that is in line with BCT's for self-regulation theory (i.e. prompt specific goal setting, prompt review of behavioural goals, provide self-monitoring of behaviour, provide feedback on performance; Abraham and Mitche, 2008) defined in Table 9.4 below.

Action plans are developed to focus on issues in CU disease self-management (i.e. avoiding triggers and taking CU medicines) and findings reported from studies 1 to 5 regarding feared consequences and detrimental QoL outcomes that may require attention. The development of an action plan of behaviour change (proceeding a period of cognitive change) is non-prescriptive and a shared decision making process should occur between the researcher and patient. How elements 6 and 7 are mapped onto specific BCTs is shown in Table 9.4 below.

Table 9.4: Mapping RA Elements to Behaviour Change Techniques

RA Element	Behaviour Change Technique (BCT)
6: Goal setting & planning	(1) Prompting specific goal setting (3) Providing self-monitoring of behaviours
7: Follow-up contact: goal strategy & review	(2) Reviewing behavioural goals (3) Providing self-monitoring of behaviours (4) Providing feedback

Goal Setting and Planning (Element 6 of RA)

Firstly a clear goal is defined so that both the researcher and patient know where to target. Areas for change should have emerged from the interview. It is hoped that the patient's goal is to change their behaviour instigated by a conceptual change in their cognitive representation of CU. The participant choses a goal as this is more likely to increase their feelings of self-efficacy. It is important that behavioural goals (e.g. *I will use my anti-itch cream as advised*) and outcome goals (e.g. *to reduce itch*) are

differentiated from each other. Behavioural goals may include: Taking shower at the right temperature; reduce intake of pseudo-allergens; remember to take medicines as prescribed; confidence to visit GP when medicines stop working; do relaxation exercises to reduce stress. Outcome goals may include: To reduce itching and/ or swelling; start taking part in activities; get better nights sleep. Brainstorming was used to generate ideas between the researcher and participant and a focus here is to draw on the patient's own internal resources and social support networks.

The next step was to arrive at an actual plan. To examine the feasibility of reaching the goal the concept of SMART goals (Doran, 1981) was used to assist the patients self-monitoring of the newly proposed behaviours. SMART goals should be Specific (*clearly defined*) Measurable, Attainable (*can be reached within the confines of the patient's abilities*), Realistic (e.g. *knowledge, support networks, resources available*) and Time bound (*enough time to achieve goal*). An example of a SMART goal on the action plan worksheet created for the study is shown in Box 1 below. Participants were sign-posted to other professionals (e.g. dermatologist, GP) and NHS expert approved websites and material if concerns were outside of the researcher's professional remit.

BOX 1

SMART goal:	**I want to sleep better (outcome goal)**
Specific	I will take my last daily dosage of CU medicines at 8pm in the evening with my evening meal to allow them to continue to work before I go to bed (behavioural goal)
Measureable	I will keep a diary next to my bed and write a note of my ability to concentrate during the day and wakefulness I feel in the morning
Attainable	Yes I will keep my medicines on the dinner table as a visual reminder
Realistic:	Yes I eat my dinner at home most days at this time
Time bound:	I will try this for a month to see if this works

Follow-up Contact: Goal Strategy & Review: *(Element 7 of RA)*

The final part of the intervention entailed a follow-up phone-call where participants are asked to provide feedback on how they are managing their new behaviours. If problems occur the patient is prompted to think about how things could be changed and what barriers caused the goal not to be maintained and revisions are made. The patient continues to monitor the behaviour for the next month using the action plan. At one month the patient was contacted to provide feedback on goals achieved.

9.2.4: Measures and Materials

Participants completed the IPQ-R, BMQ, HADS, SF-36v2 and CU-Q_2oL (described in detail on from page p135) and a Participant Evaluation Questionnaire. This study-specific measure was designed as a patient self-report evaluation of the intervention. Participants agree or disagree to statements on a 5-point scale regarding: recruitment, assessments, and interviews, education, challenging perceptions, action plans, sessions and overall intervention. Higher scores indicate more positive evaluations. Participants also completed pre-study ethics documents, Copies of these, the *common sense interview* and *action plan worksheet can* be found in Appendices 4 and 5.

9.2.5: Procedure

Approximately one week before appointments participants were contacted by phone and prompted to start completing the baseline questionnaires. Approximately a week after completing the assessments participants met with the researcher for the first session. The researcher structured the session by stating the time available; the interviews informal nature and the opportunity to ask questions. At this point participants were asked to hand over their baseline assessments and the one-to one session began as detailed in Section 9.2.3 either at the clinic or in the patient's home. A week later participants were contacted by phone for the second session to feedback and review the action plan as detailed in Section 9.2.3. At the end of this session a second and third questionnaire pack was provided. One month post-intervention participants were again contacted by phone and prompted to complete and send the second questionnaire pack and at three months post-intervention participants were prompted to post the third questionnaire pack which containing the study evaluation questionnaire.

9.2.6: Data Analysis

Missing data were subjected to the Last Observation Carried Forward method (see page 263). Correlational analysis explored relationships between patient characteristics and dependent variables to determine co-variation. A one-way within groups repeated measures MANOVA (multivariate analysis of variance) determined if the outcomes combined were significant. A significant MANOVA ($p < .05$) was

followed up by a series of one-way repeated measure ANOVA's and pairwise contrasts to compare mean scores from (1) baseline to post-intervention (T1 verses T2), (2) post-intervention to follow-up (T2 verses T3) and baseline to follow-up (T1 verses T3) for each ANOVA. Bonferoni corrections were applied to reduce type one error. Participant's evaluations were reported using descriptive statistics

9.3: Results

9.3.1: Exploratory Data Analysis

Exploratory data analyses suggested the use of parametric statistical data analyses with the exception of the variables *disease duration* which was significantly skewed, *post-intervention anxiety* and *baseline CU disease-activity* which both showed significant kurtosis and *post-intervention generic mental health status* which showed both significant skew and kurtosis. Attempts to normalise the data of these variables by removing outliers and extreme scores did not improve the distribution. After a closer observation of box and whisker plots and the distribution graph for *post-intervention anxiety* together with its non-significant skew it was decided that this variable would be subjected to parametric statistical analysis. After an observation of the histogram for *post-intervention generic mental health status* it was concluded that these variable would be subjected to parametric statistical analysis. All cognitive representation variables were normally distributed.

9.3.2: Participant Characteristics

As presented in Table 9.5 the study sample consisted of 15 participants of whom the majority were White British females with a mean age of 45 years old. The majority were either married or co-habiting, had attended higher education, were in fulltime employed and had been diagnosed with idiopathic CU. All but 1 had experienced angioedema and all but two had at least one physical urticaria. Twenty-percent reported a family history of urticaria and 46.7% had other co-morbid diagnoses. The median disease duration was four years (range, 1-36 years). The majority were taking h_1 anti-histamines with other medications and had seen their GP for CU on approximately 4 occasions.

Table 9.5: Descriptive Summary of Patient Characteristics

Variable	N (15)	Percentage (%)	Statistic
Gender (%)			
Female/ Male	12/ 3	80/ 20	
Age (years) Mean ± SD/ Range	-----	-----	45.93 ± 09.85 (32 - 66)
Ethnicity (%)			
White British/ European (%)	13	73.33	
Black British/Other	2	6.67	
Education (%)			
GCSE/ O' level	3	20.00	
GCE/ A' level	3	20.00	
Higher Ed./ Degree	9	60.00	
Occupational status (%)			
Employed	12	80.00	
Not employed	3	20.00	
Not Specified			
Marital Status (%)			
Single	3	20.00	
Married/ Co-habiting	10	66.70	
Divorced	1	6.70	
Widowed/ Other	1	6.70	
Chronic urticaria			
Idiopathic	9	60.00	
Autoimmune	6	40.00	
Diagnosing specialist			
Dermatologist	13	86.67	
General Practitioner	2	13.33	
Experience Angioedema (swelling)			
Yes/ No	14/ 1	93.3/ 6.70	
Concurrent physical urticaria			
Yes/ No	13/ 2	86.70/13.00	
Other chronic illnesses			
None	8	53.3	
Underactive thyroid	2	13.33	
Diabetes	2	13.33	
Coeliac disease	1	6.67	
COPD	1	6.67	
?	1	6.67	
Age of onset (years)			
Mean/ SD/ CI / Range	15	--------	37.93 ± 14.71 (CI 95% 29.79- 46.08)
Disease duration (yrs)			
Median (range)	15	--------	4, CI, 95%, 3.09 – 14.95 (1 - 36)
GP visits in past 6 months			
Mean/ SD/ CI / Range	15	--------	2.47± 2.03 (CI 95%, 1.34- 3.59 (0 - 6)
Prescribed CU Medicines			
Anti-histamines	5	33.3	
Anti-histamines with other	10	66.7	
Family History of CU			
Yes	3	20.0	
No	12	80.0	

9.3.3: Descriptive Summary of Study Variables

Quality of Life Outcomes

Participant's baseline mean scores on QoL outcome variables are summarised in Table 9.6a below. Three-fifths percent reported experiencing a worse than average disease-specific QoL. With a mean score of 54.99 ± 25.65 this represented a moderate impact of CU on QoL. In line with these findings baseline generic mental health status scores (52.38 ± 10.99) also represented a moderate impact in just over half of the research sample. Sixty-percent scored over the scale mid-point for experiencing probable clinical anxiety with measures of central tendency indicating that the sample were more mildly rather than moderately/ severely anxious. The UAS indicated that the CU sample experienced moderate disease at baseline.

Table 9.6a: Descriptive Summary of Baseline Quality of Life Related Outcome Variables

Variable	N	Mean/ SD (CI 95%, lower- upper)	Scale Scores Percentage (%)	
			Worse than average	Better than Average
Disease-Specific Quality of Life▲	15	54.99 ± 25.65 (CI 95%, 40.79 -69.20)	60.00	40.00
General Mental Health Status▲▲	15	52.38 ± 10.99 (CI 95%, 46.29 – 58.46)	53.30	46.70
Anxiety▲▲▲	15	11.13 ± 03.56 (CI 95%: 09.16- 13.17)	60.00	40.00
Urticaria Activity Score▲▲▲▲	14	22.21 ± 12.19 (CI 95%: 15.17 – 29.26)	64.30	35.70

▲ Chronic Urticaria Quality of Life Questionnaire (CU-Q2oL): 0 – 50: Better than average, 50-100 Worse than average
▲▲ Short Form 36 item Health Survey UK Version 2 (SF-36v2)
Mental Component Summary: 0 – 50: Worse than average, 50-100 Better than average
▲▲▲ Hospital Anxiety and Depression Scale (HADS)
Anxiety subscale: Outcome 8-10 possible clinical disorder, 11-21 probable clinical disorder
▲▲▲▲ Urticaria Activity Score (UAS): 0 – 42 higher scores mean worse activity

Cognitive Representations

Participant's baseline mean scores on the cognitive representation variables are summarised in Table 9.6b below. Participants reported an average of 7 symptoms related to their CU. Just over half agreed in psychological causes and two-thirds immunity causes. For the remaining perceptions participants agreed or strongly agreed that their CU had a chronic and cyclical timeline and had serious consequences but to some degree agreed that they had some treatment control but less personal control. Almost all believed they had some knowledge of CU (scores around the scale mid-point) and all agreed that CU conjures up high emotional representations. Further, the majority believed in the necessity of taking CU medicines and a nearly the same percentage we concerned about side effects.

Table 9.6b: Descriptive Summary of Baseline Cognitive Representation Variables

Variable	N	Mean/ SD (CI 95%, lower- upper)	Scale Scores Percentage (%)	
			Strongly Agree/ Agree	Strongly Disagree/ Disagree
Illness perceptions▲				
Identity▲▲	15	7.70 ± 1.98 (CI 95%: 6.64- 8.83)	n/a	n/a
Psychological cause	15	2.60 ± 0.89 (CI 95%: 2.16- 3.16)	60.00	40.00
Immunity cause	15	2.97 ± 1.12 (CI 95%: 2.35- 3.59)	66.70	33.30
Timeline: acute/ chronic	15	3.50 ± 0.68 (CI 95%: 3.13- 3.88)	93.30	6.70
Consequences	15	3.49 ± 0.78 (CI 95%: 3.06- 3.93)	93.30	6.70
Personal control	15	2.60 ± 0.71 (CI 95%: 2.21-2.99)	60.00	40.00
Treatment control	15	2.90 ± 0.55 (CI 95%: 2.59--3.21)	80.00	20.00
Illness coherence	15	3.02 ± 1.18 (CI 95%: 2.37- 3.67)	96.67	3.33
Timeline cyclical	15	3.58 ± 0.49 (CI 95%: 3.31- 3.85)	100.00	0.0
Emotional representations	15	4.12 ± 0.81 (CI 95%: 3.67- 4.58)	100.00	0.0
Treatment Perceptions▲▲▲				
Specific necessity	15	3.66 ± 0.82 (CI 95%: 3.21- 4.12)	93.30	6.70
Specific concerns	15	3.47 ± 0.86 (CI 95%: 3.00- 3.95)	86.70	13.30

▲ IPQ-R: 0 – 50: Better than average, 50-100 Worse than average

▲▲ Identity 0 – 17 Symptom range

▲▲▲ BMQ-Specific: 0 – 50: Worse than average, 50-100 Better than average

9.3.4: Relationships between Participant Characteristics and Study Variables

Quality of Life Related Outcomes

It can be observed from Table 9.7 on page 269 that participant socio-demographic and clinical characteristics were overall unrelated to the study outcome variables. Exceptions included older age being significantly correlated to worse CU disease severity (p <.05) and marital status (i.e. being married/ co-habiting) significantly relating to post intervention and follow-up QoL (both p <.05) but not baseline reports. Most pertinent were the strong and significant negative relationships between being married or co-habiting with levels of baseline, post-intervention and post-intervention levels of anxiety (p < .01). In light of these findings, marital status was considered as a co-variant of baseline anxiety. Age was also considered as a co-variant of CU disease-severity.

Cognitive Representations

Cognitive representations were also unrelated to participant characteristics (table not shown) with exception to perceptions of serious consequences positively correlating with age at onset (r = .74, p <.05), having co-morbidity (r = .60, p <.01), less disease duration (r = -.56, p <.05) and being employed (r = .53, p <.05), personal control which negatively correlated with age (r = -.67, p <.01) and specific concern beliefs with age of onset (r = .54, p <.05). These participant characteristics were treated as possible co-variates of the cognitive representation ANOVA's undertaken later in the chapter.

Table 9.7: Relationships between Patient Characteristics and QoL Related Outcome

	Baseline QoL♦	Post-Intervention QoL	Follow-up QoL	Baseline GMHS▲	Post-Intervention GMHS	Follow-up GMHS	Baseline Anxiety	Post-Intervention Anxiety	Follow-up Anxiety	Baseline UAS►
Gender*	.466	.313	.267	-.064	.091	.110	.151	.166	.205	.394
Age*	.105	.222	.082	.127	.272	.324	.067	.034	-.069	***.610**
Ethnicity◦	.138	.149	.092	-.234	.067	.182	.471	.437	.390	.288
Education◦	-.236	-.268	-.384	.171	.208	.279	.041	.204	.122	-.188
Occupation◦	-.088	-.199	-.086	.308	.045	-.023	-.371	-.389	-.310	-.298
Marital status◦	-.416	***-.561**	***-.596**	.501	.325	.390	****-.663**	****-.673**	****-.704**	-.225
CU diagnosis◦	.170	.023	.263	-.074	-.210	-.308	.186	.161	.324	-.218
CU subtype◦	.375	.502	***.559**	-.158	-.141	-.289	.032	.000	.036	.007
Angioedema◦	.074	.297	.089	.205	.058	.087	.234	.191	.071	.098
Physical urticaria◦	.064	.117	.106	.343	.150	-.005	-.300	-.313	-.316	.005
Age at onset◦	.282	.374	.227	.037	.123	.153	.008	.041	-.085	.374
CU Medicines◦	.370	.259	.245	.068	.045	.180	.286	.300	.246	.483
Co-morbidity◦	-.235	-.225	-.203	-.024	-.026	-.061	.103	.204	.241	-.272
Disease duration▪	.027	-.061	.086	-.110	.054	-.169	.238	.127	.233	.019

◦Pearson's r, ▪Spearman's rho Significance: *$p < .05$, **$p < .01$, ***$p < .001$ ♦QoL: Quality of Life ▲ GMHS: Generic mental health status ►

9.3.5: Effect of Intervention on Combined Quality of Life Related Outcomes

The first analyses examined the effect of the intervention on the combined study outcome variables of disease-specific quality of life (DSQoL), generic mental health status (GMHS) and levels of anxiety from baseline, post-intervention and 3 months follow-up via a one way repeated measure MANOVA. Using Pillia's Trace as the test statistic the MANOVA indicated a strong significant within-subjects main effect for the intervention on the combined CU-specific outcome scores (V= .88, F (6, 9) = 11.23, p < .001). This strong significant effect was also supported by alternative test statistics (Wilks' Lambada, Hotelling's Trace and Roy's Largest Root), which produced the same multivariate results (all p < .001) with a partial eta square of .88 and observed power statistic of 1.00. As the MANOVA was strongly significant a series of one-way univariate repeated measure ANOVA's were undertaken to establish which outcomes were significant. These are reported in the sections below.

9.3.6: Intervention on Disease-Specific Quality of Life

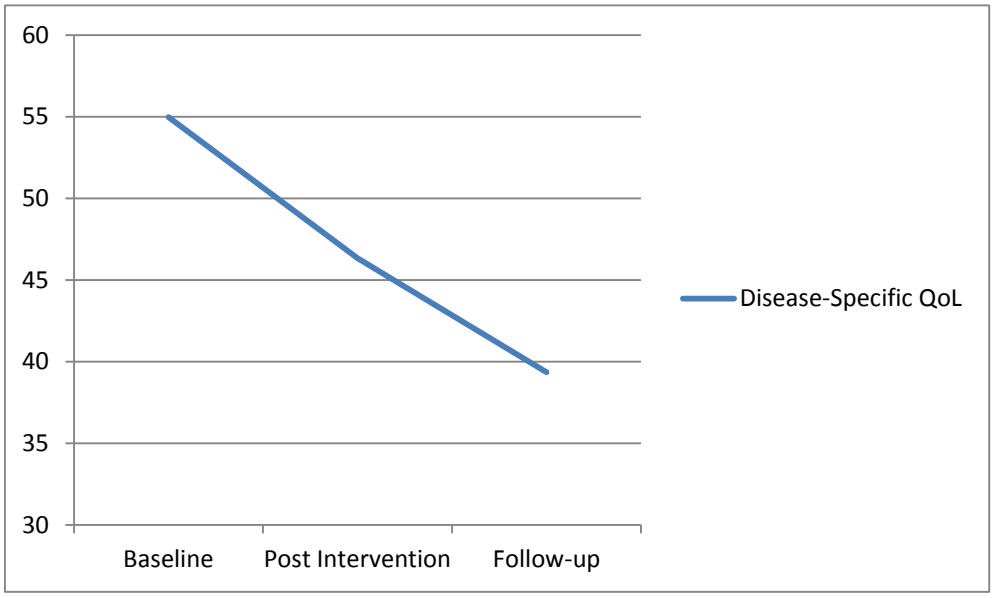
With higher scores indicating worse disease-specific QoL outcome participant's scores decreased from baseline to post-intervention and again from post-intervention to follow-up indicating incremental improvements in CU-related QoL over time (see Table 9.8 below and Figure 9.2, p271).

Table 9:8: Effect of Intervention on Disease-Specific Quality of Life

Variable	**Baseline (T1)** (Mean SD)	**Post Intervention (T2)** Mean (SD)	**3 Months Follow-up (T3)** Mean (SD)
	(n= 15)	(n= 15)	(n= 15)
Disease-Specific▲ Quality of Life	54.99 ± 25.65*	46.33 ± 25.24	39.36 ± 25.94

▲ Chronic Urticaria Quality of Life Questionnaire (CU-Q^2oL): 0 – 50: Better than average, 50-100 Worse than average

Figure 9.2: Graph to show changes in Disease-Specific QoL scores over the Study▲



▲Chronic Urticaria Quality of Life Questionnaire (CU-Q2oL): 0 – 50: Better than average, 50-100 Worse than average

To establish the effect of the intervention on disease-specific QoL a repeated measures ANOVA of mean scores (with sphericity assumed: X^2 (2)= 3.44, p >.05) was undertaken. The ANOVA established a strong significant within-groups main effect found for timeline (F 2, 28)= 16.22, p <. 001). With a partial eta square of η^2 = .54 and an observed power of 1.00, this indicated that DSQoL explained some of the variance not explained by generic mental health status (GMHS) or anxiety. Pairwise contrasts confirmed a significant mean difference between T1 verses T2 (p= .04) and even stronger significant mean differences between T2 verses T3 (p = .01) and T1 verses T3 (p = .01).

9.3.7: Intervention on Generic Mental Health Status

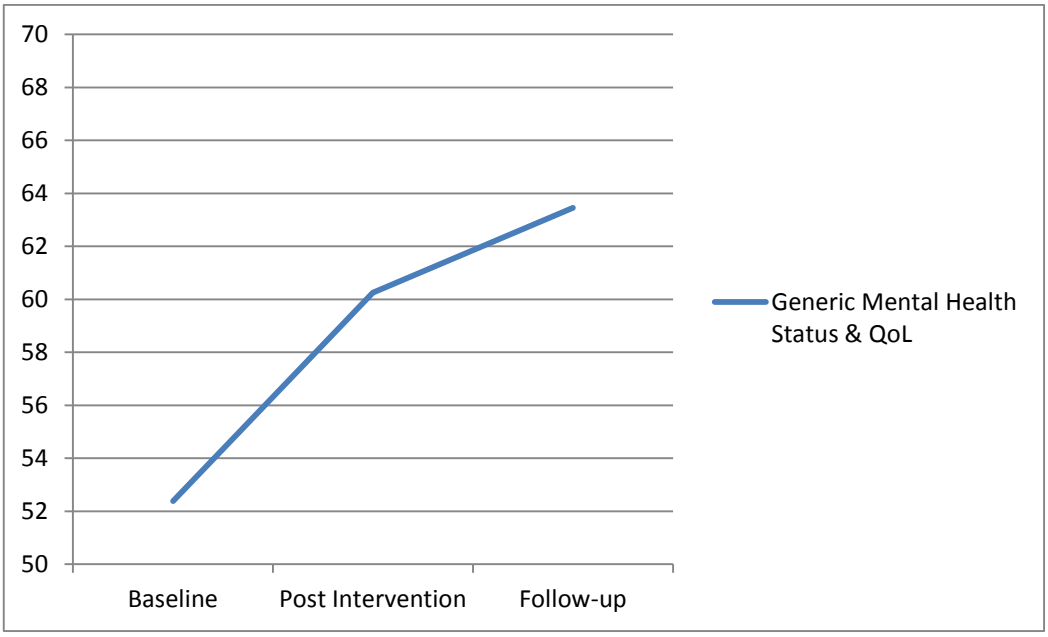
With higher scores indicating better reports of Generic Mental Health Status and QoL Participants' mean scores suggested that CU outcome had improved over the course of the study (see Table 9.9 p272). This pattern is graphically presented in Figure 9.3 (p272) and confirms this pattern from baseline to post-intervention and follow-up.

Table 9:9: Effect of Intervention on Generic Mental Health Status

Variable	Baseline (Mean SD) (n= 15)	Post Intervention Mean (SD) (n= 15)	3 Months Follow-up Mean (SD) (n= 15)
Generic mental health status	52.38 ± 10.99	60. 25 ± 9.67	63.45 ± 10.70

▲Short Form 36 item Health Survey UK Version 2 (SF-36v2) Mental Component Summary score: 0 – 50: Worse than average, 50-100 Better than average

Figure 9.3: Graph to show changes in Generic Mental Health Status Scores over the Study▲



▲Short Form 36 item Health Survey UK Version 2 (SF-36v2) MCS score: 0 – 50: Worse than average, 50-100 Better than average

With sphericity not assumed (X^2 (2) = 14.13, p = .001; ε .60) a repeated measure ANOVA of GMHS was undertaken using the Greenhouse Geisser statistic. The ANOVA established a strong significant within-groups main effect found for timeline (F 2, 16.84) = 18.47, p < .001). With a partial eta square of η^2 = .57 and an observed power of 0.99 this indicated that GMHS explained some of the variance not explained by the other outcome factors. Pairwise contrasts taken for GMHS confirmed strong significant mean differences overall between T1 verses T2 (p =. 01), T2 verses T3 (p = .01) and T1 verses T3 (p =.01).

9.3.8: Intervention on Anxiety

The mean scores for anxiety at baseline, post-intervention and follow-up are presented in Table 9.10 below. With higher scores indicating worse levels of anxiety, the scores suggested that reports of this CU outcome had improved at post-intervention from baseline with marginal improvements at 3 months follow-up. These results are also presented graphically in Figure 9.4 (p274).

Table 9:10: Effect of Intervention on Anxiety

Variable	Baseline (Mean SD) (n= 15)	Post Intervention Mean (SD) (n= 15)	3 Months Follow-up Mean (SD) (n= 15)
Anxiety	11.13 ± 3.56	9.67 ± 2.94	9.47 ± 3.09

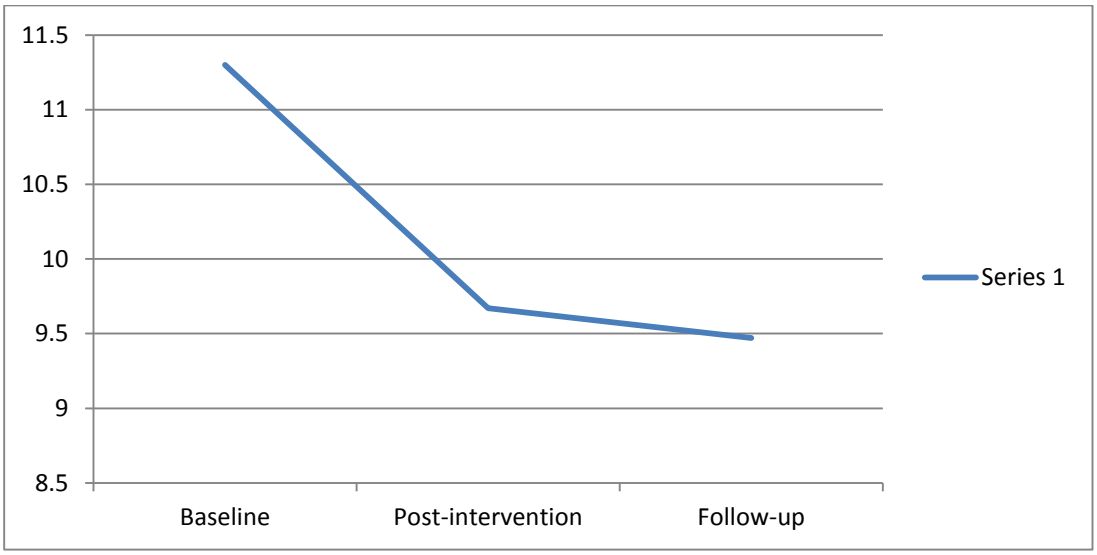
▲ Hospital Anxiety and Depression Scale (HADS) Anxiety subscale: Outcome 8-10 possible clinical disorder, 11-21 probable clinical disorder

With sphericity not assumed (X^2 (2) = 6.08, p <.05; ε .73) a repeated measure ANOVA of anxiety undertaken using the Greenhouse Geisserr statistic established a strong significant within-group main effect found for timeline (F (2, 20.39) = 31.18, p < .001). With a partial eta square of η^2 =.69 and an observed power of 1.00 this indicated that anxiety explained some of the variance not explained by the other outcome factors. Pairwise contrasts of mean scores for levels of anxiety (with Bonferoni corrections applied) confirmed strong significant mean differences overall between T1 verses T2 (p = .001) and T1 verses T3 (p = .01) but mean differences between T2 verses T3 was insignificant (p >.05).

Effect of intervention on anxiety controlling for marital status:

In section 9.3.4 correlations undertaken between participant characteristics and the outcome variables found a strong significant relationship between marital status (i.e. being married or co-habiting) and lesser levels of anxiety at baseline, post-intervention and follow-up. In order to examine marital status as a possible confounding factor of the study manipulation (i.e. changing cognitive representations) the anxiety ANOVA was undertaken again as a repeated measures analysis of co-variance (ANCOVA) with marital status as the moderating co-variate. Using Pillai's Trace as the

Figure 9.4: Graph to show changes in Anxiety over the Study▲



▲▲Hospital Anxiety and Depression Scale (HADS) Anxiety subscale: Outcome 8-10 possible clinical disorder, 11-21 probable clinical disorder

multivariate test statistic a strong significant within-groups effect for changes in anxiety scores over the course of the study was found as it did in the original analysis (V= .67, *F* (2, 12.38)= 12.39, *p* < .001; η = .67; observed power .98) however there was no significant interaction between marital status and anxiety over time (V= .23, *F* (2, 12)= 1.74, *p* > .05; η =23; observed power .29). More specifically changing cognitions and actions to reduce anxiety scores was independent of the impact of any moderating affects of marital status over time. With sphericity not assumed (X^2 (2) = 6.41, *p* = .04) univariate findings using the Greenhouse-Geisser statistic confirmed this main effect on anxiety (*F* (1.41, 18.39)= 20.61, *p* = .001; η = .61; 1.00) and the non-significant interaction effect with marital status (*F* (1.41)= 1.28, *p* > .05; η = .09; .21). However, when both ANOVA and ANCOVA analyses are compared the impact of marital status resulted in a reduced *F* ratio and a much reduced significance level for effects on anxiety over time (*F* (2, 20.39) = 31.18, *p* < .001 for ANOVA verses (*F* (1.41, 18.39)= 20.61, *p* = .001 for ANCOVA). In line with the original analyses within subject contrasts indicated a strongly significant difference between mean scores for anxiety from baseline to post-intervention (*F* (1, 13)= 26.75, *p* < .001) but not from post-intervention to follow-up.

9.3.9: Effect of Intervention on Cognitive Representation Components

The first analyses examined the effect of the intervention on the combined cognitive

representation variables from baseline, post-intervention and 3 months follow-up. Multivariate test statistics could not be produced due to insufficient residual degrees of freedom but as no groups were involved here the within-groups effect results were observed. Using Greenhouse-Geissar corrected estimates of sphericity not assumed the MANOVA indicated a strong significant within-subjects main effect for the intervention on the combined CU-specific outcomes (F (6.49, 90.84) = 16.76, p < .001). This strong significant effect was also supported by the alternative Huynh-Feld statistic (p < .001, partial eta square .55, observed power 1.00). As the MANOVA was strongly significant a series of one-way univariate repeated measure ANOVA's (with Bonferoni corrections applied) were undertaken to establish which relationships were significant. The findings of changes in cognitive representations over time are presented in Table 9.11a (p276)

An initial observation of Table 9.11a (p276) indicated improvements on each component from baseline to post-intervention (T1-T2), and from baseline to follow-up (T1- T3) with exception to immunity cause, but little improvement (but maintained scores) from post-intervention to 3-month follow-up (T2-T3). Univariate analyses of the representation models indicated strong and significant improvements for all components (p <.001) with the exception of psychological cause and treatment control which both showed a tendency towards significance.

Pairwise comparisons (see Table 9.11b, p277) confirmed that the strongest improvements from T1 maintained to T3 were for lesser serious consequence and emotional representations perceptions (p < .001) followed by perceptions of more personal control, lesser timeline cyclical beliefs and greater specific necessity beliefs. Further participants reported lower symptoms attributions (illness identity), a reduction in chronicity beliefs and increased illness coherence (understanding CU; p < .05).

Table 9:11a: Effect of Intervention on Cognitive Representation Components

Variable	Baseline (T1) (Mean SD) (n= 15)	Post Intervention (T2) (Mean SD) (n= 15)	3 Months (T3) (Mean SD) (n= 15)	Sphericity	ANOVA (F)	Sig. *P Value*	Partial η^2	Power
Identity	7.73 ± 1.98	3.93 ± 1.53	3.67 ± 1.35	X^2 (2)= 30.44, p < .05	(F 1.05, 14.71)= 36.99	<. 000	.73	1.00
Psychological cause	2.67 ± 0.90	3.11 ± 0.78	3.13 ± 0.77	X^2 (2)= 07.07, p < .05	(F 1.41, 19.73)= 30.55	= .060	.20	0.51
Immunity cause	2.97 ± 1.12	3.01 ± 0.98	3.20 ± 0.98	X^2 (2)= 13.37, p < .05	(F 1.23, 17.05)= 00.44	>.05	.03	0.10
Timeline: acute/ chronic	3.50 ± 0.68	3.07 ± 0.73	2.89 ± 0.73	X^2 (2)= 3.10, p > .05	(F 2, 28)= 08.64	<. 000	.38	0.95
Consequences	3.50 ± 0.78	2.87 ± 0.71	2.57 ± 0.71	X^2 (2)= 1.38, p > .05	(F 2, 28)= 34.42	<. 000	.71	1.00
Personal control	2.60 ± 0.71	3.36 ± 0.82	3.56 ± 0.82	X^2 (2)= 0.90, p >.05	(F 2, 28)= 19.64	<. 000	.58	1.00
Treatment control	2.90 ± 0.55	3.43 ± 0.64	3.44 ± 0.64	X^2 (2)= 0.39, p >.05	(F 2, 28)= 02.98	= .070	.18	0.53
Illness coherence	3.02 ± 1.77	3.94 ± 0.72	4.14 ± 0.72	X^2 (2)= 6.59, p < .05	(F 1.43, 20.03)= 11.07	<. 000	.44	0.98
Timeline cyclical	3.80 ± 0.49	3.17 ± 0.65	3.17 ± 0.65	X^2 (2)= 0.96, p >.05	(F 2, 28)= 11.35	<. 000	.45	0.99
Emotional representation	4.12 ± 0.81	3.24 ± 0.49	3.04 ± 0.49	X^2 (2)= 07.9, p < .05	(F 1.38, 19.25)= 31.60	<. 000	.69	1.00
Specific necessity	3.66 ± 0.82	4.17 ± 0.63	4.20 ± 0.63	X^2 (2)= 1.06, p >.05	(F 2, 28)= 10.24	<. 000	.42	0.98
Specific concerns	3.47 ± 0.86	2.92 ± 0.44	2.54 ± 0.42	X^2 (2)= 6.15, p < .05	(F 1.5, 20.3)= 13.32	<. 000	.49	0.99

*Scale: 1 strongly disagree – 5 strongly agree (scores spiit at scale mid-point 0-2.4= strongly disagree/ disagree, 2.5-5 strongly agree/ agree

Table 9:11b: Pairwise Comparisons of Intervention over Time

Representation	Baseline - Post-intervention (T1 to T2) Mean difference	Post-intervention - 3 Months (T2 to T3) Mean difference	Baseline - 3 Months (T1 to T3) Mean difference
Identity	*3.80	0.27	*4.07
Psychological cause	n/a	n/a	n/a
Immunity cause	n/a	n/a	n/a
Timeline: acute/ chronic	*.43	1.73	**.60
Consequences	***.62	*.30	***.93
Personal control	**-.77	-.19	***-.96
Treatment control	n/a	n/a	n/a
Illness coherence	*-.92	-.21	-.1.12
Timeline cyclical	**.41	-.01	**.41
Emotional representation	***.88	.19	***1.08
Specific necessity	**-.51	-.03	**-.55
Specific concerns	*.55	*.38	**.93

*$p < .05$ **$p < .01$ ***$p < .000$

9.3.10: Correlations between Change Scores in Cognitions and QoL Outcomes over Time

As the control group had been eliminated from the study due to attrition, it was still difficult to infer that the significant changes in QoL outcomes overtime were due to addressing cognitive representations in the intervention. In order to infer this to some degree changes in cognitive representation components at three time-points (T1-T2, T1-T3 and T2-T3) were correlated with changes in QoL outcomes at the same respective time-points. Guidelines for using simple change scores in correlational analyses by Gardner and Neufeld (1987) for correlating one variable change score with another was used. Scores for all variables where first transformed to a change score by subtracting T2 from T1, T3 from T1 and T3 from T2 before correlations were undertaken using Pearson's *r*. The results can be found in Table 9.12 (p 278).

Anxiety

Correlations between anxiety and cognitive change scores found a significant relationship between anxiety and identity change from baseline to post-intervention (T1-T2; $p < .05$) and this relationship was stronger between baseline to 3-month follow-up (T1-T3; $p < .01$). Another significant

Table 9.12: Correlations between Cognitive and QoL Outcome Change over Time

	Residual Change Correlation Coefficient to QoL Outcome (*r*)					
	Baseline – Post intervention (T1–T2)		Post-Intervention – Follow-up (T2 – T3)		Baseline – Follow-up (T1 – T3)	
	Mean Change	*r*	Mean Change	*r*	Mean Change	*r*
Anxiety Change						
Identity	-3.80	***-.437**	-.27		-4.07	****-.548**
Psychological Cause	.45		.02		.47	▲*.402*
Immunity Cause	.04		.18	***-.510**	.23	
Consequences	-.62		-.30		-.92	▲*-.351*
Timeline Cyclical	-.41	▲*-.352*	-.16		-.41	
Coherence	.92		.21	▲*.380*	1.12	▲*.399*
Emotional Representation	-.88		-.20	***.458**	-1.08	
Specific Necessity	.51	***.454**	.03	****.627**	.55	
Specific Concerns	-.55		-.38	***.515**	-.93	
Mental Health Status						
Immunity Cause	.04		.18	***.488**	.23	▲*.389*
Consequences	-.62	▲*-.382*	-.30		-.92	
Timeline Cyclical	-.41		-.21		-.41	▲*-.613*
Emotional Representation	-.88	****-.608**	-.20		-1.08	
Specific Necessity	.51		.03		.55	▲*.361*
Quality of Life						
Immunity cause	.04	****.662**	.18	***-.483**	.23	
Consequences	-.62	.	-.30		-.92	***.503**
Personal Control	.76		.20		.96	***451**
Emotional Representations	-.88		-.20	***.429**	-1.08	
Specific Necessity	.51		.03	****.559**	.55	
Specific Concerns	-.55		-.38	****.640**	-.93	

*$p < .05$ **$p < .01$ ▲Trend ($p = .06$) Note: Only significant and trend correlations included in table

correlation was found at T1-T2 for anxiety and specific necessity change scores ($P < .05$) and this relationship strengthened further between T2-T3 ($p < .01$). The most significant correlations with anxiety and cognitive change scores were found between post-intervention to 3-month follow-up (T2-T3) for immunity causes, emotional representations and specific concerns (all $p < .05$). Finally a number of relationships that were not significant but deemed worthy of reporting consisted of change score relationships trends between anxiety and timeline cyclical at T1-T2, psychological cause and consequences at T1-T3 and illness coherence at both T2-T3 and T1-T3 (all $p = .06$).

Generic Mental Health Status

Correlations between generic mental health status (GMHS) and cognitive change scores found a significant relationship with emotional representations at T1-T2 (p <.01). This was also found for GMHS and immunity cause between T2-T3 (p < .05) but this relationship was just short of significance at T1-T3 (p = .06). Further notable trends were found between GMHS change scores and change scores for timeline cyclical and specific necessity at T1-T3 (p = .06).

Disease-Specific Quality of Life

Significant relationships were found for disease-specific quality of life (DSQoL) and cognitive change scores. A strong and significant relationship was found between DSQoL change and immunity cause change at T1-T2 (p < .01) and to a lesser extent at T2-T3 (p <.05). Another significant relationship was found between DSQoL and emotional representations at T2-T3 (p <.05), but this was stronger for both specific necessity and concerns at the same time-point (both p <.01). Further significant changes scores were found for DSQoL change with consequences and personal control between T1-T3 (p < .05).

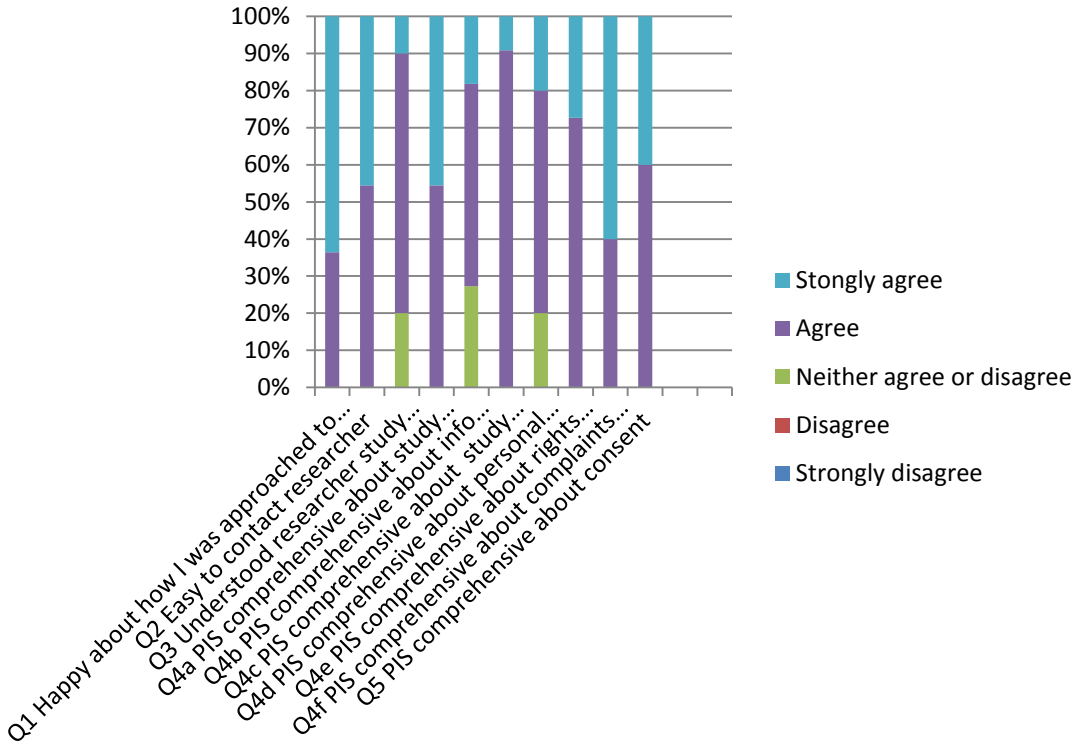
9.3.11: Participant Study Process Evaluation

The final set of analyses evaluated the participant's experience of the study process in terms of: (1) recruitment; (2) assessments; (3) education and challenging perceptions; (4) action plans and (5) overall Intervention. Data was available from nine of the fifteen respondents (60%).

Recruitment process

The majority of participant's agreed that the recruitment process (illustrated in Figure 9.5a; p280) was positive in all aspects, strongly agreeing with how they were approached, contacting the researcher, the comprehensibility of the study purpose, complaints procedure and informed consent (questions 1-5). However a fifth were ambivalent about the researchers' explanation of the study and/or how personal data would be handled and about a quarter were ambivalent about how information could be sort outside the PIS (participant information sheet).

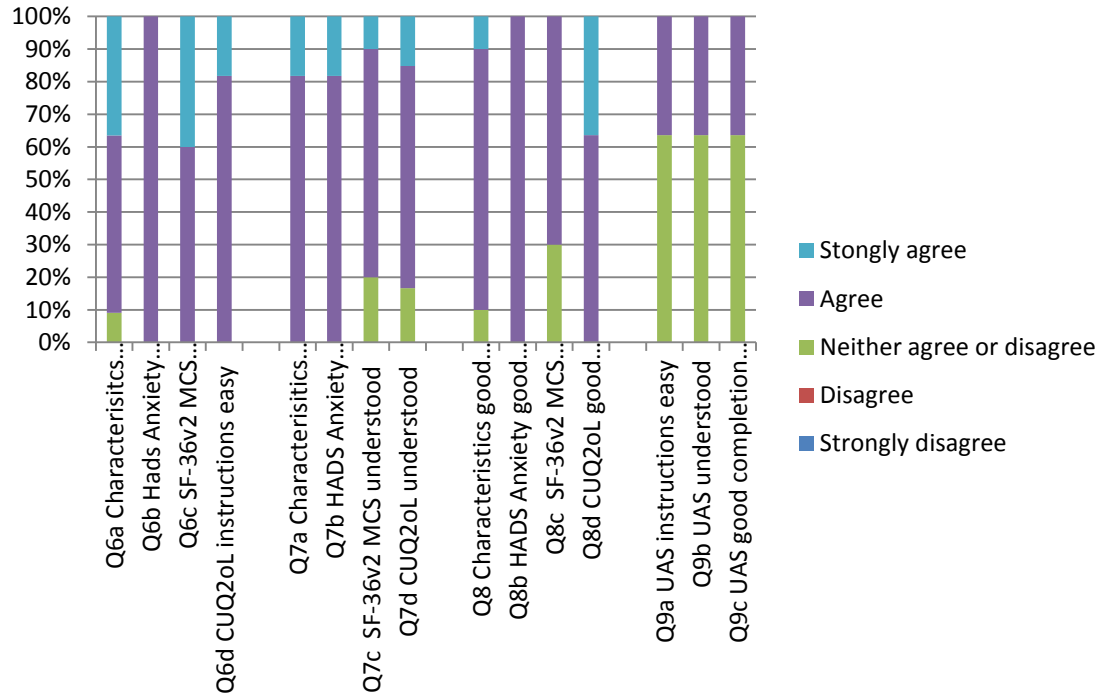
Figure 9.5a: Participant Recruitment Process Evaluation



Assessments: Questionnaires

The second set of questions (6-9) concerned the participant's experience completing the studies assessments. The findings are presented in Figure 9.5b

Figure 9.5b: Participant Evaluation of Questionnaires and Urticaria Activity Score

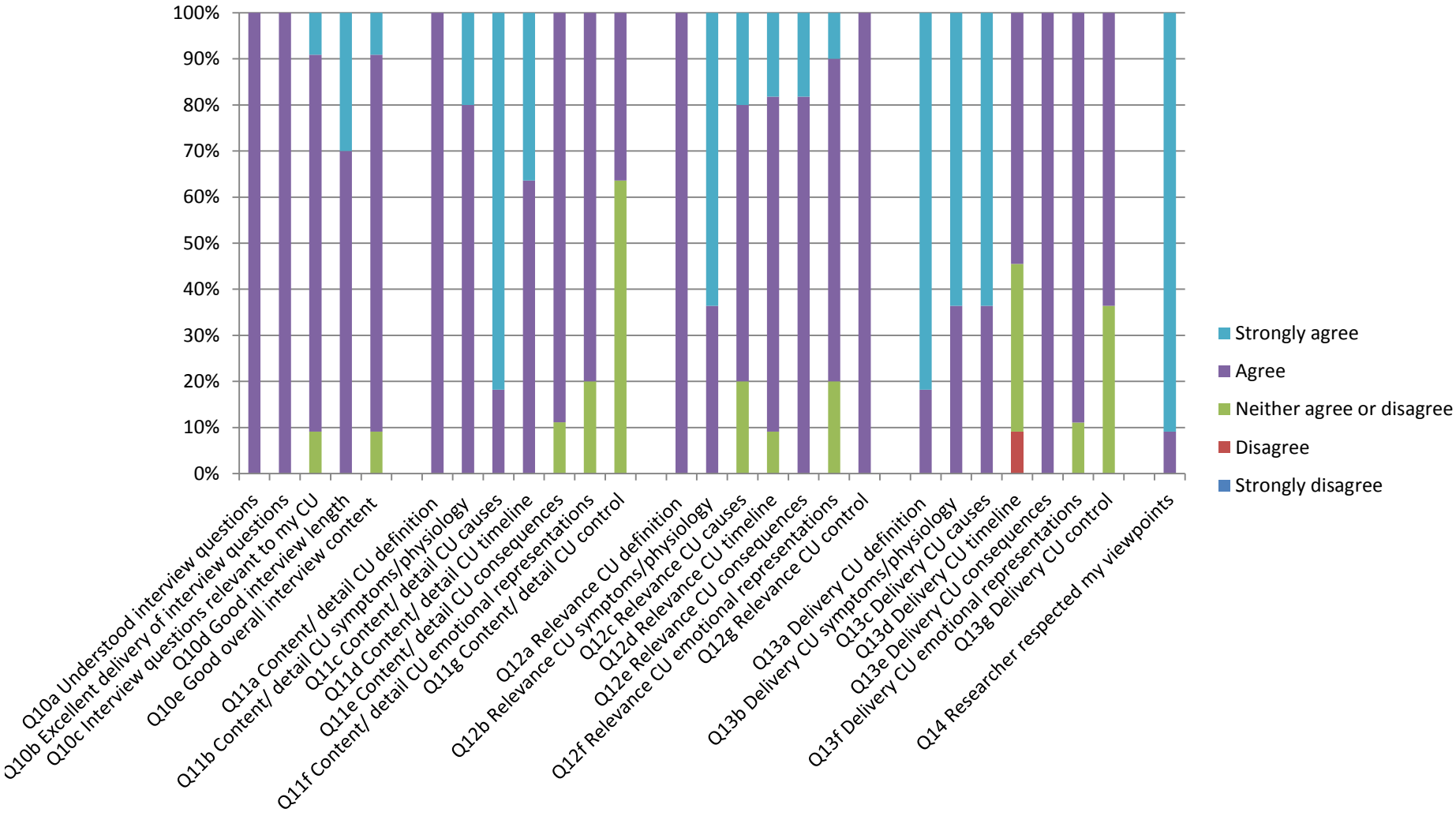


It can be observed from Figure 9.5b that the majority agreed that the questionnaires were easy to use in terms of the instructions, understanding the items and the times taken to complete them. However, just over 60.0% could not decide on these aspects in regard to the UAS.

Psycho-Education and Challenging Perceptions

The third set of questions (10-14) concerned the participant's experience of the actual intervention. As shown in Figure 9.5c on page p282 all participants agreed that they understood the research questions and were excellently delivered by the researcher. In respect to the psycho-educational material the majority of the sample agreed that the delivery, contents, relevance to their own CU was excellent but as can be observed in Figure 9.5c (p282) there were areas of concern. Although only 10% could not decide if the interview questions were relevant to their CU or the quality of the interview content, a fifth were undecided about the content of the emotional representations material and this extended to its relevance for 20.0% and delivery or just over 10.0%. Further just over 60.0% were undecided about the control content of the material and 36.4% its delivery but despite this the entire sample believed the control material was relevant to CU management. Regardless, the majority of reported (90.1%) agreeing that the researcher always respected their viewpoint on their CU experiences and the remaining strongly agreed.

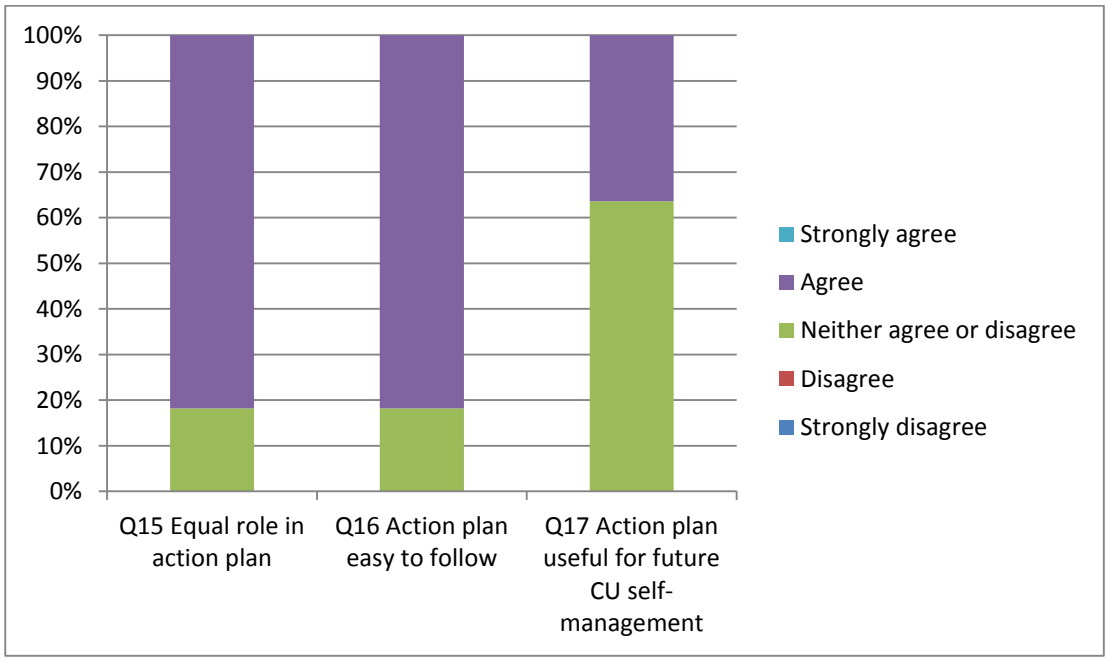
Figure 9.5c: Participant Evaluation of Psycho-Education and Challenging Perceptions



Action Plans

The next questions (15-17) concerned the participant's experience of undertaking the action plan with the researcher. Even though the majority of participants believed that they had an equal role in developing their action plan and that it was easy to follow (both 81.8%), it can be seen from Figure 9.5d below that nearly two-thirds of the sample were undecided as to whether it would be useful for their future CU self-management.

Figure 9.5d: Participant Evaluation of Action Plans

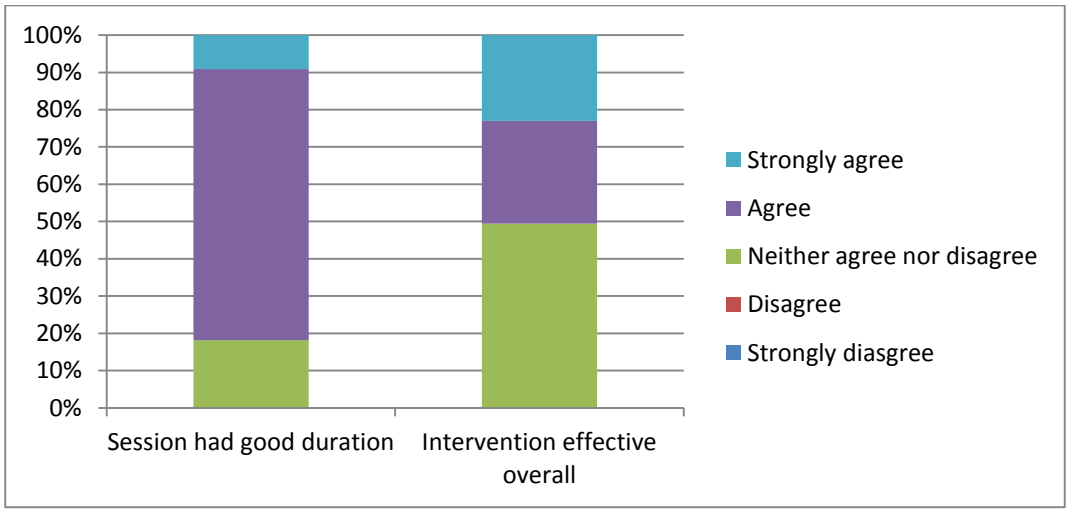


Sessions

Questions 18-19 asked participants how they found the length of time allocated for the intervention (this ranged from approximately 45 minutes to 90 minutes depending on the participants level of understanding and needs) and the rating of the intervention session overall. The findings are presented in Figure 9.5e (p284).

A considerable 72.7% agreed that their session was of a good duration and nearly 10% strongly agreed but almost a fifth were undecided as to whether the timing of their session was long enough. In respect to its overall efficacy of the sample were divided as to agreeing

Figure 9.5e: Participant Evaluation of Sessions

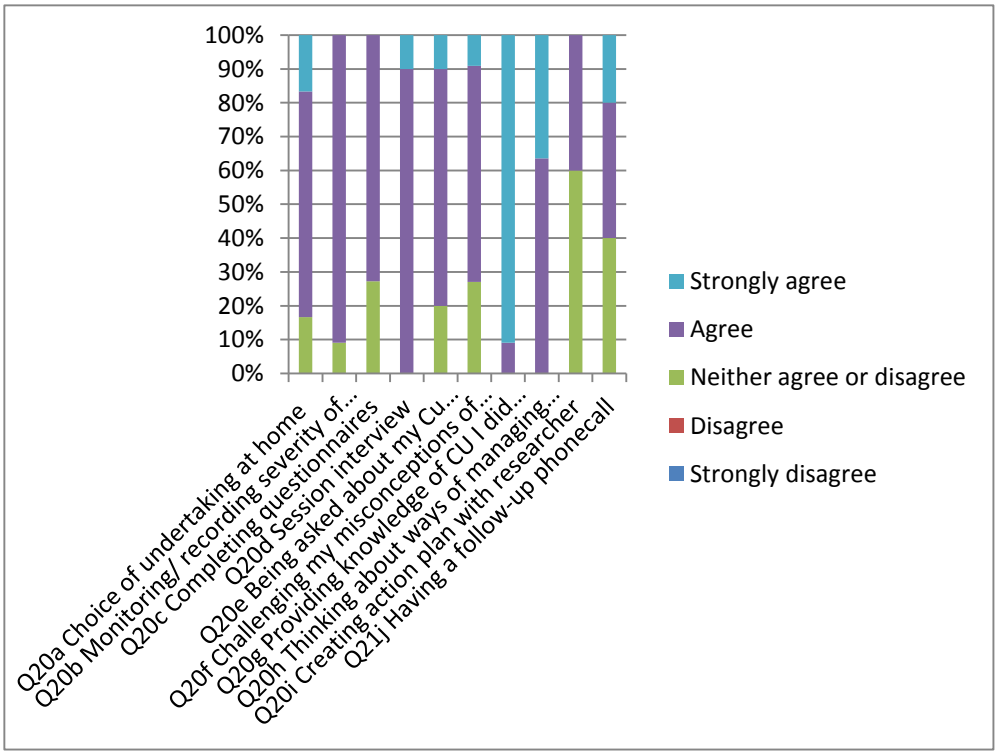


(or strongly agreeing) that the intervention was efficious and being unsure about this. Despite this finding no participant disagreed or strongly disagreed as the ineffective of the intervention.

Most useful aspects of Intervention

The final question (20) asked the study participants what they believed to be the most important aspect of the intervention. The results are presented in figure 9.5f below.

Figure 9.5f: Most useful Aspects of Intervention



An observation of Figure 9.5f (p284) indicates that the research sample as a whole agreed that all aspects of the intervention where beneficial to some degree particularly the session interviews and in self-monitoring ones itching and swelling. More so 90.1% strongly agreed that the core aspect of the intervention (providing knowledge about CU not previously known or understood) was the most beneficial. No area was seen as irrelevant but a substantial proportion of the sample was overall undecided as to how beneficial the developing of the action plan was collaboratively with the researcher or the follow-up phone-call.

9.4: Discussion

The aim of this study was to test the feasibility of a brief intervention designed to change CU-related QoL outcomes by changing representations of CU. The second aim was to determine whether CU representations itself was amenable to change and if both changes would persist over time. This study provided evidence to support both and was overall acceptable and beneficial to participants experiencing moderate CU. The findings are discussed further below.

Cognitive representations of CU are amenable to change via intervention

The first major finding was that cognitive representations of CU were amenable to change via intervention. Strong and significant changes in most representational components were found from baseline to 4-weeks post-intervention (T1- T2). However there were minimal changes from post-intervention to 3-months follow-up (T2-T3) but the similar scores between these time-points indicated that initial improvements in represents about CU in the predicted directions didn't improve further or decline, but were maintained overtime (hence the strong significant differences from baseline to 3 months). Such findings are in line with the changing illness perceptions research literature reviewed in chapter 2 that such brief interventions can have a strong impact on how individuals see their condition (e.g. Petrie et al, 2002; Broadbent et al, 2002). It also supports the need for CSM based interventions in CU discussed in Study 4 (section 7.4). The implications of these findings are further discussed later in the chapter.

One concern was that although cognitive representations of CU were improved and maintained over time, both causal attributions and treatment control perceptions did not significantly change over time. Why this is the case is difficult to determine. Psychological and immunity causes were included in this study as they dominated in Study 4 over risk and accident/ chance causes. For immunity causes a possible explanation is that participants already understood the immunity origins of CU before the intervention. This information usually comes from the patients' dermatologist during the diagnostic process when deciphering between whether patients have idiopathic or autoimmune urticaria (Zuberbier et al, 2009, 2012). Further in qualitative study 5 all participants reported CU in an immunological context. However scores for psychological causes and treatment control from T1 to T2 were reaching significance with increasing beliefs in psychological causes and better treatment control at time T1 to T2 (*p= .06 and .07*) hence maybe the sample size was too small to reach a potential significant effect or the psycho-educational material was not detailed or clear enough.

An intervention Designed to Change Representations of CU results in better CU Outcome

Even though it was easier to assume that changes in cognitive representations were as a result of directly targeting cognitive representations in the intervention, the elimination of the control group made drawing this conclusion to QoL-related outcomes more difficult to conclude despite the positive findings of the multivariate analyses undertaken. To infer to a degree that changes in QoL outcomes were a result of challenging cognitions in the intervention, correlations between cognitive change scores and QoL outcome change scores over time were correlated. These analyses confirmed the second major finding that a brief intervention designed to change perceptions of CU can result in better self-reported disease-specific QoL, better generic mental health status and reduced anxiety levels that persist over time. Not all cognitive changes over time significantly related to changes in all QoL outcomes, however this was expected as not all CU cognitive representations are related to all outcomes (hence some cognitions are more

important to particular outcomes than others). The importance here was that all components played a part in some aspect of QoL outcomes and it can be deciphered as to which cognitive components where the most important for targeting particular outcomes that persist over time. Examples in this study included challenging illness identity to reduce the number of symptoms attributed to ones CU to reduce anxiety and increasing necessity beliefs about taking CU medicines while reducing concerns about taking them to improve CU disease-specific QoL.

Not all significant change score relationships occurred from baseline to post-intervention to 3-month follow-up but only between 4-week post-intervention and 3-month follow-up (T2 to T3). An example included emotional representations, specific necessity and specific concern change on DSQoL change. It is suggested that maybe not all psycho-educational material gets assimilated straight away but may take up to a month to be accommodated before persisting at 3-months. In respect to challenging necessity and concern beliefs about taking CU medicines to improve DSQoL this would make sense as positive changes in CU medicine uptake behaviour resulting from a change in CU treatment beliefs may take more time to learn before mastering.

In contrast emotional representations and GMHS change scores only persisted from baseline to 4-weeks post-intervention before becoming insignificant at 3-month follow-up. The emotional impact of CU is a topic that those experiencing CU often report as neglected by health professionals (Maurer et al. 2011) and maybe the intervention fell short by only merely raising awareness of the emotional impact of CU. This may have resulted in participants feeling better mentally about the emotional impact of CU being acknowledged, but it might have needed more than educational awareness alone to maintain this effect over time by incorporating action plans for emotions as standard (not an option). For example Cameron and Jago (2008) who focus their research predominantly on the emotional aspects of the CSM have used writing exercises that propose to help by getting ones feelings onto paper before then externalising them. However, in

patients with years of unaddressed emotional distress it may require more than a belief psycho-educational intervention (as the one in this study) to implement such strategies to be beneficial. This would further explain the insignificance at 3-month follow-up.

One aspect that could not be dismissed was the numerous trends found between change scores over time that just fell short of a significant result (p =.06). It would have been easy to eliminate these correlations statistically as if they were significant they would have been weakly so. However it was felt that these trends had to be interpreted within the context of the small sample size of this study and that they mostly occurred between baseline and 3-month follow-up scores (T1-T3). From these observations it is more likely that the study just required a considerably larger sample size to reach significance for these relationships. This interpretation is also more credible as these trends made conceptual sense (e.g. change correlations between perceiving less serious consequences of CU and reporting lower levels of anxiety).

Overall the findings indicate that a greater knowledge and understanding of one's CU as an illness may play a role in how the condition is maintained and experienced over time. Such findings are in line with previous studies that have not necessarily aimed to change QoL outcomes but have challenged patient's perceptions of their illness to change variables other than just merely the representations itself. For example Petrie et al, (2002) found that changing illness perceptions improved functional outcomes such as returning to work and attending rehabilitation after myocardial infarction. In the context of QoL outcomes itself, it was highlighted in chapter 2 (see Table 2.1, p38) that much of the research specifically on representations of illness and QoL has been cross-sectional and of the longitudinal studies undertaken (Chaboyer et al, 2010; Stafford et al, 2009; Llwellyn et al. 2007a) only the natural course of representations over time on QoL has been examined. This study not only supports cognitive representations as psychological process factors on CU but also as mechanisms of change of CU-related QoL

outcome. These implications are discussed below.

CU is implicated in Socio-Cognitive Processes and Mechanisms of Change

The ability of this study to change cognitive representations of CU resulting in better QoL outcomes has far more reaching implications then supporting the implementation of CSM interventions. It implies that CU aetiology may in part be implicated in psychological (or socio-cognitive) mechanisms that are able to improve CU QoL-related outcomes outside of the medical model. Such findings suggest a role for psychological process in CU outcome that is in opposition to existing CU research attempting to identify the physiological mechanisms that are considered as the driving force of CU process and outcome (see Section 1.2, p 5). The findings further help to contribute to how CU psychological processes actually function specifically in CU which is still largely misunderstood compared to other skin disorders (Gupta and Gupta, 2012).

Indeed CU researchers may need to see CU more bio-psychosocially not just in terms of QoL outcomes and how CU medicines may impact on bio-psychosocial functioning over time, but in how psycho-educational processes and action plans may be complementary in CU medical RCT's. Together both may potentially allow participants to not only make more knowledgeable decisions about self-managing symptoms through CU medicines, but the knowledge itself may lead to better self-regulation and internal control of the self. Such strategies may result in a reduction in CU medication usage over time (or better adherence to prescribed medicines). Further, such strategies may help reduce the financial burden of healthcare costs incurred by patients including that of CU medicines which are usually taken in highly individualised and different combinations; Zuberbier et al. 2009b).

The Intervention fills a Gap in the Absence of a Psychological Intervention in CU

The main findings of this study do not only have implications for CU research but also for CU-related clinical practice. CU management guidelines stipulate that there are no CU

psychological interventions (Zuberbier et al. 2009b, 2012; Maurer et al. 2011) Dermatologists and other medical practitioners have often stated that they recognise a role for psychological variables in CU but argue that studies have lacked causality (Zuberbier et al. 2009b). When psychological interventions are applied to dermatological conditions they have been perceived as poorly designed and implemented and it has been hard to decipher what mechanisms are significant and result in changes in outcome (Papadopulos et al. 2005). However, the introduction of MRC guidelines, guidelines for complex behavioural interventions and the work of Michie and colleagues (Mitchie et al, 2004, 2011) on deciphering what behavioural change techniques work with what health models in intervention development has contributed to minimalizing such methodological problems (see section 2.5, p45).

The current intervention has considered many of these concerns as it was designed using MRC guidelines for designing good quality evidence based interventions. More specifically this intervention that was largely acceptable to patients was underpinned within a theoretical framework (Craig et al. 2012; Campbell et al. 2000) where the underlying mechanisms within the framework and important outcomes had been determined through modelling. Further although complex in its design the intervention undertaken in this study was transparent and easy to implement as its structural elements were clearly defined as proposed by Davidson et al. (2003) and individual behaviour change techniques were mapped onto the models behavioural determinants as recommended to facilitate behaviour change (Abraham and Mitchie, 2008; Mitchie et al, 2004, 2011). Most important the path from CU process to outcome could be measured, analysed and evaluated throughout the intervention. Such well-developed strategies as those implemented in this study may act as a framework for health professionals working with individual's with CU to help them understand their condition more which may lead to better plans of actions, especially for those who find CU patients difficult to work with, however this may work better for urticaria specialist dermatologists, nurses and psychologists who themselves have a

better knowledge of CU identity, cause, timeline, consequences, control and treatments.

A Partner or Significant Other maybe an Instrumental (but not compulsory) Source of Support

An important finding of the intervention was the overall insignificant role of patient characteristics across the course of the study (especially for cognitive representations) however there was evidence to suggest that being married or co-habiting with a partner may act as a moderating factor on particular outcomes. Inter-correlations between the study variables found a weak but significant relationship between marital status (i.e. being married/ co-habiting) at post intervention and follow-up QoL (both $p < .05$) but not baseline reports and a strong and significant negative relationship between being married/ co-habiting with levels of baseline, post-intervention and follow-up levels of anxiety ($p < .01$). This is not the first time that marital status has emerged as one of the few socio-demographic variables to significantly impact CU outcome as it explained a significant 9.0% of the variance in the CSM model of GMHS in study 4 (F (1, 74)= 3.09. p< .01) and with age predicted 15.0% of the variance in disease-specific QoL (F (1, 74)= 3.77. p< .01). In Study 4 the presence of a partner was discussed in relation to it possibly enhancing interventions further as a source of support for the CU patient and research has supported the positive impact of partners in CSM interventions (Sterba et. al. 2009; 2009b; Keogh, et al. 2007) however contradictions did occur between this study and study 4. Although marital status is somehow implicated in CU it did not correlate with anxiety at all in study 4 as it did very strongly here. In contrast its ability to predict GMHS in study 4 was contradicted here also as this was insignificant. Why this has occurred is difficult to decipher but candidates might include cross-sectional verses longitudinal reports, feeling different when one is embarking on a new intervention for CU that is psychological in nature or even knowing that one is going to receive some form of new professional support and input. Although marital status was found to not be a co-variant of outcome in the main analysis it did appear to reduce the effect and this indicates that it plays a role somewhat that requires future research investigation.

A CSM Intervention to Change CU Cognitions & QoL Outcomes is Acceptable to Patients

One of the main aims of the intervention was not only to see significant improvements in cognitions and QoL outcomes but to also examine the participant's experiences during the course of the study. It was evident from the findin'gs that the majority of the research sample was happy about the way they were approached and recruited and they were happy with completing the questionnaires and undertaking the interviews. The most rewarding aspect was the core aspect of the intervention, which was to challenge cognitive representations and impart new knowledge and understanding and all participants reported that the researcher always respected opposing viewpoints, however areas for improvement were also highlighted.

Approximately a fifth of participants experienced difficulties in understanding the explanation of the study at recruitment and in the intervention itself around a fifth had concerns about the knowledge contents of emotional representations and a quarter did not like its delivery. Over half of participants were also unsure about the control aspects of the intervention. The biggest concern involved the action plans. Despite their ease of use participants were undecided on their usefulness. The second concern were the equal numbers of participants who either agreed or strongly agreed as to the efficacy of the intervention and those who were undecided (however no one disagreed with it).

In respect to understanding the recruitment material participants could have been involved in the development of the instruments in terms of assessing the language and the layout but the concens raised about the control and emotional aspects of the intervention in the context of CU makes sense. They are two of the aspects of CU that patients often report to be the most problematic and not adequately addressed by health professionals in general (e.g. Zuberbier et al. 2009b; Maurer et al. 2009a, b, 2011). If this study were to be replicated, the researcher may need to take the lead in raising and addressing both control and emotional aspects in the action plan phase as standard to all participants in addition to other areas they would like to address as

a priority as the study evaluation indicates that psycho-education alone for both components was not enough. Undertaking this strategy may allow for the actual action plan to be evaluated as a more fruitful part of the intervention that contributes to improving QoL outcomes even if this only consists of discussing what procedures will be undertaken to improve control and emotional representations for the participant beyond the researchers skills remit (e.g. psychological therapy referral or appointments to discuss sub-optimal medicines with a consultant dermatologist). This might also address why treatment control perceptions not only failed to change over time but also did not correlated to changes in QoL outcomes over time (both discussed earlier). The concerns regarding addressing emotional representations in the intervention were already discussed on pages 287 and 288 and does mirror the participants' evaluation in that it required a more practical approach in action planning then just raising CU emotional awareness.

Methodological Issues and Considerations

Despite the novel findings and insights of this study, numerous methodological considerations required discussion. The current study was originally planned as an RCT but the high attrition rates, particularly from the control group instigated a study redesign to incorporate a within group repeated measures design to maintain the longitudinal nature of the study. Although not an RCT (and creating difficulties in analysing cognitive change on QoL outcomes) such designs are advantageous as each participant acts as their own control and within-group variance is significantly reduced (Howitt & Cramer, 2011). Further it also allows for fewer participants to be analysed in respect to the smaller sample (Howitt & Cramer, 2011). A major reason for attrition was that this study was competing with studies recruiting patients to CU pharmaceutical trials for which the drugs on trial became routine care for the patient and an exclusion criterion for this study. In addition to sample size concerns the intervention could have benefited from a more standard six-month (and even one year) follow-up period which would determine better whether cognitive and QoL-outcome change relationships either maintained or

declined over a longer time period of time and therefore further validating the intervention. Dispite this the study still presented with a good degree of power and effect size.

This study would have benefited with a grant, which would have allowed for more home visits to patients and for a larger study that could have recruited patients with CU in GP surgeries in primary care or other hospital dermatology departments. Such larger scale studies would require the training of staff to learn more about CU and its treatment through training days and workshops so that they could implement the intervention as required. Further more funding would have allowed for the development and creation of promotional material such as booklets, leaflets and/ or a website for both health professionals and patients which tell them more about CU under the components of the CSM and how to access relevant services. This would have complemented the intervention. Other considerations include undertaking it as a group intervention similar to Fortune et al. (2004) psoriasis CSM intervention. Some of the sessions in the intervention lasted up to ninety minutes and in reality this is not feasible or cost effective. Another strategy raised in study 4 was to develop a training strategy to help health professionals who work with CU to raise the issue of patient's perceptions during consultations. The development and piloting of the CU intervention reported in this chapter would support a funding proposal as it is more clearly defined in terms of MRC and other guidelines then other CSM interventions reported in the literature. Unfortunately this study was in principal supported by a provisional grant through St John's Institute of Dermatology, London but it would have meant implementing it considerably beyond the timeline for completing the thesis as a whole.

9.5: Conclusions

This is the first study to attempt the development and piloting of a CU psychological intervention. It is a complex intervention designed to be transparent and easy to replicate. The study supported that a brief intervention designed to change cognitive representations of CU can also result in significantly better self-reported QoL outcomes.

Chapter 10

General Discussion

10.1: Chapter Summary and Overview of Theses Findings

Chronic Spontaneous Urticaria (CU) has unknown aetiology and negatively impacts quality of life (QoL). One modifiable factor is ones illness representations that the Common-sense Model (Leventhal, Meyer and Nerenz, 1980) predicts guide coping procedures that impact outcomes. The aim of the thesis was to test the model in CU and determine if representations and QoL in CU were amenable to change via intervention. The thesis produced evidence to support the following:

1. Individuals with CU hold illness representations in relationships predicted by the CSM.
2. These representations relate to aspects of quality of life outcome independent of coping.
3. Disease-specific representations entail managing psychosocial/ appearance issues.
4. CU representations are amenable to change and result in better self-reported QoL.

In addressing preliminary methodological issues the following was also supported

1. CU has a moderate impact on QoL and with a similar impact on bio-psychosocial aspects.
2. Quality of life in individuals with CU is more impaired than healthy adults and similar or worse in certain aspects compared to other chronic conditions.
3. Quality of life in CU is best measured with the SF-36 and CU-Q_2oL.

The aim of this chapter is not to discuss these results in great detail (as this was done extensively in the respective chapters each finding was reported in, but moving forwards to looking at findings as a whole and sum-up the possible impact they might have on how quality of life in CU is researched, how practitioners view CU management and how patients with CU perceive its self-regulation. It is only through the findings relevance to the care of these patients in relation to CU research and management practices that they are more likely to be utilized by research-practitioners and contribute to actual patient care in real life.

10.2: Contribution of Thesis to CU Quality of Life Research, Practice and Policy

10.2.1: CU Quality of Life Research

The original main aim of the thesis was to integrate quality of life research and practice in CU within the socio-cognitive framework of the CSM. As introduced in the preface and chapter 1, CU has a significant negative impact on QoL in which existing biomedical causal theories do not predict which mechanisms or mechanisms of change (i.e. avoiding triggers and taking CU medicines/ treatments) predict outcomes (Saini, 2011; Zuberbier et. al. 2014). Although there is already a growing empirical research literature on psychological process and outcome in CU, much of this is data-driven (see sections 1.2.3, 1.3, 2.4.2) and the classification of CU is not always clear (a problem that still endures; Toubi, Grattan and Zuberbier, 2015; Gimenez-Arnau, Grattan, Zuberbier and Toubi, 2015). The major contribution of the thesis is that it has placed CU within an alternative well-established psychosocial framework that has a strong empirical evidence base. More specifically the CU research data has provided strong evidence to support that CU cognitive representations act as not only mechanisms of CU-related QoL but (acted upon) they can serve as mechanisms of change using standardized behavior change techniques (Michie, Atkins and West, 2015).

For CU research the above discovery is a momentous theoretical and empirical leap as it challenges the view that CU should only be studied as a pathophysiological phenomenon. Even though a social-cognitive etiology has not been proven outright here the socio-cognitive processes of CU perceptions and emotional representations are somehow implicated significantly to CU processes when the disease is already acquired and implicated to its maintenance and QoL-related outcomes. Second unlike existing CU bio-medical models, the path from process to outcome can be followed and evaluated suggesting that by using mechanisms of cognitive representation change (i.e. self-regulation BCT's and challenging perceptions) aspects of QoL outcome can be changed in a more positive direction. In essence

from a psychosocial viewpoint, CU appears (at least from these research data) not to be 'an enigma' as viewed from a medical and lay perspective (Zuberbier, Grattan and Maurer, 2009; Weller et al. 2012), as it seems to have some defined predictable path. However it must be acknowledged that pathophysiological theories have contributed to understanding it more (see section 1.2.2, p5), hence it is suggested that CU research needs to not move away from bio-medical models but to incorporate socio-cognitive components (e.g. cognitive representations) as part of a more bio-psychosocial approach to broaden the CU causal model and therefore increase lines of investigation to improve outcome.

As measuring QoL is a primary outcome in CU research, one way of incorporating cognitive representation measures is within drug trials. They may help to determine how perceptions of CU illness and treatment change over the course of treatments designed to improve QoL. Such instruments could also be used as a screening tool to establish baseline perceptions of CU prior to a trial. This would allow any misconceptions at the start to be challenged leading to participants to hypothetically adhere to study protocols more.

From a psychological research perspective future research needs to further explore the CSM precursors of social messages and symptom perceptions more, not only from the patient's perspective (as discussed in section 7.4) but from the research-practitioners perspective also. In the IPA (Chapter 8) themes emerged that reflected the research literature that health professionals working with CU lack adequate knowledge of the disease, find it difficult to treat and its patients difficult to manage or satisfy, reflecting the research literature (Weller et al. 2012). Interpretations of the IPA suggested that these helped to form the patients own perception of their CU as a condition that is '*difficult to understand or be understood'* (see Table 8.2, p221). Exploring the researchers and health professionals own CU symptom perceptions, social messages and representations in relation to CU and CU-related QoL might provide some insight into how practitioners and patients draw different perceptions and views.

10.2.2: CU Quality of Life Clinical Practice and Patients

Indeed the successful integration of CU into a psychosocial framework such as the CSM has direct benefits to health professionals in clinical practice and presents as the second major contribution of the thesis. From a sole bio-medical perspective CU might seem like a difficult to treat condition to practitioners due to its unknown etiology and treatment options, which cannot guarantee better outcome. Together with a lack of knowledge and understanding of CU and limited options available to help the patient, practitioners may either feel like they are failing their patient or externalising the inability to help by transferring the blame towards the patient. The CSM framework applied provides the practitioner with a script to follow to help communicate with the patient in a more effective way (see section 9.2.3, p257). Practitioners can raise the issues of CU perceptions during consultations in terms of its components and challenge any misconceptions using these strategies or they can use empirically supported BCT's as mechanisms of change for those components. A script is important as research suggests that it is the communication of the CSM that results in the uptake of newly learnt behaviors and less so the interpersonal skills of the practitioner (Philips, Leventhal and Leventhal, 2011). Such communication may not only highlight misconceptions that were affecting outcomes, but also interpersonal, social and appearance issues which may require a psychology referral.

Despite these new initiatives for supporting individuals with CU, pathophysiological breakthroughs that have contributed to understanding CU more (Maurer, Church, Goncalo, Sussman and Sanchez-Borges, 2015) again cannot be ignored and increasing the patients necessity to take CU medicines and reducing their concerns about side effects through discussing treatment beliefs might increase QoL outcome and adherence to treatment (of course a measure of adherence would also be required). As discussed in Chapter 7 it was difficult to decipher whether CU medicines are sub-optimal because the patient has misconceptions about regular intake or whether the medicines were actually not satisfactory, however the intervention

and qualitative study did provide insights suggesting both scenarios, reflecting the research literature (Maurer et al. 2011; Maurer et al. 2009b).

For the CSM to work in clinical practice (as discussed in detail in chapters 7 and 9) it needs to be considered that skin health professionals require the skills training to raise perceptions with patients, undertake those BCT's and know when issues surpass their skills set and refer on to psychology services. In essence such training and its application takes part of the control of the condition from the practitioner to the patient. By having misconceptions of CU challenged and by assimilating and adopting new perceptions and BCTs, the patient is able to self-regulate and manage symptoms and consequences better, still under supervision but independently from professional care in everyday life.

10.2.3: CU Quality of Life Policy

In order for new interventions to be adopted and applied to practice by practitioners they are best integrated into consensus guidelines for CU management. Although the original guidelines for CU management state that psychological interventions are necessary, they only focus on avoiding triggering factors and the level of evidence for CU drug interventions (Zuberbier et al. 2009b). This hasn't changed in a recent updates (Zuberbier, Aberer, Asero, Bindslev-Jenson, Brozoza, Canonica et al, 2014) and a way to change this is to promote psychological interventions where the path from process to outcome can be evaluated. Another major contribution of the thesis is that it has provided the stepping-stones for this within the remit of MRC guidelines and guidelines for behavior change interventions (Mitchie et. al, 2015; 2011; 2008; 2004) and therefore presents the CSM as a model for improving CU-related quality of life at conferences to improving quality of life related outcomes.

Health psychologists will be integral to this new development as they have the trained expertise in research, teaching, training and developing/ delivering evidence based interventions

that can only contribute to the growing multi-disciplinary area of psycho-dermatology that in practice is recognizing the need to incorporate psychology services in the UK (Turner, Smith, Thomas and Jackson, 2015). The work in this thesis through systematic reviews, psychometric analyses, empirical research and intervention development, application and evaluation is a testament to this. Since the undertaking of the thesis there have been further major developments in respect to guidelines on undertaking CSM interventions (Jones, Smith and Llewellyn, 2015), using BCT's in behavior change interventions as mechanisms of change (Michie, et. al 2015) and new MRC guidelines on process evaluating complex interventions with cognitive components (Moore, Audrey, Barker, Bond, Bonell, Hardman et al, 2015) that was lacking. These developments utilised appropriately can only help to improve the methodological rigor of the next potential stage of this thesis which would be to undertake a large scaled RCT aimed as changing perceptions and CU-related QoL outcomes in CU.

10.2.4: Reference Values and Measurement

Before the methodological limitations of the thesis as a whole is discussed, it is worth mentioning again the contribution it has made to studying chronic spontaneous urticaria (CU) itself. During the introductory chapters a case was presented for the need to integrate CU outcome into socio-cognitive models to explore new potential predictors of outcome, however in doing so it became clear that studying CU itself was problematic. Prior to the thesis issues regarding classifying CU, the homogeneity of CU samples within studies and the use of different QoL instrument types across CU studies emerged (discussed in detail in previous chapters) and it was decided that these would have to be resolved before investigating the thesis' main aims and objectives. A major contribution of the thesis is that it has attempted to provide both researchers and practitioners with standardised CU epidemiological and QoL-related measurement reference values analysed by systematic reviews which can be referred to for comparison in future studies. Indeed these values and measurement recommendations as

intended were used in the proceeding studies where patient characteristics and findings reflected the wider research literature. Importantly these novel studies present new insights into CU-related QoL in formally diagnosed homogenous samples of patients with chronic spontaneous urticaria. Since the undertaking of this thesis a separate questionnaire to measure angioedema-related QoL separately to urticaria (the AEQoL) had been produced (Welden, 2014) and an area for future research would be to use this instrument to explore cognitive representations of angioedema and decipher whether patient characteristics produce similar results and similar impact on QoL. As discussed in detail in chapter 7 whether QoL outcome data will be used for testing the efficacy of CU medicines as to targeting predictors of aspects of QoL including looks and appearance remains to be seen.

10.3: Thesis Studies Contribution to Understanding the CSM

As the study of the CSM has contributed to a better understanding of CU process and outcome, the data collected from CU research participants has also contributed to understanding the the CSM and its measurement. Firstly, in the IPA reported in Study 5, interviewees described the regular pruritic wheals and swellings that emerged in CU but also the tingling and pain sensations experienced that led them to label this occurrence as urticaria. Such reports are evident of the CSM's symmetry rule of linking symptoms to labels and labels to symptoms (e.g. Meyer, Leventhal and Gutman, 1985; see section 2.2.1) however the quantitative IPQ-R illness identity subscale by Moss-Morris et al. (2002) does not cover sensations. Further although it accounts for deciphering identity from somatisation it may also encourage symptom over-reporting. Participants of study 5 responding to open-ended questioning only reported itching and swelling but in study 3 approximately 7 symptoms were chosen from the IPQ-R. In light of this there is maybe a need to consider changing to an open scale that includes questions on sensations. Second, coping is an integral component of the CSM governed by cognitive representations of illness (the IF-THEN rule) and acting as a mediator between representations

and outcome. The IF-THEN rule was to a degree supported in Study 4 (see Section 7.3.6, p190) but mediation failed to occur, contributing to on-going debates as to the importance of coping in the CSM (see section p27).

10.4: Methodological Considerations and Limitations

This thesis has produced novel insights into quality of life, self-regulation and CU however they need to be considered in light of the limitations of the methods used. The studies consisted of a high number of female participants. Such a bias may suggest that the findings are only applicable to CU in women. However as stipulated in Chapter 1, females greatly outnumber males in CU and such ratios were confirmed in the systematic review study so indeed the participants were representative of the condition and the research literature. It was this that guided the decision to include women only in qualitative study 5. In doing so maybe there was a missed opportunity to explore CU in a small male sample to examine possible gender differences. Researches may consider exploring this in future including deciphering whether being female is characteristic of CU or if less males seek professional help.

Another issue related to participants was that they were recruited from an NHS tertiary service. Patients from tertiary services may present with more severe disease and not be representative of those in primary care. However the patient characteristics within the thesis studies largely matched those of the CU literature, hence it is argued that the participants in the thesis were representative of the CU literature.

Issues did pertain to the preliminary studies that were undertaken to strengthen the methodology of the thesis. The data of the QoL systematic review study were qualitatively reviewed however the diverse range of QoL instruments using different domains, scoring systems and levels of specificity made quantitative analysis impossible. Further the items of the different CU-Q_2oL's could have been entered into a single meta-analysis to determine a new

instrument. Such an analysis could be undertaken in future.

The Hospital Anxiety and Depression Scale was used to measure psychological distress and was a good model fit of the CU data via PCA however it needs to be considered that it is not a diagnostic measure of clinical state anxiety and depression but merely a clinical indicator of it. A diagnostic approach would have been ideal but was outside the practicalities and financial resources of the thesis. Further, the failure to find coping as a significant mediator may have been reflected in using a generic measure but the COPE questionnaire is a popular instrument for studying coping in the CSM, (see Table 2.1, p38), however it might not make it the most appropriate and researchers may consider developing a CU disease-specific instrument.

One of the shortcomings of Study 4 was that it was based on a cross-sectional design and despite the path analysis undertaken no real causal inferences could be made. The CSM proposes a path from cognitions, coping to outcome but it is possible for QoL to guide coping behaviour that in turn change the cognitive representation, indeed the dynamic nature of the model does allow for this bottom-up processing. The longitudinal design of the intervention somewhat attempted to resolve this however the interventions high attrition rates and the elimination of the control group did not really allow findings to be as generalizable as they could have been. In light of this the intervention was found to have adequate statistical power and effect size and its well-structured development and implementation to relevant guidelines suggested a strong potential to undertake it as an RCT.

10.5: Conclusions and Future Directions

The six studies undertaken in this thesis have provided strong evidence to support that chronic spontaneous urticaria is implicated in not only bio-psychosocial outcomes but also bio-psychosocial processes. It has highlighted the need to understand CU first as an illness and how quality of life is realistically experienced. This needs to be measured appropriately in order for

the exploration of new (and old) possible contributors of its process, maintenance and outcome to be adequately explored. Only by doing this and in a multifaceted way can dermatologists and psychologists help the patient with CU to self-regulate this condition better. In undertaking this empirical challenge the thesis has supported that quality of life outcomes in CU can be determined by cognitive representations of illness and further challenging patients existing negative and maladaptive representations can result in better self-reported quality of life and reduced psychological distress.

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Appendices

Appendix 1

Quality of Life in Chronic Urticaria: Systematic Review (Study 1)

Excluded Papers, Data Extraction Sheet and Criteria

Appendix 1

Study 1 Systematic Review List of Excluded Papers

a) List of Excluded Studies: 6 Reviews in English (bold) and 11 Studies/ other reviews

Study Reference	Reason for Exclusion
Aguilar N., Mendez N.H.S., Lugo-Reyes S. (2012) Chronic urticaria quality of life questionnaire (CU-Q2 OL) and urticaria activity score (UA S). World Allergy Organization Journal. Conference: 22nd World Allergy Congress Cancun Mexico. Conference Start: 20121204 Conference End: 20121208. Conference Publication: (var.pagings). 5 (pp S193	Conference abstract CU-Q2oL (full text not accessible)
Aydogan K, Karadogan, S.K., Tunali, S. & Saricaoglu, H. (2012) Narrowband ultraviolet B (311nm, TL01) phototherapy in chronic ordinary urticaria, *International Journal of Dermatology*, 51 (1): 98-103	Measures QoL with no questionnaire but daily activities, sleep & flare-up rates
Baiardini I, Braido F., Bindslev-Jenson et al (2011) Recommendations for assessing patient- reported outcomes and health related quality of life in urticaria: a GALEN taskforce report position paper, *Allergy,66* (7), 840-844	Review only
Basra, M.K.A, Fenech, R, Gatt, R.M., Salek, M.S. & Finlay, A.Y. (2008) The Dermatology Life Quality Index 1994-2007: comprehensive review of validation data & clinical results. *British Journal of Dermatology*; 159: 997-1035.	Review
Blaziene A., Chomiciene A., Muldaryte V. (2011) Quality of life impairment in chronic urticaria patients in Lithuania. *Annals of Allergy, Asthma and Immunology*. Conference: 2011 Annual Meeting of the American College of Allergy, Asthma and Immunology Boston, MA United States. Conference Start: 20111103 Conference End: 20111108. Conference Publication: 107 (5 SUPPL. 1) (pp A124), 2011.	Only used one subscale of SF-36 to assess QoL
Camarasa, J.M., Aliaga, A., Fernandez-Vozmediano, J.M., Fonseca, E., Iglesias, L., Tagarro, I. (2001) Azelastine tablets in the treatment of chronic idiopathic urticaria. Phase iii, randomised, double-blind, placebo and active controlled multicentric clinical trial, *Skin Pharmacology and Applied Skin Physiology*, 14 (2): 77-86	Full QoL measure absent
de Ue A.P.F., de Souza P.K., Rotta O., Furlani W.J., de Lima A.R.M., Sabbag D.S.O.V (2011) Quality of life assessment in patients with chronic urticaria. <Estudo da qualidade de vidanospacientes com urticariacronica.>AnaisBrasileiros de Dermatologia. 86 (5): 897-904)	Review Not in English
Grob j., Gaudy-Marqueste, C. (2006) Urticaria and Quality of life, *Clinical Review Allergy Immunology*, (30), 1: 47-52	Review with studies already included
Jauregui I. Bartra J. delCuvillo A. Davila I. Ferrer M. Montoro J. Mullol J. Sastre J. Valero A. (2011) Bilastine and quality of life. Journal of Investigational Allergology& Clinical Immunology. 21 Suppl 3:16-23,	Full QoL measure absent
Kini, S.P. and DeLong, L.K. (2012) Overview of health status quality of life measures, *Dermatology Clinics*, 30 (2): 209-21Le Cleach, L, Chassany, O,	Review
Levy, A, Wolkenstein, P, Chosidow, O (2008) Poor reporting of quality of life outcomes in dermatology randomized controlled clinical trials, *Dermatology*, 216 (1): 46-55 [Web of knowledge SCI/ SSCI]	Review

List of Excluded Studies- Studies 1 continued

Study Reference	Reason for Exclusion
Maiti R., Jaida J., Raghavendra B.N., Goud P., Ahmed I., Palani A. (2011) Rupatadine and levocetirizine in chronic idiopathic urticaria: A comparative study of efficacy and safety, *Journal of Drugs in Dermatology*. 10 (12):1444-1450	Not a formally recognised measure (Aerius Quality of life questionnaire)
Rajan, N., Darne, S., Ah-Weng, A, Carmichael, A.J. (2010) Dapsone as adjuvant treatment in chronic ordinary urticaria: positive implications for quality of life, *British Journal of Dermatology*, 163 (supp 1): 49, 90th Annual Meeting of the British-Association-of-Deermatologists British Association of Dermatologists	Conference abstract – Full information not accessable
Welden, D.R. (2006) Quality of life in patients with Urticaria, *Allergy and Asthma Proceedings*,27: 96-99.	Review
Weller, K., Church, M.K., Kalogeromitros, D. et al (2011) Chronic spontaneous urticaria: how to assess quality of life in patients receiving treatment, *Archives of Dermatology*, 147 (10): 1221-3	Review
Weller K., Koti I., Maurer M. (2012) Anxiety and depression are less frequent in patients with autoreactive as compared to non autoreactive chronic spontaneous urticaria. *Experimental Dermatology*, Conference: 39th Annual Meeting of the ArbeitsgemeinschaftDermatologischeForschung, ADF 2012 Marburg Germany. Conference Start: 20120301 Conference End: 20120303. Conference Publication: (var.pagings). 21(3) (pp e20), 2012.	Not QoL measure after inspection of full text
Ye Y., Lee Y., Park J., Kim S., Choi J., Hur G., Lee H., Lee E., Park H. (2011) Chronic urticaria specific quality of life questionnaire (CU-QOL) in patients with Chronic Urticaria, *Journal of Allergy and Clinical Immunology*. Conference: 2011 American Academy of Allergy, Asthma and Immunology, AAAAI Annual Meeting San Francisco, CA United States. Conference Start: 20110318 Conference End: 20110322. Conference Publication: (var.pagings). 127 (2 SUPPL. 1) (pp AB41),	Conference abstract-limited information

Study 1: Quality of Life in CU: Systematic Review – Data Extraction Criteria

Part 1: General, study and participant characteristics

(a) General information: (i) Study reference *(author, article, citation, country of origin, funding source)*

(b) Study characteristics: (i) study design *(randomized controlled trial; cohort, case-controlled; cross-sectional; case report; pre-post-test, questionnaire validation)*; (ii) study aims and objectives (iii) level of service/ location of study: *primary care* (e.g. GP surgery), *secondary care* (i.e. general or dermatology hospital outpatients); *tertiary care* (i.e. specialist urticaria clinics), *university*; (IV) descriptor of sample: *spontaneous*, *ordinary*, *idiopathic* (CIU), *autoimmune* (CAU); (V) comparison group.

(c) Participant characteristics: (i) sample size; (ii) gender (*number, ratio or percentage*); (iii) age (*in years as the mean, SD and range*); (IV) disease characteristics (*reported: yes/ no; severity)* and activity score and scale (*mild, moderate or severe*); instrument used: *urticaria activity score* (UAS), other.

Part 2: Quality of Life outcome data and results

(a) QoL assessment/ analysis: (i) Questionnaire(s) *name*; (ii) questionnaire type/s was classified as *generic, dermatology-specific or disease-specific*. If measures were culture or study specific this was documented. Whether assessing quality of life was a *primary* or *secondary outcome* was stated.

(b) Baseline overall QoL: (i) conclusion of study; (ii) overall QoL score; (c) baseline aspects of QoL (i) physical functioning; (ii) psychological functioning; (iii) social functioning.

Part 3: Relationship between patient characteristics and quality of life

(a) Clinical variables on QOL: The *correlation coefficient* and *significance level* was reported for disease-severity/ activity and other clinical variables that were correlated with quality of life

(b) Socio-demographic variables on QOL: *Reported correlation coefficients and significance levels.*

(c) Other factors identified with QOL: *Correlation coefficients* and *significance levels* were reported.

Other identified outcomes associated and/ or with QoL were also reported including whether the analysis was univeriate or multi-variate.

Part 4: reference samples

Where CU was being compared to other populations, the mean scores, SD and probabilities were compared for a) other skin disorders (b) chronic diseases and c) healthy populations.

1. **Socio-demographic and clinical variables data are described:** Met if age, gender, disease-severity and disease-duration present; partially met if one was presented.
2. **Inclusion and/or exclusion criteria are formulated:** Met if a study had clearly stated the definition of the study sample and who were included and excluded from taking part; partially met if a summary of included participants were described.
3. **Process of data collection is described:** Met if data collected was adequately described in a way so that the procedure could be replicated by others.
4. **CU treatment described at baseline:** Met if participant treatments were described at baseline.
5. **The results are compared between two groups or more:** This criterion could be met in a number of ways: (I) comparing patients with CU to healthy controls ii), dermatological conditions, III) non-dermatological illnesses or IV) other urticaria; also met if studies divided participants by socio-demographic, clinical, treatment and psychological factors.
6. **Participation and response rates for groups:** Met if the number of those participating in the study was reported plus those who refused to take part at baseline; partially met if only the participation rate was reported. This concept is different to the attrition rate.
7. **Patient characteristics of responders/ non-responders presented:** Met if differences in patient characteristics of those taking part and those who refused at baseline were presented.
8. **Valid QoL questionnaire was used:** (e.g. SF-12 (Ware et al, 1996; SF-36 (Ware and Sherbourne, 1992), NHP (Hunt, McEwen, McKenna, 1985); WHOQOL-BREF (WHOQoL Group, 1998b); Skindex (versions 16 and 29; Chren et al. 1997); V-Dermato (Grob et al. 1999); DLQI (Finlay and Khan, 1994), (FLQA-d; Augustin et al. 2000) and (CU-Q_2oL; Baiardini et al. 2005). Studies using both a generic and specific instrument fully met the criteria and those using one partially met it.
9. **Results described for both QoL and physical, psychological and social functioning:** Met if overall baseline QoL scores as QoL aspects were reported. As some instruments have a composite score the full criterion was met if studies just presented information for the individual aspects. A criterion was partially met if only an overall score was given.
10. **Mean, standard deviations or percentages are reported for important outcomes:** Met if baseline QoL and disease-severity data was presented; partially met if severity was absent.
11. **Attempt made to find determinants with the highest prognostic value:** Met if the study explored determinants/ correlates of QoL or factors changing self-reported QoL. This included experimental studies determining if an intervention changed QoL scores.
12. **Patient signed an informed consent form:** Met if it participants signed a study consent form. It was also met if studies reported approval by an official research ethic committee as informing consent from participants is usually a compulsory part of approval.

    Two criteria included by Kuijpers et al. (2004) but omitted in Mols et al. (2005) are described below:

13. **Power analysis:** Calculated of sample size presented.
14. **Quality of reporting:** There are many criteria available for quality of reporting but in this review this was judged upon whether it proved difficult to abstract data from studies due to lack of reporting,

Full Reference.....

General	Study characteristics		Participant characteristics	Quality of Life	
First Author/ Country/	SD: Study Design AO: Study Aim/ Objective	S: Service/ D:CU Descriptor C: Comparison	S: Sample Size/ G:Gender A: Age in years	M: Measure MS: Mean I:Importance/ O: Other	Study and QoL Conclusions
A:	SD:	S:	S:	M:	
C:	AO:	D:	G:	MS:	
		C:	A:	I:	
			Second group	O:	
			S:		
			G:		
			A:		

Notes:.....

Appendix 2

Quality of Life Measurement in Chronic Urticaria: Systematic Review (Study 2)

Data Extraction Sheet and Criteria

Study 2: Quality of Life Measurement in CU: Systematic Review – Data Extraction Criteria

Part 1: General Questionnaire Information

Name/ abbreviated title (*different versions counted as one*); Type (*generic, dermatology-specific, disease-specific*); Authors; Language (*original; translations*); Original study population (*general population, healthy adults, dermatology patients*).

Part 2: Questionnaire Construction: Description and Feasibility

Development:

(a) Measurement goals; Study purpose for evaluation (*measuring changes in patients over time*) or discrimination (*measuring differences between patients at one period in time*)

(b) Questionnaire item generation (*clinicians; patients, research literature)*

(c) Item reduction (*conceptually, patient feedback, statistical analysis).* These approaches are used to theme items into dimensions.

Description: Number of items/ domains; response scale; scoring; timeframe.

Feasibility: Patients understanding of instrument; completion time.

Validation Study: Questionnaires need to be tested for reliability/ validity in samples of approximately 100 to establish representativeness of its target population: Total sample; CU in sample (*yes, no*)? In re-validation papers the criteria was based on testing the structural validity and internal reliability of the instrument (factor analysis, Cronbach alpha).

Part 3: Psychometric Properties

Reliability: The extent to which a measuring instrument is free from random error. The two types are:

- ***Internal:*** Items in a domain should measure the same concept and this is usually presented by a Cronbach α correlation statistic of between 0-1 (0.7 at group level and 0.9 individual).
- ***Test-retest***: Under similar conditions patient's questionnaire scores from two separate occasions and administered by the same person should give similar results. The T-test (no significant difference), *Pearson, Spearman or intra class* correlation coefficient (-1 to 1) should be reported (0.70 for groups, 0.90 for individuals) where 1 is a positive correlation.

Validity: This is the extent to which a questionnaire measures what it purports to. The two types are:

Content Validity: Items and domains should cover the theoretical construct being measured.

Breadth of coverage is assessed by patients, experts or both.

Construct Validity: A measure should behave consistently in line with its hypotheses.

- ***Convergent validity:*** The instrument correlates with the gold standard or established questionnaire measuring the same concept. Correlations should fall between 0.4-0.8 (above 0.8 suggests too much similarity known as *item redundancy*).
- ***Discriminant validity***: The questionnaire should be able to differentiate between patient groups that are known to be significantly different (p=<0.05 between groups).

Responsiveness: Instruments ability to measure conceptual changes as they happen. Statistics report significance at p=<0.05 or 0.5 on a scale of 0-1 (moderate to high response).

Clinically Significant Change (CSC): Examines if the statistically significant change is large enough for patients to perceive an actual beneficial difference (also the *minimal important difference* (MID).

Part 4: Cultural Validation

(a) The instrument is forward translated to the target language by two native professional translators of the target language and bilingual in the source one. A combined version is produced between translators and QoL experts of the target country

(b) *Forward translated* instrument is translated *back* to the source language by a third bilingual translator who has had no access to the original. The backward translated and original is compared

(c) Translated instrument is administered to at least 10 patients of the target language before revisions are made for a conceptually equivalent final version.

Quality of Life Measurement in CU Data Extraction Sheets

Full Questionnaire Reference: .....

Instrument Type: .....

1. General Questionnaire Information		2. Construction	Description			Feasibility	Validation Study
Name/ abbreviation/	Language/ Translations	Development	Items/ Domains	Response	Score/ Time Frame	Patient Understanding/ Completion Time	Sample size
Name: Abbreviation:	Original Other	Original sample: Purpose: Measurement Goal: Item generation: Item reduction:	Items: Domains:				Total Sample: CU in Sample:

Notes:.....

Instrument	Construction	Validation	Psychometric Properties			
Abbreviation	Item Reduction/ Factor Analysis	CU Sample Size	Reliability	Validity	Responsiveness	Clinical Sig. Change
			Internal reliability: Test-retest:	Content: Convergent: Discriminant:		

Notes:.....

Appendix 3a

Study Questionnaires/ Instruments

Guy's and St Thomas' NHS
NHS Foundation Trust

LONDON metropolitan university

You & Your Chronic Urticaria Questionnaire

Please complete the following two sections by the ticking boxes as stated for each question

Section 1: Your background (To be used for statistical purposes only)

Your Age: (In years) _____

Your Gender: Male ☐ Female ☐

Ethnicity: (e.g. White) _____ **Nationality:** (e.g. British) _____

Highest Qualification: None ☐ GCSE/ O'level ☐ GCE/ A level ☐ Higher education ☐ Degree/ Higher ☐

Occupation: (Please state) _____

Marital Status: Single ☐ Married ☐ Cohabiting ☐ Widowed ☐ Divorced ☐ Other ☐

Section 2: Your chronic urticaria (To be used for statistical purposes only)

- **I have been diagnosed with chronic urticaria by:** My Doctor (GP) ☐ My Dermatologist ☐
- **My urticaria is:** Chronic idiopathic urticaria ☐ Chronic autoimmune urticaria ☐ I don't know ☐
- **I also experience swelling:** Yes ☐ No ☐ Not sure ☐
- **I have also been diagnosed with physical urticaria** (e.g. cold, exercise induced, please state) _____
- **Age I believe my chronic urticaria begun:** (Please state) _____
- **I believe I have had chronic urticaria for** (Please state) _____ (weeks/ months/ years)
- **Number of times I believe I have visited my Dr (GP) in last 6 months because of CU** (Please state) _____
- **My current chronic urticaria medicines/ treatments are** (Tick as appropriate)

  Antihistamines alone ☐ I do not know ☐ I cannot remember ☐

  Antihistamines and other medications ☐ I do not know ☐ I cannot remember ☐

  Dietary restrictions recommended by dermatologist/ GP ☐ _____

  Other restrictions ☐ (e.g. ibuprofen, please state) _____

- **Areas of my body mostly affected by my CU:** (e.g. legs) _____

Section 3: Other details

- **Have you been diagnosed with another chronic illness** (e.g. diabetes, if yes please state) _____
- **Do any of your family members experience urticaria Yes ☐ if yes how many** _____ **No ☐**
- **Have you had previous counselling/ talking therapy for your urticaria Yes ☐ what type** _____ **No ☐**

Thank you for your co-operation in completing this questionnaire

Version 2: 12th May 2011
Written and compiled by: Ms Delaney Bucknor, Chief Investigator, BSc (Hons), MSc, MBPsS.

ILLNESS PERCEPTION QUESTIONNAIRE (IPQ-R)

R VIEWS ABOUT YOUR CHRONIC URTICARIA

below are a number of symptoms that you may or may not have experienced since your Chronic Urticaria. Please indicate by circling Yes or ether you have experienced any of these symptoms since your Chronic Urticaria, and whether you believe that these symptoms are related Chronic Urticaria.

my Chronic Urticaria	I have experienced this symptom *to my Chronic Urticaria*			This symptom *is related*	
	Yes	No	_____	Yes	No
hroat	Yes	No	_____	Yes	No
a	Yes	No	_____	Yes	No
lessness	Yes	No	_____	Yes	No
t Loss	Yes	No	_____	Yes	No
e	Yes	No	_____	Yes	No
oints	Yes	No	_____	Yes	No
yes	Yes	No	_____	Yes	No
iness	Yes	No	_____	Yes	No
ches	Yes	No	_____	Yes	No
Stomach	Yes	No	_____	Yes	No
Difficulties	Yes	No	_____	Yes	No
ss	Yes	No	_____	Yes	No
f Strength	Yes	No	_____	Yes	No
kin	Yes	No	_____	Yes	No
ng	Yes	No	_____	Yes	No

interested in your own personal views of how you now see your current Chronic Urticaria

indicate how much you agree or disagree with the following statements about your illness by ticking the appropriate

VIEWS ABOUT YOUR CHRONIC URTICARIA	STRONGLY DISAGREE	DISAGREE	NEITHER AGREE OR DIASGREE	AGREE	STRONGLY AGREE
My chronic urticaria will last a short time					
My chronic urticaria is likely to be permanent rather than temporary					
My chronic urticaria will last for a long time					

IP4	This chronic urticaria will pass quickly					
IP5	I expect to have chronic urticaria for the rest of my life					
IP6	My chronic urticaria is a serious condition					
IP7	My chronic urticaria has a major consequence on my life					
IP8	My chronic urticaria does not have much effect on my life					
IP9	My chronic urticaria strongly affects the way others see me					
IP10	My chronic urticaria has serious financial consequences					
IP11	My chronic urticaria causes difficulties for those who are close to me					
IP12	There is a lot which I can do to control my symptoms					
IP13	What I do can determine whether my chronic urticaria gets better or worse					
IP14	The course of my chronic urticaria depends on me					
IP15	Nothing I do will affect my chronic urticaria					
IP16	I have the power to influence my chronic urticaria					
IP17	My actions will have no affect on the outcome of my chronic urticaria					
IP18	My chronic urticaria will improve in time					
IP19	There is very little that can be done to improve my chronic urticaria					
IP20	My treatment will be effective in curing my chronic urticaria					
IP21	The negative effects of my chronic urticaria can be prevented (avoided) by my treatment					
IP22	My treatment can control my chronic urticaria					
IP23	There is nothing which can help my condition					
IP24	The symptoms of my condition are puzzling to me					
IP25	My chronic urticaria is a mystery to me					
IP26	I don't understand my chronic urticaria					
IP27	My chronic urticaria doesn't make any sense to me					
IP28	I have a clear picture or understanding of my condition					
IP29	The symptoms of my chronic urticaria change a great deal from day to day					
IP30	My symptoms come and go in cycles					
IP31	My chronic urticaria is very unpredictable					
IP31	I go through cycles in which my chronic urticaria gets better and worse.					
IP33	I get depressed when I think about my chronic urticaria					
IP34	When I think about my chronic urticaria I get upset					
IP35	My chronic urticaria makes me feel angry					
IP36	My chronic urticaria does not worry me					
IP37	Having this chronic urticaria makes me feel anxious					
IP38	My chronic urticaria makes me feel afraid					

Perception Questionnaire (adapted for CU)Moss-Morris, Weinman, Petrie, Horne, Cameron and Buick (2002)

USES OF MY Chronic Urticaria

re interested in what you consider may have been the cause of your Chronic Urticaria. As people are very different, there is no ct answer for this question. We are most interested in your own views about the factors that caused your Chronic Urticaria rather what others including doctors or family may have suggested to you. Below is a list of possible causes for your Chronic Urticaria. e indicate how much you agree or disagree that they were causes for you by ticking the appropriate box.

POSSIBLE CAUSES	STRONGLY DISAGREE	DISAGREE	NEITHER AGREE NOR DISAGREE	AGREE	STRONGLY AGREE
Stress or worry					
Hereditary - it runs in my family					
A germ or virus					
Diet or eating habits					
Chance or bad luck					
Poor medical care in my past					
Pollution in the environment					
My own behaviour					
My mental attitude e.g. thinking about life negatively					
Family problems or worries caused my illness					
Overwork					
My emotional state e.g. feeling down, lonely, anxious, empty					
Ageing					
Alcohol					
Smoking					
Accident or injury					
My personality					
Altered immunity					

able below, please list in rank-order the three most important factors that you now believe caused Chronic Urticaria. You may use any of the items from the box above, or you may have additional ideas of your own. st important causes for me:-

_____

_____

_____

Beliefs about Medicines Questionnaire (Adapted for CU) Horne, Weinman and Hankins (1999)

BELIEFS ABOUT MEDICINES QUESTIONNAIRE

Your views about medicines prescribed for your Chronic Urticaria

- We would like to ask you about your personal views about medicines prescribed for your Chronic Urticaria (CU).
- These are statements other people have made about their medicines.
- Please indicate the extent to which you agree or disagree with them by ticking the appropriate box.
- There are no right or wrong answers. We are interested in your personal views of your Chronic Urticaria (CU) medicines.

		STRONGLY AGREE	AGREE	UNCERTAIN	DISAGREE	STRONGLY DISAGREE
SN1	My health at present depends on my CU medicines					
SC1	Having to take CU medicines worries me					
SN2	My life would be impossible without my CU medicines					
SN3	Without my CU medicines I would be very ill					
SC2	I sometimes worry about long term-effects of my CU medicines					
SC3	My CU medicines are a mystery to me					
SN4	My health in the future will depend on my CU medicines					
SC4	My CU medicines disrupt my life					
SC5	I sometimes worry about becoming too dependent on my CU medicines					
SN5	My CU medicines protect me from becoming worse					

Thank you for your co-operation in completing this questionnaire

PE – Coping with my Chronic Urticaria

re interested in how you respond when you are confronted with the stress of Chronic Urticaria (CU) in your life.

e are lots of ways to try to deal with the stress of your Chronic Urticaria. This questionnaire asks you to indicate what you do and feel ou experience Chronic Urticaria. Try to think about what you usually do when you are under the stress of (CU)

ond to each of the following items using the response choices listed below. Please try to respond to each item separately in your rom each other item. Choose your answers thoughtfully, and make your answers as true FOR YOU as you can. Please answer tem. There are no "right" or "wrong" answers, so choose the most accurate answer for YOU--not what you think "most people" would do. Indicate what YOU usually do when YOU experience a stressful event.

		I Usually don't do this at all	I usually do this a little bit	I usually do this a medium amount	I usually do this a lot
1	I try to grow as a person as a result of the experience				
2	I turn to work or other substitute activities to take my mind off things.				
3	I get upset and let my emotions out.				
4	I try to get advice from someone about what to do.				
5	I concentrate my efforts on doing something about it.				
6	I say to myself "this isn't real."				
7	I put my trust in God.				
8	I laugh about the situation.				
9	I admit to myself that I can't deal with it, and quit trying.				
10	I restrain myself from doing anything too quickly.				
11	I discuss my feelings with someone.				
12	I use alcohol or drugs to make myself feel better.				
13	I get used to the idea that it happened.				
14	I talk to someone to find out more about the situation.				
15	I keep myself from getting distracted by other thoughts or activities.				
16	I daydream about things other than this.				
17	I get upset, and am really aware of it.				
18	I seek God's help.				
19	I make a plan of action.				
20	I make jokes about it.				
21	I accept that this has happened and that it can't be changed.				
22	I hold off doing anything about it until the situation permits.				
23	I try to get emotional support from friends or relatives.				
24	I just give up trying to reach my goal.				
25	I take additional action to try to get rid of the problem.				
26	I try to lose myself for a while by drinking alcohol or taking drugs.				
27	I refuse to believe that it has happened				
28	I let my feelings out.				
29	I try to see it in a different light, to make it seem more positive.				
30	I talk to someone who could do something concrete about the problem				

		I Usually don't do this at all	I usually do this a little bit	I usually do this a medium amount	I usually do this a lot
31	I sleep more than usual.				
32	I try to come up with a strategy about what to do.				
33	I focus on dealing with this problem, and if necessary let other things slide a little.				
34	I get sympathy and understanding from someone.				
35	I drink alcohol or take drugs, in order to think about it less.				
36	I kid around about it.				
37	I give up the attempt to get what I want.				
38	I look for something good in what is happening.				
39	I think about how I might best handle the problem.				
40	I pretend that it hasn't really happened.				
41	I make sure not to make matters worse by acting too soon.				
42	I try hard to prevent other things from interfering with my efforts at dealing with this.				
43	I go to movies or watch TV, to think about it less.				
44	I accept the reality of the fact that it happened				
45	I ask people who have had similar experiences what they did..				
46	I feel a lot of emotional distress and I find myself expressing those feelings a lot.				
48	I take direct action to get around the problem.				
48	I try to find comfort in my religion.				
49	I force myself to wait for the right time to do something.				
50	I make fun of the situation.				
51	I reduce the amount of effort I'm putting into solving the problem.				
52	I talk to someone about how I feel.				
53	I use alcohol or drugs to help me get through it.				
54	I learn to live with it.				
55	I put aside other activities in order to concentrate on this.				
56	I think hard about what steps to take.				
57	I act as though it hasn't even happened.				
58	I do what has to be done, one step at a time.				
59	I learn something from the experience.				
60	I pray more than usual.				

Thank you for your co-operation in completing this form

Hospital Anxiety and Depression Scale

NFER-NELSON
Health & Social Care

Name ..... Date .....

Clinicians are aware that emotions play an important part in most illnesses. If your clinician knows about these feelings she or he will be able to help you more.

This questionnaire is designed to help your clinician to know how you feel. Ignore the numbers printed on the left of the questionnaire. Read each item and **underline** the reply which comes closest to how you have been feeling in the past week.

Don't take too long over your replies; your immediate reaction to each item will probably be more accurate than a long thought-out response.

fold along dashed line

A 3 2 1 0 D 0 1 2 3

I feel tense or 'wound up':

Most of the time

A lot of the time

From time to time, occasionally

Not at all

I still enjoy the things I used to enjoy:

Definitely as much

Not quite so much

Only a little

Hardly at all

I get a sort of frightened feeling as if something awful is about to happen:

Very definitely and quite badly

Yes, but not too badly

A little, but it doesn't worry me

Not at all

(continued overleaf)

fold along dashed line

D 0 1 2 3 A 3 2 1 0 D 3 2 1 0 A 0 1 2 3 D 3 2 1 0 A 0 1 2 3

I can laugh and see the funny side of things:

As much as I always could

Not quite so much now

Definitely not so much now

Not at all

Worrying thoughts go through my mind:

A great deal of the time

A lot of the time

From time to time but not too often

Only occasionally

I feel cheerful:

Not at all

Not often

Sometimes

Most of the time

I can sit at ease and feel relaxed:

Definitely

Usually

Not often

Not at all

I feel as if I am slowed down:

Nearly all the time

Very often

Sometimes

Not at all

I get a sort of frightened feeling like 'butterflies' in the stomach:

Not at all

Occasionally

Quite often

Very often

(continued overleaf)

HOSPITAL ANXIETY AND DEPRESSION SCALE

fold along dashed line

I have lost interest in my appearance:

Definitely
I don't take as much care as I should
I may not take quite as much care
I take just as much care as ever

I feel restless as if I have to be on the move:

Very much indeed
Quite a lot
Not very much
Not at all

I look forward with enjoyment to things:

As much as ever I did
Rather less than I used to
Definitely less than I used to
Hardly at all

I get sudden feelings of panic:

Very often indeed
Quite often
Not very often
Not at all

I can enjoy a good book or radio or TV programme:

Often
Sometimes
Not often
Very seldom

Now check that you have answered all the questions

For office use only:

D : ☐ Borderline 8–10

A : ☐ Borderline 8–10

Chronic Urticaria Quality of Life Questionnaire

(CU-Q2oL)

In the last 15 days, how much have you suffered from the following symptoms?

1. Pruritus (itching)

o Not at all o A little o Quite o Quite a lot o Very much

2. Wheals (hives, bumps)

o Not at all o A little o Quite o Quite a lot o Very much

3. Swollen eyes

o Not at all o A little o Quite o Quite a lot o Very much

4. Swollen lips

o Not at all o A little o Quite o Quite a lot o Very much

In the last 15 days, how much has Urticaria interfered with the following daily activities?

5. Work

o Not at all o A little o Quite o Quite a lot o Very much

6. Physical activities

o Not at all o A little o Quite o Quite a lot o Very much

7. Sleep

o Not at all o A little o Quite o Quite a lot o Very much

8. Spare time

o Not at all o A little o Quite o Quite a lot o Very much

9. Social relationships

o Not at all o A little o Quite o Quite a lot o Very much

10. Eating

o Not at all o A little o Quite o Quite a lot o Very much

The following questions are aimed at investigating any problems or difficulties you have experienced (in the last 15 days) which may be related to Urticaria.

11. Do you have difficulties falling asleep?

o Not at all o A little o Quite o Quite a lot o Very much

12. Do you wake up during the night?

o Not at all o A little o Quite o Quite a lot o Very much

13. Do you feel tired during the day because you didn't sleep well at night?

o Not at all o A little o Quite o Quite a lot o Very much

14. Do you have difficulty concentrating?

o Not at all o A little o Quite o Quite a lot o Very much

15. Do you feel nervous?

o Not at all o A little o Quite o Quite a lot o Very much

16. Do you feel down?

o Not at all o A little o Quite o Quite a lot o Very much

17. Do you need to restrict what you eat?

o Not at all o A little o Quite o Quite a lot o Very much

18. Do you feel embarrassed by signs of Urticaria on your body?

o Not at all o A little o Quite o Quite a lot o Very much

Chronic Urticaria Quality of Life Questionnaire (English Translation)

19. Do you feel embarrassed in public places?

o Not at all o A little o Quite o Quite a lot o Very much

20. Do you have problems using cosmetics (such as perfume, body lotion, bath products, make-up)?

o Not at all o A little o Quite o Quite a lot o Very much

21. Does Urticaria limit your choice of clothing?

o Not at all o A little o Quite o Quite a lot o Very much

22. Does Urticaria interfere with your sporting activities?

o Not at all o A little o Quite o Quite a lot o Very much

23. Do you suffer from any side-effects caused by the drugs you take for Urticaria?

o Not at all o A little o Quite o Quite a lot o Very much

Your Health and Well-Being

This survey asks for your views about your health. This information will help keep track of how you feel and how well you are able to do your usual activities.
Thank you for completing this survey!

For each of the following questions, please tick the one box that best describes your answer.

1. In general, would you say your health is:

Excellent	Very good	Good	Fair	Poor
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

2. <u>Compared to one year ago</u>, how would you rate your health in general <u>now</u>?

Much better now than one year ago	Somewhat better now than one year ago	About the same as one year ago	Somewhat worse now than one year ago	Much worse now than one year ago
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

3. The following questions are about activities you might do during a typical day. <u>Does your health now limit</u> you in these activities? If so, how much?

	Yes, limited a lot	Yes, limited a little	No, not limited at all
a <u>Vigorous activities</u>, such as running, lifting heavy objects, participating in strenuous sports	☐ 1	☐ 2	☐ 3
b <u>Moderate activities</u>, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	☐ 1	☐ 2	☐ 3
c Lifting or carrying groceries	☐ 1	☐ 2	☐ 3
d Climbing <u>several</u> flights of stairs	☐ 1	☐ 2	☐ 3
e Climbing <u>one</u> flight of stairs	☐ 1	☐ 2	☐ 3
f Bending, kneeling, or stooping	☐ 1	☐ 2	☐ 3
g Walking <u>more than a mile</u>	☐ 1	☐ 2	☐ 3
h Walking <u>several hundred yards</u>	☐ 1	☐ 2	☐ 3
i Walking <u>one hundred yards</u>	☐ 1	☐ 2	☐ 3
j Bathing or dressing yourself	☐ 1	☐ 2	☐ 3

4. During the <u>past 4 weeks</u>, how much of the time have you had any of the following problems with your work or other regular daily activities <u>as a result of your physical health</u>?

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
a Cut down on the <u>amount of time</u> you spent on work or other activities	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b <u>Accomplished less</u> than you would like	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c Were limited in the <u>kind</u> of work or other activities	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
d Had <u>difficulty</u> performing the work or other activities (for example, it took extra effort)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

5. **During the <u>past 4 weeks</u>, how much of the time have you had any of the following problems with your work or other regular daily activities <u>as a result of any emotional problems</u> (such as feeling depressed or anxious)?**

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
a Cut down on the <u>amount of time</u> you spent on work or other activities	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b <u>Accomplished less</u> than you would like	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c Did work or other activities <u>less carefully than usual</u>	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

6. **During the <u>past 4 weeks</u>, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbours, or groups?**

Not at all	Slightly	Moderately	Quite a bit	Extremely
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

7. **How much <u>bodily</u> pain have you had during the <u>past 4 weeks</u>?**

None	Very mild	Mild	Moderate	Severe	Very severe
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6

8. **During the <u>past 4 weeks</u>, how much did <u>pain</u> interfere with your normal work (including both work outside the home and housework)?**

Not at all	A little bit	Moderately	Quite a bit	Extremely
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

9. **These questions are about how you feel and how things have been with you <u>during the past 4 weeks</u>. For each question, please give the one answer that comes closest to the way you have been feeling. How much of the time <u>during the past 4 weeks</u>...**

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
a Did you feel full of life?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b Have you been very nervous?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c Have you felt so down in the dumps that nothing could cheer you up?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
d Have you felt calm and peaceful?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
e Did you have a lot of energy?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
f Have you felt downhearted and low?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
g Did you feel worn out?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
h Have you been happy?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
i Did you feel tired?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

10. **During the <u>past 4 weeks</u>, how much of the time has your <u>physical health or emotional problems</u> interfered with your social activities (like visiting with friends, relatives, etc.)?**

All of the time	Most of the time	Some of the time	A little of the time	None of the time
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

11. **How TRUE or FALSE is <u>each</u> of the following statements for you?**

	Definitely true	Mostly true	Don't know	Mostly false	Definitely false
a. I seem to get ill more easily than other people	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. I am as healthy as anybody I know	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c. I expect my health to get worse	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
d. My health is excellent	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Thank you for completing these questions!

rial Assessment Chart

Name:

Sheet No:

tions:

eal is > 3cms

	Score	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S
No wheals	0																																			
1-10 small wheals	1																																			
11-50 small OR 1-10 big wheals	2																																			
>50 small OR 11-50 big wheals	3																																			
Almost covered	4																																			
None	0																																			
Mild	1																																			
Moderate	2																																			
Severe	3																																			
cores																																				
Totals																																				
Eyelids																																				
Lips																																				
Tongue																																				
Other sites (eg whole of hands,feet, face or scrotum) Please specify																																				
Other Comments																																				

Guy's and St Thomas' NHS
NHS Foundation Trust

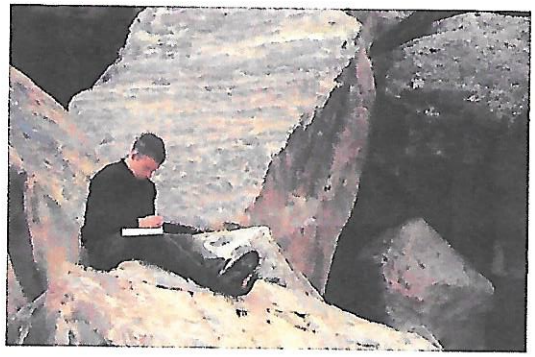
LONDON metropolitan university

Cutaneous Allergy: Urticaria Clinic
St John's Institute of Dermatology

Study Evaluation Questionnaire

Changing Illness & Treatment Perceptions in Chronic Spontaneous Urticaria:

A Pilot Study & Randomised Controlled Trial



This questionnaire provides you with the opportunity to say what you thought about different aspects of the study and consists of 26 multiple choice questions

Please answer all questions by responding with a tick to the answer you agree with.

Only one answer is required for the following questions (1,2,3,5,14,15,16,17,18,19,22,23,24,25,26)

The following questions require all sub-questions to be answered (e.g. 4a, 4b etc) (4,6,7,8,9,10,11,12,13,20,21)

The pack usually takes 7- 10 minutes to complete in one sitting. answers will be confidential. If you find any missing pages please inform the Chief Investigator Delaney Bucknor on 0207-423-0000 (extension 1204) or email d.bucknor@londonmet.ac.uk

To be completed by research staff only: Patient Code No: _____

*1. I was happy with how I was approached about the study?

- Strongly Agree
- Agree
- Neither Agree or Disagree
- Disagree
- Strongly Disagree

*2. It was easy to contact the researcher during working hours to find out more about the trial?

- Strongly Agree
- Agree
- Neither Agree or Disagree
- Disagree
- Strongly Disagree
- Not applicable

*3. I easily understood the explanation of the study provided by the researcher?

- Strongly Agree
- Agree
- Neither Agree or Disagree
- Disagree
- Strongly Disagree

*4. The patient information sheet was comprehensive in terms of

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
a) Improving my knowledge about the purpose of the study					
b) Knowing how to find out further details about the study beyond the patient information sheet					
c) Explaining what will happen to me during the study					
d) Explaining what will happen to my research data and personal information					

Exit this survey

20%

The consent form was easy to understand

- Strongly Agree
- Agree
- Neither Agree or Disagree
- Disagree
- Strongly Disagree

found the instructions for the following questionnaires easy to understand

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
and Your Urticaria Questionnaire					
ess Perception Questionnaire					
efs about Medicines Questionnaire					
OS					
lity of life questionnaire 1					
lity of Life Questionnaire 2- Chronic Urticaria					

nderstood the questions in the following questionnaires

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
and Your Urticaria Questionnaire					
s Perception Questionnaire					
fs about Medicines Questionnaire					
S					
y of life questionnaire 1					
y of Life Questionnaire 2- Chronic Urticaria					

Prev Next

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
e) Providing me with the knowledge of my rights during the course of the study					
f) Knowing about the complaints procedure*					

Further comments

Next

Exit this survey

30%

8. I found the time taken to complete the following questionnaires reasonable

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
You and Your Urticaria Questionnaire					
Illness Perception Questionnaire					
Beliefs about Medicines Questionnaire					
HADS					
Quality of life questionnaire 1					
Quality of Life Questionnaire 2- Chronic Urticaria					

. When using the Urticaria Activity Score I found

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
the instructions easy to understand					
the questions easy to understand					
the time to complete reasonable					

I found the interviews in sessions 1 and 2 excellent in terms of

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
understanding the interview questions					
delivery of the interview questions					
he relevance to my chronic urticaria					
he length of the interview					
verall content of the interview					

her comments

Prev Next

Exit this survey

40%

*11. I found the content/ detail of the following educational information/ advice given to me about the following excellent

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
What CU is and what it CU looks like					
What CU symptoms are					
What the causes of CU are					
Timeline of my CU					
Consequences of my CU					
Emotional responses to my CU					
Control of my CU symptoms (personal and treatment)					

*12. I found the relevance of the educational information/ advice given to me about the following excellent

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
What CU and what it CU looks like					
What CU symptoms are					
What the causes of CU are					
Timeline of my CU					
Consequences of my CU					
Emotional responses to my CU					
Control of my CU symptoms (personal and treatment)					

*13. I found the delivery of the information content/ detail of the following educational information/ advice given to me about the following excellent

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
What CU and what it CU looks like					
What CU symptoms are					
What the causes of CU are					

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
Consequences of my CU	○	○	○	○	○
Emotional responses to my CU	○	○	○	○	○
Control of my CU symptoms (personal and treatment)	○	○	○	○	○

Prev Next

*14. When the researcher did not agree with my views or opinions of my CU, the researcher still respected my right to have a different viewpoint?

- Strongly Agree
- Agree
- Neither Agree or Disagree
- Disagree
- Strongly Disagree
- Not applicable

*15. When creating the action plan I believed that I had an equal role in developing it?

- Strongly Agree
- Agree
- Neither Agree or Disagree
- Disagree
- Strongly Disagree

*16. The action plan was easy to follow and use?

- Strongly Agree
- Agree
- Neither Agree or Disagree
- Disagree
- Strongly Disagree

Further comments

Prev Next

7. I found the action plan useful for managing my CU in the future?

- Strongly Agree
- Agree
- Neither Agree or Disagree
- Disagree
- Strongly Disagree

rther comments

Overall I found the length of time allocated for the 2 sessions excellent?

- Strongly Agree
- Agree
- Neither Agree or Disagree
- Disagree
- Strongly Disagree

would rate the intervention overall as

- Very effective
- Effective
- Neither effective or ineffective
- Ineffective
- Very ineffective

Prev Next

*20. I found the following aspects as the most useful?

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
Doing the intervention in my own home					
Monitoring and recording my severity and intensity of itch					
Completing the questionnaires					
The session Interviews					
Asking about my own personal knowledge of CU					
Challenging my misconceptions of CU					
Providing knowledge about my CU I did not know					
Having to think about ways in which to manage my CU better					
Creating the action plan with the researcher					
Having a follow-up phone-call					

Prev Next

. Overall the intervention

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
s of excellent quality					
s of a good length					
s of a great format					
s well organised					

believe that my knowledge of CU is better due to the intervention

- Strongly Agree
- Agree
- Neither Agree or Disagree
- Disagree
- Strongly Disagree

eel that I now think differently about my CU for the better

- Strongly Agree
- Agree
- Neither Agree or Disagree
- Disagree
- Strongly Disagree

Prev Next

*24. I feel that I am more equipped to think and find solutions for managing my CU

- Strongly Agree
- Agree
- Neither Agree or Disagree
- Disagree
- Strongly Disagree

*25. I feel that I am in a better position to discuss my CU management with my GP

- Strongly Agree
- Agree
- Neither Agree or Disagree
- Disagree
- Strongly Disagree

*26. I feel that I am in a better position to discuss my CU management with my dermatologist

- Strongly Agree
- Agree
- Neither Agree or Disagree
- Disagree
- Strongly Disagree

Prev Next

Appendix 3b

Chronic Urticaria Quality of Life Questionnaire: Translation & Development

Original

Chronic Urticaria Quality of Life Questionnaire (CU-Q_2oL)

Quanto è stato disturbato, durante gli ultimi 15 giorni, dai seguenti sintomi?

Prurito

Per niente o Poco o Abbastanza o Molto o Moltissimo

Pomfi

Per niente o Poco o Abbastanza o Molto o Moltissimo

Gonfiore agli occhi

Per niente o Poco o Abbastanza o Molto o Moltissimo

Gonfiore alle labbra

Per niente o Poco o Abbastanza o Molto o Moltissimo

Indichi se l'orticaria, negli ultimi 15 giorni, l'ha limitata nei seguenti ambiti della vita quotidiana

Lavoro

Per niente o Poco o Abbastanza o Molto o Moltissimo

Attività fisica

Per niente o Poco o Abbastanza o Molto o Moltissimo

Sonno

Per niente o Poco o Abbastanza o Molto o Moltissimo

8 Tempo libero

o Per niente o Poco o Abbastanza o Molto o Moltissimo

9 Relazioni sociali

o Per niente o Poco o Abbastanza o Molto o Moltissimo

10 Alimentazione

o Per niente o Poco o Abbastanza o Molto o Moltissimo

Con le seguenti domande vogliamo approfondire le difficoltà ed i problemi che possono essere legati all'orticaria (riferiti agli ultimi 15 giorni)

11 Ha difficoltà ad addormentarsi?

o Per niente o Poco o Abbastanza o Molto o Moltissimo

12 Si risveglia durante la notte?

o Per niente o Poco o Abbastanza o Molto o Moltissimo

13 Durante il giorno è stanco perché la notte non riposa bene?

o Per niente o Poco o Abbastanza o Molto o Moltissimo

14 Ha difficoltà a concentrarsi?

o Per niente o Poco o Abbastanza o Molto o Moltissimo

15 Si sente nervoso?

o Per niente o Poco o Abbastanza o Molto o Moltissimo

16 Si sente giù di morale?

o Per niente o Poco o Abbastanza o Molto o Moltissimo

17 Si deve limitare nella scelta dei cibi?

o Per niente o Poco o Abbastanza o Molto o Moltissimo

8 La imbarazzano i segni che, a causa dell'orticaria, compaiono sul suo corpo?

Per niente o Poco o Abbastanza o Molto o Moltissimo

9 E' imbarazzato a frequentare locali pubblici?

Per niente o Poco o Abbastanza o Molto o Moltissimo

0 E' un problema per Lei utilizzare cosmetici (es. profumi, creme, lozioni agnoschiuma, trucchi)?

Per niente o Poco o Abbastanza o Molto o Moltissimo

1 E' condizionato nella scelta dei vestiti?

Per niente o Poco o Abbastanza o Molto o Moltissimo

2 Limita la sua attività sportiva a causa dell'orticaria?

Per niente o Poco o Abbastanza o Molto o Moltissimo

3 E' disturbato dagli effetti collaterali dei farmaci assunti per l'orticaria?

Per niente o Poco o Abbastanza o Molto o Moltissimo

1/6 draft Forward

Marinella.

Chronic Urticaria Quality of Life Questionnaire (CU-Q_2oL)

Tense: - present perfect ✓
continuity of format ie.
During/in the last 15 days .....

Numbering.

(1) **In the last 15 days, how much have you noticed (suffered from?) any of the following symptoms?**

1 Itchiness

o At all o Little o Quite o Very o Very much

2 Itchy red swellings

o At all o Little o Quite o Very o Very much

3 Eye puffiness

o At all o Little o Quite o Very o Very much

4Puffy lips

o At all o Little o Quite o Very o Very much

(2) **Indicate if, in the past 15 days, urticaria has affected any of the following daily activities**

5 Working

o At all o Little o Quite o Very o Very much

6 Physical activity

o At all o Little o Quite o Very o Very much

7 Sleep

o At all o Little o Quite o Very o Very much

8 Freetime Spare time

o At all o Little o Quite o Very o Very much

1st draft forward ~~Claudia~~ / Marinella

9 Social relationships

o At all o Little o Quite o Very o Very much

10 Diet @ Appetite ?

o At all o Little o Quite o Very o Very much

The following questions are aimed to investigate difficulties and problems which can be linked to urticaria (in the last 15 days)

11 Do you have difficulty falling asleep?

o At all o Little o Quite o Very o Very much

12 Do you wake up during the night?

o At all o Little o Quite o Very o Very much

13 During the day, do you feel tired because of the fact that you do not sleep well at night?

o At all o Little o Quite o Very o Very much

difficulty concentrating

14 Do you have concentration difficulties?

o At all o Little o Quite o Very o Very much

15 Are you irritable? - Claudia "nervous" Which?

o At all o Little o Quite o Very o Very much

16 Are you in low spirits? / depressed ?

o At all o Little o Quite o Very o Very much

17 Do you have to select what you eat? See Claudia's - rather diff.

o At all o Little o Quite o Very o Very much

18 Do you feel uncomfortable with the ~~body~~ marks that urticaria leaves on you? - body compare w/ C.

o At all o Little o Quite o Very o Very much

1st draft forward Marinella

about going out in public

19 Do you feel uncomfortable when you are in public places?

o At all o Little o Quite o Very o Very much

20 Does the use of cosmetics bother you (EG- perfumes, creams, lotions, ~~bath foam~~, make-up)? body bubble

o At all o Little o Quite o Very o Very much

be careful what you wear ?

21 Do you have to select what to wear?

o At all o Little o Quite o Very o Very much

22 Does urticaria reduce your physical activity?

o At all o Little o Quite o Very o Very much

side effects ?

23 Do you have adverse reactions associated with the use of the drugs ~~you take to cure~~ for urticaria? you take

o At all o Little o Quite o Very o Very much

---

o Strongly disagree o Disagree o Undecided o Agree o Strongly agree

Ab draft forward

Claudia

Chronic Urticaria Quality of Life Questionnaire

(CU-Q_2oL)

During the last 15 days how much did you suffer from the following symptoms:

1 Itching

o Not at all o A little o Pretty much o Quite a lot o Very much

2 Itchy red swelling

o Not at all o A little o Pretty much o Quite a lot o Very much

swollen eyes

3 Eye swelling

o Not at all o A little o Pretty much o Quite a lot o Very much

swollen lips

4Lip swelling

o Not at all o A little o Pretty much o Quite a lot o Very much

during the last 15 days

Did the Urticaria prevented you from doing the following things in everyday life?

5 Working

o Not at all o A little o Pretty much o Quite a lot o Very much

6 Physical activities

o Not at all o A little o Pretty much o Quite a lot o Very much

7 Sleeping

o Not at all o A little o Pretty much o Quite a lot o Very much

8 Spare time

o Not at all o A little o Pretty much o Quite a lot o Very much

9 Social relationships

o Not at all o A little o Pretty much o Quite a lot o Very much

10 Eating

o Not at all o A little o Pretty much o Quite a lot o Very much

(1)

With the following questions we would like to investigate problems and troubles that may be related to Urticaria (concerning the last 15 days)

11 Do you have problems in falling asleep?

o Not at all o A little o Pretty much o Quite a lot o Very much

12 Do you wake up during the night?

o Not at all o A little o Pretty much o Quite a lot o Very much

13 Are you tired during the day because you cannot rest properly during the night?

o Not at all o A little o Pretty much o Quite a lot o Very much

14 Have you problems in concentrating on things?

o Not at all o A little o Pretty much o Quite a lot o Very much

15 Do you feel nervous?

o Not at all o A little o Pretty much o Quite a lot o Very much

16 Do you feel down?

o Not at all o A little o Pretty much o Quite a lot o Very much

17 Do you have to cut back on eating?

o Not at all o A little o Pretty much o Quite a lot o Very much

18 Do you feel embarrassed by the marks on your body?

o Not at all o A little o Pretty much o Quite a lot o Very much

19 Do you feel uncomfortable to go out in public places?

o Not at all o A little o Pretty much o Quite a lot o Very much

20 Is it a problem for you to use cosmetics (such as perfumes, lotions, bath foams, make up cosmetics)?

o Not at all o A little o Pretty much o Quite a lot o Very much

21 Does Urticaria influence you when it comes to choose clothes?

o Not at all o A little o Pretty much o Quite a lot o Very much

22 Does Urticaria influence your sport activity ?

o Not at all o A little o Pretty much o Quite a lot o Very much

23 Are you upset by the side-effect produced by drugs you take for Urticaria

o Not at all o A little o Pretty much o Quite a lot o Very much

Back translation

Questionario sull' orticaria cronica e la sua incidenza sulla qualità della vita

(CU-Q_2oL)

Negli ultimi 15 giorni, quanto ha sofferto dei seguenti sintomi?

1. Pruriti

o Per nulla o moderatamente o abbastanza o molto o moltissimo

2. Lividi (punture, gonfiori)

o Per nulla o moderatamente o abbastanza o molto o moltissimo

2. Gonfiore agli occhi

o Per nulla o moderatamente o abbastanza o molto o moltissimo

4. Gonfiore delle labbra

o Per nulla o moderatamente o abbastanza o molto o moltissimo

Negli ultimi 15 giorni, quanto l'orticaria ha interferito con le seguenti sue attività quotidiane?

5. Attività lavorativa

o Per nulla o moderatamente o abbastanza o molto o moltissimo

6. Esercizio fisico

o Per nulla o moderatamente o abbastanza o molto o moltissimo

7. Sonno

o Per nulla o moderatamente o abbastanza o molto o moltissimo

8. Tempo libero

o Per nulla o moderatamente o abbastanza o molto o moltissimo

9. Relazioni sociali

o Per nulla o moderatamente o abbastanza o molto o moltissimo

10. Abitudini alimentari

o Per nulla o moderatamente o abbastanza o molto o moltissimo

Le domande che seguono si propongono di investigare problemi o difficoltà, riscontrati negli ultimi 15 giorni, che si possano ricondurre all'orticaria.

11. Ha difficoltà nell' addormentarsi?

o Per nulla o moderatamente o abbastanza o molto o moltissimo

12. Si sveglia durante la notte?

o Per nulla o moderatamente o abbastanza o molto o moltissimo

13. Prova stanchezza durante il giorno perchè non ha dormito bene la notte?

o Per nulla o moderatamente o abbastanza o molto o moltissimo

14. Ha difficoltà a concentrarsi?

o Per nulla o moderatamente o abbastanza o molto o moltissimo

15. Si sente nervoso?

o Per nulla o moderatamente o abbastanza o molto o moltissimo

16. Si sente giù di morale?

o Per nulla o moderatamente o abbastanza o molto o moltissimo

17. Deve limitarsi nell' alimentazione?

o Per nulla o moderatamente o abbastanza o molto o moltissimo

18. Prova imbarazzo per i segni dell'orticaria sul suo corpo.

o Per nulla o moderatamente o abbastanza o molto o moltissimo

19. Prova imbarazzo in luoghi pubblici?

o Per nulla o moderatamente o abbastanza o molto o moltissimo

20. Ha riscontrato alcun problema nell' uso di prodotti cosmetici (profumi, lozioni per il corpo, prodotti igenici, trucchi)?

o Per nulla o moderatamente o abbastanza o molto o moltissimo

21. L'orticaria la limita nelle scelte di abbigliamento?

o Per nulla o moderatamente o abbastanza o molto o moltissimo

22. L'orticaria pregiudica la sua vita sportiva?

o Per nulla o moderatamente o abbastanza o molto o moltissimo

23. Soffre di effetti collaterali provocati dai medicamenti per l'orticaria?

o Per nulla o moderatamente o abbastanza o molto o moltissimo

Combined Version 1st draft
- Delaney - Anna
- Marinella
- Sarah

Chronic Urticaria Quality of Life Questionnaire

(CU-Q_2oL)

how much have you suffered

n the last 15 days, to what extent have you suffered from the following symptoms?

Pruritus (itching)

Not at all o A little o Neither not at all nor a lot o Quite a lot o A lot

Wheals (hives, bumps)

Not at all o A little o Neither not at all nor a lot o Quite a lot o A lot

Swollen eyes

Not at all o A little o Neither not at all nor a lot o Quite a lot o A lot

Swollen lips

Not at all o A little o Neither not at all nor a lot o Quite a lot o A lot

how often

the last 15 days, to what extent has Urticaria interfered with the following daily
ctivities?

Work

Not at all o A little o Neither not at all nor a lot o Quite a lot o A lot

Physical activities

Not at all o A little o Neither not at all nor a lot o Quite a lot o A lot

Combined Version

7. Sleep

o Not at all o A little o Neither not at all nor a lot o Quite a lot o A lot

Free time
8. ~~Spare time~~

o Not at all o A little o Neither not at all nor a lot o Quite a lot o A lot

9. Social relationships

o Not at all o A little o Neither not at all nor a lot o Quite a lot o A lot

10. Eating ~~behaviour~~

o Not at all o A little o Neither not at all nor a lot o Quite a lot o A lot

The following questions are aimed at investigating any problems or difficulties you have experienced (in the last 15 days) which may be related to Urticaria.

11. Do you have ~~problems~~ difficulties falling asleep?

o Not at all o A little o Neither not at all nor a lot o Quite a lot o A lot

12. Do you wake up during the night?

o Not at all o A little o Neither not at all nor a lot o Quite a lot o A lot

13. Do you feel tired during the day because you didn't sleep ~~badly~~ well at night?

o Not at all o A little o Neither not at all nor a lot o Quite a lot o A lot

14. Do you have difficulty concentrating?

o Not at all o A little o Neither not at all nor a lot o Quite a lot o A lot

15. Do you feel ~~irritable~~ nervous?

o Not at all o A little o Neither not at all nor a lot o Quite a lot o A lot

16. Do you feel depressed?

o Not at all o A little o Neither not at all nor a lot o Quite a lot o A lot

17. Do you need to restrict what you eat?

o Not at all o A little o Neither not at all nor a lot o Quite a lot o A lot

18. Do you feel embarrassed by the signs of Urticaria on your body?

o Not at all o A little o Neither not at all nor a lot o Quite a lot o A lot

19. Do you feel uncomfortable in public places?

o Not at all o A little o Neither not at all nor a lot o Quite a lot o A lot

20. Do you have problems using cosmetics (such as perfume, body lotion, bath products, make-up)?

o Not at all o A little o Neither not at all nor a lot o Quite a lot o A lot

21. Does Urticaria ~~influence~~ your choice of clothing?

o Not at all o A little o Neither not at all nor a lot o Quite a lot o A lot

Combined version

22. Does Urticaria interfere with your sporting activities?

o Not at all o A little o Neither not at all nor a lot o Quite a lot o A lot

23. Do you suffer from any side-effects caused by the drugs you take for Urticaria?

o Not at all o A little o Neither not at all nor a lot o Quite a lot o A lot

Appendix 4

Interpretive Phenomenological Analysis Documents- Study 5

Common Sense Interview

Interpretive Phenomenological Analysis Version

Illness Identity

1. a) I'm interested in what you call your condition. What is your name for this condition?
   Probe: How did you come to that name?

   b) Do you consider CU to be an illness and why?

   c) Can you tell me about your chronic urticaria related symptoms?
   Prompt: describe symptoms, physical feelings and sensations?

Illness Coherence

2. a) When did you first become aware about a condition named chronic urticaria?

   b) Can you tell me what you know about chronic urticaria?
   Prompt: definition in own words, what it actually is?

   c) In your own words, what do you think is happening to you inside physically when you are experiencing symptoms of chronic urticaria?

   d) How did you come to acquire your current knowledge and understanding of the condition after diagnosis? Prompt: Where or whom did they come from?

Casual Attributions

3. I am interested in what you believe is causing your chronic urticaria. What do you believe is causing you chronic urticaria?
   Probe: I am interested in how you came to these beliefs AND/ OR most likely cause?

Timeline-acute/ chronic and Cyclical

4. Some believe that their CU is short-term, others long-term. Some believe that their CU will come and go over time. What is your personal view on this?

Consequences

5. Patients often report the consequences of chronic urticaria on their lives. In what ways would you say it has affected your life? *Prompt: Yourself- physically, psychologically, and socially? Significant others? Family*

Cure/ personal and treatment control

6. Do you regard chronic urticaria as something you have control over?
   Probe: If yes: What things do you currently do you currently do to control your symptoms?
   Probe: If no: How did you come to hold this view?

7. Individuals with chronic urticaria have diverse opinions on the effectiveness of chronic urticaria medicines to control their symptoms. What are your views on such medications to control your symptoms? Probe: What experiences of using chronic urticaria medicines has led you to this conclusion?

8. Do you believe that there will ever be a cure for chronic urticaria?
   Probe: Why do you believe this is so?

Specific necessity and concerns

9. From your own personal experiences in what ways do you see chronic urticaria medicines as a necessity in managing you symptoms?

10. I'm interested in your concerns about chronic urticaria medicines. What are your concerns about these medicines?
    Probe: How did you come to form these opinions?
    Probe: What are your beliefs about medicines in general?

Emotional Representations

11. Patients often report that chronic urticaria can have an emotional impact on their lives. How does chronic urticaria affect you emotionally? Prompt: How does it make you feel? What words come to mind?

Coping

12. What strategies do you use in order to cope with your chronic urticaria symptoms on a daily basis? Prompt: thoughts, behaviour

Other

13. Is there anything else you would like to talk about that I have missed?
    Probe: I would like to know more about that.

Appendix 4

Interpretive Phenomenological Analysis Transcript Example

Transcript of first case

Karen: Female patient with chronic autoimmune urticaria aged 50 years, disease-duration of 21 years

Interview undertaken in participants own home (20.07 minutes duration)

Key: R Researcher, **K** Karen

01	R: Okay erm first question, erm I am interested in what you call your condition	
02	K: Erm I call it urticaria erm but I know that its autoimmune spontaneous urticaria I know	
03	that's what it is but if I refer to, when I speak to people who don't know I just tell them it's	
04	allergies because I can't be bothered to explain it but for myself its urticaria.	
05	R: Okay. Do you consider chronic urticaria to be an illness?	
06	P: When I'm ill with it when it's not but like; now I'm in remission; so I don't think about it but	
07	when I actually got it, I find it debilitating and so yes I do	
08	R: Okay that's fine, erm can you tell me about your urticaria related symptoms	
09	K: Erm, hives which can be on any part of my body and erm and angioedema whereby my	
10	lips and my eyes all swell up as well and usually happens funnily enough it's kind of two	
11	parts of the day generally in the morning then I might get a break from it during the day and	
12	then it will always comes back in the evening	
13	R: Okay any kind of like sensations or....	
14	K: ...yeah I can feel it coming on, it feels tingly, knows it's coming can feel it you know	
15	coming up in a part of my skin, erm also if I if I see a bit of skin when it is out of my system I	
16	might scratch my skin with my nail it will mean red if you know what I mean that mark will	
17	not go away	
18	R: Okay that's fine erm when did you first become aware of a condition called chronic	
19	urticaria?	
20	K: Not until I got my diagnosis erm I mean I've had it erm , I'm 50 now and I've had it since I	
21	was 29 but for many many years I thought it was allergies so I was probably diagnosed, I'm	
22	not sure 5 or 6 years ago was when I actually finally was diagnosed with the condition,	
23	that's when I first heard of it.	
24	R: Okay, who diagnosed you?	
25	K: Dr [doctors name] at St Thomas' hospital	
26	R: Okay so your consult dermatologist not your GP	
27	K: no, no, yeah [both laugh]	
28	R: Okay that's fine. Erm can you tell me what you know about chronic urticaria, kind of like	
29	define it in your own words? Your definition	
30	K: How I would define it is my own erm immune system if you like produces too much	
31	histamine and it's my own immune system that's erm attacking me that's how I see it, it's	
32	my own body attacking me and I'm not sure really what triggers that but what's happening	
33	when it's happening.	
34	R: Okay that's fine. In your own words what do you think is happening inside you physically	
35	when you are experiencing an episode of chronic urticaria?	
36	K: In my own words I would say erm..[pause 2 seconds] I would think that really there's this	
37	swelling going on and I don't really know what's happening. My blood I guess is too much	
38	histamine being produced which is causing these erm these welts and wheals in my skin	
39	really. That's how I see it.	
40	R: That's absolutely fine yes [Karen leaves table to make coffee] Do you want to pause?	
41	K: It up to you Delaney	
42	R: Okay I'll carry on.	
43	K: Okay	
44	R: Okay erm. I'm interested in what is causing your urticaria	
45	K: I think it that my body produces too much histamine and I think it's also linked to having	
46	an underactive thyroid that's what I believe, that's what I've been told erm but erm my	
47	underactive thyroid is under-controlled, think I'm one of the lucky patients who haven't had I	
48	mean, I take thyroxin and generally its well controlled but never-the less it is apparently they	
49	call me in to as one of those who have an underactive thyroid, that's what I believe	
50	R: Okay that's fine, next question erm some people believe that there chronic urticaria is	
51	short term, others believe its long term, some believe that their CU will come and go in	
52	cycles. What is your personal view?	
53	P: Believe that unfortunately its' long-term and that it's not with me all the time so yes it's	
54	cyclical, yeah	
55	R: Okay	
56	P: But I don't know what the triggers are.	
57	R: Okay, erm. patient's often report the consequences of chronic urticaria on their lives. In	
58	what way would you say chronic urticaria has affected your life?	
59	K: Erm it's made me become more health conscious, I don't drink alcohol at all for fear of	
60	triggering it, I erm, I still exercise but I am much more conscious of not exercising enough or	
61	too hard. I have a very healthy diet but then I always did have. I'm a vegetarian erm so I'm	
62	veggie, I... I... really I'm very conscious of my health if I'm honest because although it is not	
63	the most serious illness in the world, when it is with you and it's got its grip on you its	
64	debilitating and I hate with a passion all the medication and I would do anything in my power	
65	to resist having to take them. I feel strongly about that. I don't think I'm popular at the	
66	hospital because I refuse to take the methotrexate, partly my mother was a very ill women	
67	and I watched her for fifteen years of her life on medications and all the side effects and the	
68	symptoms none of them seemed to benefit her greatly and just don't want to be that person,	
69	it must sound really dramatic [laughs]	
70	R: Yeah, that's fair enough [both laugh] so is there anywhere were chronic urticaria affects	

you psychologically or socially?

K: Only like, right now it barely I generally don't think about it, when it's with me erm you know if I've got the angioedema in my face for example that doesn't calm down for days and yeah and when I'm out and about I think, I feel self-conscious, I think people must be looking and thinking what's wrong with her and I couldn't walk the street I should explain it but you know I don't.

R: When the urticaria is bad does it affect significant others and family?

K: Oh yeah it stresses my husband out and my daughters are oblivious, they are not two bothered erm [3 second pause] probably, probably my husband, cause probably I'm more tired because you know you don't often sleep well with it, I'm probably a bit more grumpy and probably yeah I feel a failure because I'm not the person I usually when it's with me and erm I'm different, not totally different yeah I mean I get on with my life I would do everything I would normally do but your waking up and you just feel miserable. You feel itchy, you feel hot, your all swollen, it's not nice

R: Yeah [Both participant and interviewer laugh in agreement]

K: Oh you say yes because you agree with me yes [laughing]

R: Totally agree with you from my own experience, yeah

K: Yeah

R: Okay erm, do you regard chronic urticaria as something you have control over?, that's when you are actually experiencing symptoms

K: No I don't have any control over it' What triggers it and I'm told that the triggers are and told about at times I try to avoid but when it's with me it's in control and that the only thing I can do to get a reprieve from it is to take steroids and I hate taking steroids, I hate the steroids makes me feel agitated and puffy and sore and swollen and unwell so no I think it controls me when it's with me

R: Okay have you ever tried anything else that you've tried.....

K:... yes

R: Medications?

K: Oh have I yes well medications I've tried like cyclosporine [difficultly pronouncing] and that didn't work. Erm the only other thing I did was the last time that was quite bad I went on the diet that they gave me and I found it quite difficult because what I did find was that a lot of the things they say you shouldn't eat like for example tomatoes and stuff are in my diet a lot so when it was bad last time I tried to stick to the diet and I found it very difficult but I did it and I think it may have helped but I couldn't be sure be course it was coming to the end of its cycle so I don't know but now that I'm in remission I still, I just have my diet according to my things that they say you shouldn't have and touch food I'm okay, so I don't know that's the only other thing that I've tried... do you want some cake.

R: Yes please

K: Erm the issue with food and erm allergens is that they don't cause urticaria...it exacerbates it when its already there

R: Absolutely

K: Erm milk and sugar Delaney. Help yourself

R: Okay thank you [pause while both make coffee at table 12 seconds] Okay. Erm individuals with chronic urticaria have diverse opinions on the effectiveness of chronic urticaria medicines to control their symptoms

K: Yep

R: Erm, you've told me a little bit already

K: Yep

R: But what are your views on chronic urticaria medications?

K: Erm haven't found any that have worked for me erm don't like any of the medications I have taken always have not felt well when I'm on them. The only thing I take with any, all of the time was fexofenidine which is the prescription anti-histamine and I don't think I could live without that, that really helps me I think

R: Okay

K: It's my belief that it helps me and I wouldn't go anywhere without it. And I take that and I take one called singlarer which I'm told works in synergy with the fenofexadine and it is my belief that if that's what keeps it at bay and erm and then I take that when I'm in remission

R: Okay

K: Erm but then it gets flares up and is really bad then there isn't anything that I like and only thing that can give reprieve as I said is the steroids. and I hate, try to resist taking them as much as I can.

R: And they cannot be taken long term

K: And they cannot be taken long term... and you know the doctors have said to me that I won't be preferable to go on something like the methotrexate and rather than having short sharp bursts of the erm steroid because that's not good for me that may bones and so but my view is that I would rather have the short sharp bursts of than be on a long-term medication and I absolutely stand by that I don't want to pump my body full of chemicals.

R: Okay erm do you believe that there will ever be a cure for chronic urticaria?

K: No

R: No....what has leaded you to believe that?

K: Erm well I've had it now for twenty something years and you now that the hospital, their wonderful but I've never been lead to believe that, never been given an indication that there is a likely cure. My belief is that it probably erm I don't know that's but I'm guessing that it does not get as much money on research and stuff because it not life threatening necessarily and so my guess is not so much money spent on it erm so I don't think that there will be a cure, not in my lifetime. [lower tone] I don't think so sadly.....I wish there was

R: Oh okay, we've touched on this already, erm do you think chronic urticaria medicines are a necessity in managing you symptoms?

K: Yeah well like definitely the anti-histamines, I mean if that counts as a chronic urticaria medicine I don't know but that what they've given me fenofexadine yes I think that essential.

[The other stuff [pause] no you know I don't they haven't helped me the cyclosporine I say is a very strong drug and it didn't help me but that's my own experience the doctors tell me are people it has helped and the urticaria has gone away forever and I wasn't that person sadly so therefore I would have to say no

R: Okay, erm are you concerned about chronic urticaria medications. We've kind of touched on that a little bit

K: Errmmm yeah, only in that [emphasised] if you know I kind of don't want to take them because I don't believe their going to work for me erm so I might take cyclosporine for a while and maybe my symptoms may will be alleviated but I know at some point it's going to come back so that's why I have taken a view of anti-histamines and the short sharp bursts of steroids which I don't think the doctors agree with me and they know what they are talking about but it's my body and that's what I choose to do.

R: Okay [both laugh]

K: That's fine

R: Erm, people often think that chronic urticaria has very emotional impact on their life.

K: Mmm

R: Would you say that chronic urticaria affects you emotionally?

K: Only when it's in my system I think definitely don't feel the same I'm a bit down erm I feel more tired, and erm just have less energy and yeah I feel a bit down so yes it does affect me emotionally, yep but when it's not with me for months like now then I'm I don't think about it. I not thinking everyday it's coming I generally just don't think about it but it's just, in fact I kind of always make a point of not thinking about it cause I don't want to tempt fate

R: Okay that's a good answer

[both laugh]

R: When you are actually are experiencing symptoms and your feeling emotional about it what kind of words would come to mind to describe the emotions?

K: fed up erm frustrated itchy hot erm tired really erm yeah just really fed up when it's with me to be honest yeah really fed up because you know, if you're in a social situation and your bodies covered in hives and you don't just sit and scratch cause that but it's just the most itchy thing in the world and erm so uncomfortable erm definitely self-conscious yeah

R: Okay [sympathetically]

K: [laughs] I do [laughs again]

R: when you are experiencing symptoms what strategies do you use in order to cope?

K: mm very diligent about when I take my medication. I try to take it at exactly the same times each day erm wear nothing tight even the elastics in my socks, if there tight then that really rubs so if I'm going anywhere I try and make sure that all my clothes are very loose and I don't wear tight jeans or erm I would do that I would make sure that my bedding is like of cool cotton sheets because heat keeps acerbates it and makes it worse erm and what else would I do I think there's a limit to what I can do. I must say I have cold creams, I don't find the creams effective I might get a bit of short reprieve with but I've never found a cream that will take it away or even take the itch away over a period length of time so if you do know of one please tell me because I have not managed to find one yet

R: What creams have you used?

K: Oh gosh I can't remember I think at the time just using a different cream any cream that's on the market actually. I've never been prescribed the cream erm I've only ever just bought creams over the counter...I've never found them to be that effective

R: Okay, hydrocortisone?

K: I tried that yeah and you get a short term reprieve, you know if its burning regularly on my legs a lot and when my legs are really itchy I scratch and then my husband says stop scratching but you know I can't help it so hot and then I put the cream on and then I will get a bit of reprieve but not forever just a wee while

R: yeah

K: maybe for a short time I'll stop itching, yeah, yeah yeah but I can see if must drive people mad, there's nothing worse than sitting beside someone scratching away it gives you the heebie-jeebies doesn't it [heckles and laughs out loud]

R: Ok erm apart from your behaviours in order to coping with your chronic urticaria do you go through any kind of thought processes to help manage?

K: Not really I mean I, yeah I've tried to think very positively like now I'm in remission I so just try and feel healthy and I'm feeling good so I try and just live, I'm conscious of it, I know I get quite debilated it makes me so I do generally appreciate when I I've got, I do try to live a healthy lifestyle, as I said I don't have any alcohol at all erm even for my fiftieth birthday I didn't drink I was frightened of triggering it erm so my thought process is to think positively, and just give myself the best shot of it not coming back. One of the things they say triggers it is stress. It's very difficult to avoid stress in your life but when I am stressed its erm very very aware that I might be causing it to come back. The other thing I don't ever do which is a change in my life style never sunbathe, I used to sunbathe a lot, I used to go abroad on holiday to sunny beaches and lay on the beach, never, ever sit in the sun now [emphasised] because I believe that my last onset was by me laying in the sun. Dr Grattan says he doesn't think it was that but I absolutely believe that's what triggered it so I don't sit in the sun at all. I have a big hat I ware in the garden, I just don't sunbathe. I won't go out in the sun erm or walk about but I just don't like sunbathing time to get a tan I given up on that completely

R: Yeah

K: Yeah [laughs]

R: Okay, is there anything else that you would like to talk about that might have been missed?

K: Erm, is there anything else?

R: Anything what's so ever?

K: Erm, let me think [pause] I don't know I'd be interested to know whether there are studies on it and whether there is likely to be a cure. Do you know anymore than I do giving you

231 have a and at the clinic
232 **R:** Erm, yes I can talk about that
233 **K:** Can you yeah I mean if you, I would like to know that and also what they are doing, erm
234 and the other thing I find very frustrating about it is that because it's one of these illnesses if
235 you like which goes into remission so you have months of not getting it then one of the last
236 times it happened to me it came back very very suddenly I it was worse than ever and I had
237 no medication at that point and I was quite new to St Thomas' hospital so I phoned erm [
238 *consultants name*] secretary to try and get in and he said, and I found him really unhelpful
239 and erm he couldn't, I couldn't be seen for weeks and weeks and I was trying to explain to
240 this chap 'look I can't wait for weeks and weeks I need help and needed to speak to
241 someone and that that really, that was the worst, that was my lowest point because here is
242 a man who is secretary to the man I needed to see who I didn't think understood what I was
243 talking about and I felt very much on my own at that point because the GP's there isn't really
244 anything they can do about it and erm and I was really worried and I think that was one of
245 the time I really cried about it because I had nothing I didn't have the anti-histamines at that
246 point I didn't have the steroids I just needed help and I did say to the doctors about that that
247 given the nature of this illness they have to have a system whereby if suddenly you have a
248 flare-up and you feel you need help you need to be able to just get into that clinic without a
249 whole series of very very stressful phone-calls and that that that really upset me.
251 **R:** How long ago was that?
252 **K:** That was a couple of years ago to be fair
253 **R:** Right
254 **K:** But I think that I cannot believe that I have been the only person to have experienced
255 that, that really stressed me out cause I thought oh my God what more can they do,
256 because it was really bad then erm and when I got to the hospital they were brilliant. One of
257 the Professors there, the older man I can't remember his name
258 **R:** Professor [professor's *name*]
259 **K:** Yeah, he's given me a letter that says if that ever happens to me again you can turn up
260 at our Thursday morning clinic but I've never done that but if it really was bad I would now
261 do that but I did not know that then
262 **R:** Okay, thank you I'm going to stop the interview

Karen K

Mine verses others identity/ understanding of a rare condition
Healthy verses ill me
Predictability verses unpredictability (Split presentation of illness)
Illness as a separate entity invading and over taking over
Vivid experiences of concrete symptoms and sensations
Effects on appearance
Parallell processing (linking symptoms to labels) 20
Body attacking self
Understanding CU 31, 37
Loss of control over self
It will go but it will come back
Uncertainty
Fear of reoccurrence verses avoidance
Fear
CU medications as a health threat
Overuse of medicines by doctors
Uncertainty of outcome
Social messages
Social consequences of appearance
Self-conscious
Shame
Self-blame
Medications are ineffective
Necessity verses concerns of medicines
Frustration
Fed-up
Fear of exposure
Strategies that help are limited
Judgement
Communication
Need for knowledge
Access/ barriers to help
Comparison with others
Understanding services
Burden of disease label

IPA Interview 2

Hanna: Female patient with chronic idiopathic urticaria aged 45 years, disease-duration of 32 years

Interview undertaken in participants own home (15.07 minutes duration)

Key: R Researcher, **H** Hanna

	01	**R:** Okay, the first question I'm going to ask you is I am interested in what do you call
	02	your condition.
	03	**H:** Erm what I call it?
	04	**R:** Yes what would you call it in your own words?
	05	**H:** I, urticaria. That's what I call it yeah.
	06	**R:** Okay how did you come to that name?
isdiagnosis	07	**H:** Only after going to see many erm doctors because originally it was classed as an
	08	allergy so I went to all the allergy clinics and had all the tests and stuff so for ages it was
ming for a	09	just allergy and then it was diagnosed as urticaria eventually but it took a while erm so
agnosis	10	once I knew what it was why I call it that.
	11	**R:** Okay yes that's fine. Do you consider your urticaria to be an illness?
efining illness vs	12	**H:**Erm, no not really, no not an illness, no because it doesn't make me feel ill but you
ondition	13	know it's, it's a condition I would call it rather than an illness
	14	**R:** Okay that's fine, erm can you tell me more about your chronic urticaria symptoms?
	15	**H:** Erm I get big hives on my skin, erm mm, my hands my feet will swell up so that I can't
	16	bend my fingers you know their so swollen. I get it in my joints particularly on my elbows
	17	and that's really painful. I can get it in my mouth, in my eyes, in my throat or just justjust
ymptoms random	18	hives on my skin so it's it'srandom
	19	**R:** Any physical symptoms or sensations to describe?
	20	**H:** Well you know when you get it on your feet if you put pressure you feel a bit
	21	nauseous as it's so swollen and tight my skin feels so tight erm but by the night it's
	22	either very itchy or very painful it's in my joints, it really hurts erm but no not not any
	23	other sort of symptoms at all now.
agnosis decades	24	**R:** Okay that's absolutely fine. Okay next erm where did you first become aware of a
er symptoms start	25	condition called chronic urticaria?
	26	**H:** Probably about five years ago. I think I've had it, I've had it since I was thirteen when
	27	I first had it and again everyone said it was allergies, allergy allergy, yeah
	28	**R:** Okay, erm in your own words what do you think is happening physically inside your
knowledge	29	body when you are experiencing symptoms.
stamine	30	**H:** I, I don't really quite understand it but I assume that like an allergy your bodies
	31	reacting to something but I don't quite know what I can only think of it like an allergy like
	32	you would get like you know hive like you if you were allergic to itching powder your skin

	33	might get a rash and that's your bodies it's the histamine I think is it reacting and i'm not
	34	that's the way I think of it but I don't actually know.
	35	**R:** Okay that's interesting. How did you come to acquire your current knowledge about
	36	urticaria, you already said that you don't really know....
	37	**H:**yeah cause there's not a lot, there isn't a massive amount out there but when I was
	38	told what it was I sort of did a bit of research online but that's about it but there isn't a
	39	huge amount to find out really. I think all erm certainly not for sort of like me there might
	40	be for medical professionals but I don't really understand that so there's not a lot for just
	41	me.
	42	**R:**Okay in what way do you not understand?
	43	**H:** Like the previous question I don't really know why it happens I don't know what
	44	causes it I don't know what I can do to avoid it I you know I don't know why I had it in the
Stress/ random	45	first place, if it's genetic or I don't, I, I don't know where it comes from so I would like to
	46	know if it's, if it's sort of genetic then I'd stop wondering if I can do about it, cause it is
	47	just something that I got and I got that's that.
	48	**R:** Okay erm, what do you think is causing your urticaria?
	49	**H:** I don't know but I do know that it's made worse by stress, it can be really random. A
	50	few years when I had it badly it was about 3 years ago and I had it every day and I had
	51	to have four months off work because it was every day that it was really bad, the
	52	symptoms yeah it was horrible, erm and I think the more stressed I got about it the
	53	worse it got and that you know I think the stress didn't help I, but anything else I don't
	54	know it just seems to be completely random but that's the only thing I can sort of directly
	55	if stressed gets worse.
Forever	56	**R:** Okay, that's fine, okay erm some patients view their chronic urticaria as short-term,
	57	some believe it's long-term,
	58	**H:**Mmmm
Tine to do battle	59	**R:** ...some people think it will come and go. What's your view on this?
again/ separate	60	**H:** Come and go cause that's what it's done. I think I'll always have it I think. I think its
entity	61	long-term forever unless someone comes up with the cure but I don't know, but mine
	62	comes and goes I got it when I was thirteen and then I didn't have it until I was about 22
	63	so it was a really long gap and then since I was 22 I've had it more regularly but I've just
Appearance	64	had two years without any symptoms erm but it's started to come back again so I'll go
	65	through another round with it I suppose.
Trapped/	66	**R:** Okay. Erm patients often report the consequences of chronic urticaria on their lives.
isolated/mobility/pain	67	In which ways would you say it affected you?
	68	**H:** Well having four months off work didn't help. I had to go and see an occupational
	69	therapist and when I went I had my eyes were swollen and I had well I can't go back to
	70	work, I watch you know erm and its just things like you can't put shoes on. If my feet are
	71	you know swollen I can't get out of the house, I can't get my shoes on, can't walk it's so
	72	painful can't move use my hands cause of my fingers are so swollen and I have to go to

	73	A&E if I get it in my mouth or my tongue swells or something you know that erm spend
	74	the night in A&E as they treat it as an allergic reaction and treat it with steroids but you
	75	have to stay in overnight erm so it can be it, it you know it can be a little pain, a pain
	76	when you got it on your skin or it can be going to hospital for the night, depends on how
Social/appearance/	77	bad it is
solation/ judgement	78	**R:** Yeah, is there any way that it effects you socially?
	79	**H:** Yeah it yeah if I get it on my face, I'm not going to leave the house and you know it's
	80	like I don't want to see anybody because it looks ugly you know big lumps on your skin
	81	you know and your hands are so swollen and you can't put your shoes on and you can't
	82	go out and you don't want to see anybody. I've had it when my lips have really swollen
	83	up you know I don't want to see anybody.Mmmm
	84	**R:** Okay that's fine
oss of control over	85	H:Mmmmm
elf	86	**R:** Okay erm, you've like of answered this question already but do you see urticaria as
	87	something you have control over?
	88	**H:** No, no not at all, no I don't know how to control it, don't know what to do.
	89	**R:** Okay that's fine. Individuals have diverse opinions about on chronic urticaria
	90	medicines to control their symptoms. What are your views on their ability to control your
	91	symptoms?
ertainty/ will come	92	**H:** I don't think they do particularly and I don't know, I mean I've tried various things and
ack	93	at the moment I'm taking fexofenidineItsTelfast and the anti-histamine stuff but I still get
	94	the symptoms I don't think it, I don't know whether it lessons it but I don't think it controls
	95	it, it certainly does not stop it erm and I've never been given anything or any idea that
	96	there might be something that stops it. Steroids I guess but you can't really take them
	97	long-term but they do work really well short-term, yeah, oh [break as dog is involved in a
	98	small incident; both laugh incessantly]
	99	**R:** Do you want me to carry on?
	100	**H:** Can you pause while I just can it up [2 minutes timeout]
	101	**R:** Okay erm you've kind of answered this already, I was going to ask you do you
ture uncertainty	102	believe there will ever be a cure for chronic urticaria?
	103	**H:** I don't know whether that, I suppose it's difficult if you don't know what causes it.If its
	104	stress and a cure for stress well I suppose I don't think so as everybody has different
	105	triggers as to what causes it so I don't think they will be a cure all for it I doubt it.
certainty	106	**R:** Okay that's fine erm. From your own personal experiences erm do you see chronic
	107	urticaria medications as a necessity in managing your symptoms?
	108	**H:** At the moment I do yeah yeah I don't know whether because it just makes me feel
	109	better if I'm taking something to be honest, don't know how effective they are but yeah I
	110	would like not to have anything you know available.
	111	**R:** Okay, erm do you have any concerns about urticaria medications.
	112	**H:** Erm, I don't think there's any long-term effects with the anti-histamines but I would

Long-term effects	113	say with the steroids I suppose causei don't know you know that they can be quite
	114	dodgy to take long-term but they do seem to be the most effective thing to take.Erm but
For all medicines as	115	yeah yes I don't know, I don't, I don't really know about it to be honest. If it's anti-
to case 1 patient	116	histamines then there are probably not side effects but anything else I'm a bit weary of
	117	long-term.
Access/ barriers	118	**R:** Okay erm what are your beliefs about medicines in general?
	119	**H:** Oh I'm all for them. you should I would take whatever is necessary [laughs]
	120	whatever's necessary, yep [laughs]
	121	**R:** Okay, what's led you to believe that steroids might be more dangerous?
	122	**H:** It's just because my GP won't give me, well I've asked him could I have steroids so
	123	that if I do get an attack that I've got them here and he refused this and he won't let me
	124	have them and he's like no you can't you can only take them so long not long-term, so I
	125	have to go over to my GP physically to get steroids after I've had an attack. I'd rather
	126	just have some here to use as and when and I assume there is a reason as to why he
	127	won't give them to me.
Worry/ concerns/	128	**R:** Okay
unceetainty	129	**H:** [laughs]
	130	**R:** Yeah that's fine, people often report that their urticaria can have an emotional impact
	131	on their lives. Would you say it had an emotional impact on your life?
	132	**H:** Yeah definitely got really I was on anti-depressants during the time of work cause it
	133	was, yeah obviously because it was a long time to be off. You worry about your job,
	134	financial situation is effected erm wee don't really know how long it's going to last so you
	135	don't know how long it's gonna be so I would say definitely when its bad it really gets
Uncertainty	136	you down.
	137	**R:** Okay, when you are feeling down can you think of any additional words to describe
Case 1 only	138	your feelings?
husband not children	139	**H:**Mmm, yeah, erm hopelessness I suppose, it just feels that well all a bit hopeless, you
Interference	140	know you think here we go again and you know the and you can't see at as you don't
	141	know when its going to stop you just you know there's no, there's no end in sight to it,
	142	like yes your hopeless.
	143	**R:** Does it have any impact on erm any extended family or significant others?
	144	**H:** No it hasn't so far no erm, it the only time it would have an impact is we had plans to
	145	do something and them I couldn't go I guess or wouldn't go, erm which has happened
	146	but you know that's just, because you can actually see what's wrong they kind of get it.
	147	**R:** Okay and what are their reactions?
	148	**H:** Erm, their really sympathetic and I guess it's and it's a bit like they do ask me what is
	149	it, what's causing it, why can't it be cured but I don't know, I don't know, I don't know.
Justification for other	150	They don't seem to think that you just have it and you have to live with it you know erm
reactions [heebie-	151	but generally they are sympathetic.
jeebies in case 1]	152	**R:** That's good

	153	H:Yeah
	154	R: Yeah
	155	H: Although my brother sometimes laughs at me but you know that's what brothers are
	156	for
	157	R: Yeah
	158	H: I know that [laughs]
	159	R: Okay erm, what strategies do you use in order to cope with your chronic urticaria.
	160	H: I don't think I have any particular strategies to be honest, I think you just deal with it, I
	161	just hope I'm not gonna have an attack. I do worry that if I've got something planned that
	162	it erm its not gonna crop up and I might take a, make sure I'm taking my medications a
imitations in what	163	week in advance, cause sometimes you take it and it's been a while, erm and I haven't
ne can do	164	had the attacks I don't take it erm but I don't think I have any particular coping strategies
	165	at all.
	166	R: Okay, it's just the medication
	167	H: and yes I get on with it and just take the medication.
ame as case 1 end	168	R: Any thinking processes or
thers Identity vs	169	H: Not really, there's not a lot you can do it, it just nothing you can do to to prevent it all
	170	anything you just can't get through it so there's really no point in dwelling about it I
	171	guess.
	172	R: okay erm is there anything else you would like to talk about that might have been
	173	missed?
	174	H: I don't think so erm it kind of, no it is weird I just wish there was a bit more known
	175	about it I suppose you know.It's, it's a funny condition because you try and explain it to
	176	people and then they don't get it until they see it erm and it's not like yourill, it's just erm,
	177	it's a bit like eczema I suppose you know you got a condition it's a skin condition erm I, I
	178	wish I could explain it better I guess but Idon't think there's anything else. No sorry
	179	[laughs]
	180	R: No there's nothing to apologize for. That's great, erm that's your interview
	181	Oh you came all this way, I wish i had more to say [both laugh incessantly]
	182	END

IPA Interview 3

Paula P: Female patient with chronic idiopathic urticaria with delayed pressure urticaria aged 47 years, disease-duration of 47 years

Interview undertaken at St Thomas Hospital during Urticaria clinic (16:36 minutes duration)

R: Okay, first question, I'm interested in what you call your condition? What is your name for it?

P: I docall it urticaria, it feels like it's, at times it's been like a big, it's like I call it when I describe it to people allergies and that I have a rash because obviously, it's so unheard off [laughs]

R: [laughs] That's okay, erm do you consider your urticaria to be an illness?

P: Yeah , it has an effect, when it's at its worst everyday so yeah

R: You would?

P: Yeah,

R: Okay, erm, can you tell me about your chronic urticaria symptoms?

P: Erm, the worst is the pressure urticaria from being at work it absolutely as if I'm using scissors or hand instruments or tools and the pressure of them on my hands and if I walk on my feet all day and then maybe having a parents evening in the night at school erm on the bottom of my feet where the pressure is how, I have to without really realising it wear certain clothes and buy certain clothes so that with belts and buckles even socks, I couldn't wear a pair of socks all day it would be awful, so yeah quite aware of it

R: Okay, any physical feelings or sensations?

P: Erm, the, when it comes up the ordinary urticaria, the tingling and erm at home or when at home again I can feel it be it comes up and makes all of my skin quite sensitive yes.

R: Okay that's good. When did you first become aware of the condition?

P: Erm, through my GP from when I had chronic urticaria, probably had on three separate occasions within maybe a month space the GP printed out some information on it and I kind of read that up and did research on the internet about the condition

R: Okay, if somebody came up to you and saw the condition.....

P: Yeah

R: ...on you and they said to you what is that, erm, how would you define it?

P: Erm , The children often do when it's on me at school and when I'm teaching and it's on my neck and face I just say its allergies, it's like an allergic reaction, it's a rash on me, yeah it's too complicated for them to understand I guess

R: Okay, in your own words and this is a difficult one, what do you think is happening inside your body physically when you are experiencing a bout of CU?

P: I feel kind I may be physically doing too much for myself, feels like I'm fighting myself from the inside out I guess. Does that make sense?

R:That's fine yeah, yeah

P:Yeah from the inside out, like my body is fighting myself when I feel too tired, too tired my body or when I'm exhausted I watch out

R: Erm what do you believe is causing your urticaria?

P: Erm the pressure I guess is obvioustythe pressure of clothes and movement andI don't know why it doesn't make sense to me with the ordinary urticaria of why, I know physically why don't know why me other than anyone else you know

R: Okay have you ever tried to investigate anything potential causes or...

P:yeah, I've followed the food, the food, action sheet with the list of you know cutting out different food groups at different times and I didn't notice an effect and obviously tried different medications didn't notice an effect and just from the pressure urticaria I can avoid it my lifestyle will I quite naturally now because it's been a few years avoid things that cause it but I have researched it but I don't know why me rather than anyone else you know [laughs]

R: Okay, have you ever had any suspicions of what might be causing it?

P: Erm, no its just I haven't ever had it, I had my daughter and then immediately got it, you know before she was almost 6 months old it felt like it was a result of that but just from my head that is you know

R: Okay that's fine. Erm, some people believe their urticaria is short-term, some believe it's long-term, some think it will come and go in cycles. What is your view on this?

P: Erm, I think it feels like it has come to me maybe three years ago and it barely, it feels as if it's burning out now and less frequent and know I maybe have it on and off through my life.

P: Okay what makes you come to that conclusion?

P: because of what doctors here have told me about the burnout cycle and erm because as a baby myself I had what the doctors thought was an allergic reaction, when my feet swelled I couldn't put my shoes on and it did spread and it had the wheals and the classic symptoms of urticaria andso I'm 31 now, I guess that's been a break.

R:Quite a few decades?

P: Yeah I don't know whether it's linked at all but the same symptoms it does sound like so, whether it was that

R: Okay when they were classing it as allergies when you were younger do you know if they related that to just physical urticaria or just unknown?

P: Erm, they, they suggested a lot of things and I had lots of allergy tests but within six months it had gone again completely and so they didn't find any pattern with it.

R: Okay, that's fine erm patients often report the consequences of urticaria on their lives, in what ways would you say it affected you?

P:What I wear and I try and avoid being on my feet too long or in the settee too long yeah I keep moving around so yeah it effects my physical movement and as far as my lifestyles concerned what I wear and the clothes that I can have on my body I guess and shoes and things.

R: Okay, does it affect you socially?
P:If I had a bit more of a life, yeah maybe [laughs] yeah I think it has. I think after, if I go to work for the day I couldn't keep going out in the evenings because physical, the pressure urticaria would make me have wheals and swelling at leaston my feet so it would it does affect my social life I think?
R: Okay, what about significant others like family?
P: Yeah, and when it was at its worse my husband couldn't even come near me physically at all cause everyday I would have either the pressure or ordinary urticaria
R: Okay would you say it's affected you psychologically or emotionally?
P: Erm, I think at first when I was in school and the children would see it on me and go awh what is that on you, it could havebut because it came and went and that I guess with the older children at school it was okay. It could have I think if I was not feeling okay with myself you know.
R: Okay, erm do you think that urticaria is something you personally have control over?
P: No, not on any level, at any time, I don't feel I have control over it
R: Erm, what's drawing you to that conclusion?
P: Because of it being so spontaneous, I still, maybe I do have some degree of control but it's certainly not predictable for me for at least three years.
R: In what ways would you say you have control?
P: I feel like the medication that have worked really immediately the steroid prelisalone medication and when it gets so bad that I've been to the doctor, I I've had to have the prelisalone it's gone within maybe 10 hours I guess, so yeah through the medication only.
R: Okay have you ever tried any other alternative strategies to control it?
P: No not at all, no other than lifestyle and physically, being really aware of it and avoiding triggers for the pressure urticaria you know.
R: Okay erm, what kind of triggers do you try to avoid?
P: Erm like being at work all day and then having to go to something in the evening or I couldn't walk around you know shopping all day. If I wanted to do something else in the evening I ought to try and avoid having the swelling and having the wheals. It's just about I guess prolonging if I feel particularly tired I feel like I can bring it onand obviously in what I wear and the movements side of things again for the pressure urticaria.
R: Okay, erm individuals with urticaria have diverse opinions on the effectiveness of chronic urticaria medications...
P: Yeah
R: What's your view on that?
P:I'm open minded to actual medication but I haven't seen really direct results except for the steroid treatments at all, so sceptical but open minded to it.
R: Okay, erm do you have any opinions on erm any of the side-effects of urticaria medicines?
P: Erm, I was, my husband and I was thinking about having a second child and the methotrexate that was recommended erm after researching and after the opinions from the doctors here, that wasn't suitable but other than that I've taken any medication that has been recommended by the consultants here.
R: Okays, what's your general views on chronic urticaria medications?
P: I'd like to say I've seen some positive effects for my urticaria on them but yeah so at the9:50 XXXXXX for certain moments it feels like the early stages for actual practical fixes I guess to the illness
R: Okay, do you think you will find any medications that will work?
P: I'd like to think so [smiles]
R: Okay, what do you believe the outcomes going to be?
P: I'd like to think that when it does flare up really badly that on a regular basis there's medication that hasn't got the side-effects of the steroid treatments has I guess to just help manage the illness, rather than feeling out of control with it.
R: Okay, that's fine, erm do you believe there will ever be a cure for chronic urticaria?
P: No, I don't believe that because there is just so much trial and error, things with the medications no, maybe there will be i'd like to think that there would be but it just even with the medication it just still feels out of control so I'm struggling to have faith in that
R: Okay, why do you believe urticaria medications are trial and error?
P:I think because research is on a small population of the country I guess suffer from urticaria although the research being done all of the time I think maybe it's there's not enough funding in it I guess because of the small population I'm not sure that's just really my naive opinion, so yeah [laughs]
R:Okay, that's fine. Okay do you believe in the necessity of your urticaria medications?
P: Yeah, I do I think so yeah especially in the future when it's more successful you know, yeah
R: Okay, what do you think you would do if you didn't have any medications, at any particular moment in time?
P: If there was, no steroid treatment, nothing I think it would just get so bad that, because when, if you take the steroid medication it has to be so bad and it continues to get worse and worse. I think my body would be one whole, erm whealit will be awful. I think honestly I wouldn't be able to leave the house, I don't think I'd live, honestly, that is a bit dramatic maybe.
R: No nononot at all, erm I asked you earlier how urticaria might affect you emotionally
P: Yeah,
R: When it does what kind of words come to mind?
P: [five second pause] I think about how it looks on my body or when it's on part of my body show all to my husband when it's on my body just disgusting, it just looks so painful and it is so painful and angry I guess, it's just disgusts me and pain from it.
R: Okay, any other feelings?
P: Erm just quite self-conscious I guess when it's showing and especially when I've slept a

few times and woken up and where it swells on my face and so yeah disgusting, really self-conscious just so self aware of how I'll be physically looking and going to the hospital to get the medications for the swollen face it's just, it's just awful. I think it could makes me, if I was a less confident person it could make me feel really on edge and need to have time of work for emotional stress and physical so yeah

R: Okay, so you think your personality has a lot to do with how you manage?

P: Yeah I kind of believe that in that, yeah, yeah I do.

R: Okay erm apart from medications, what other strategies do you use in order to cope?

P: erm, I guess watching time again with my lifestyle making sure I'm moving, buy big baggy clothes and not wear socks all day, plan my day and time with my kids and things and outside socially so that I'm not on my feet a long time or wearing the same type of clothes all day so it's the physical things that I can do to avoid the pressure urticaria.

R: Okay, you said the pressure urticaria affects you more than the ordinary urticaria

P: Yes I think so and if I can avoid it slightly it's easier as well

R: Okay, erm have you tried any other kind of strategies that are non-medical?

P: No I've not.

R: Okay

P: I've not felt the need to

R: Okay, that's fine erm is there anything else you would like to talk about, absolutely anything?

P: No it's fine, if it was to continue to be a bad as it was at its worse point I'd genuinely think my job would be effected I think emotionally I could be really affected and self-conscious and really aware of the physical side of it and how much that effects my life and I have no idea until I suffer with this how people how physically you feel and how you look matter I guess to me and other people, to children particularly in school yeah so that's it thank you

R: Okay, one more question that I should have asked you earlier

P: Yeah

R: How have you gained most of you knowledge of urticaria?

P: erm, after I was diagnosed at my GP and then referred to a couple of places before I was referred here [St Thomas'] I was researching around it and my mum's a doctor as well so researching with her and the internet research and library researching you know the causes and the treatments, there's quite a bit of information on it but none of it seems really different from the next you know.

R: yeah okay, but you found it useful?

P: Yeah, just to confirm and understand a little more when the consultants say, certain strategies or certain ideas or certain medications, particularly with the medications, researching those yeah

R: Yeah okay, right that's your interview

R: Perfect

END

IPA Interview 4

Mary M: Female patient with chronic idiopathic urticaria aged 52 years, disease-duration of 48 years

Interview undertaken at St Thomas Hospital in urticaria clinic (25:47 minutes duration)

R:Okay, erm the first question I am going to ask you is I'm interested in what you call your condition, what is your own name for it?

M:It [laughs]

R:It?

M &R: It [both laugh]

M:It's bad today, it was bad last week, it's never I don't call it, it's not mine it's definitely IT, it's not me, that's how I deal with it

R:Okay, that's fine, erm do you consider IT to be an illness?

M:Yes, I do

R: You do

M: Yeah

R:What has made you come to that decision?

M:Erm well I've had it forty-eight years so I've had a long time to get used to it. I've been pushed, prodded, poked, stuck with needles you know so it's erh, it's been called different things throughout my lifetime, at times it was idiopathic, sometimes it was autoimmune, erm and I think it was just I got the impression it was much a learning process for the person who was doing the test as it was me trying to find out so

R:So you've had it since you were quite young?

M:Yeah, my earliest was four I erm remember being told that I can't eat grapefruit, they probably didn't know what it was and just like an allergic rash so just picked something and said you can't eat that so erm I just avoided grapefruit for erm for a lot of years until I realised that there were, it was much easier to say what I can eat rather than what I can't

R:Okay that's fine, erm can you tell me a bit more about the symptoms of IT?

M:Symptoms of IT?

R:Yes

M:Erm I eat I come out in a rash. Don't seem to matter very much what I eat or drink or what I put on my skin or wash my clothes in or anything, whether it's hot or cold or in the water or anything I just react spectacularly. Erm and the when was a child it was a rash erm and it would start either on my arms, knees or basically anywhere I had pressure points, erm or where I'd been in cold water my skin would just go blotchy then it would itch for days. Erm and then it progressed as I got older, and once I got the kind of erm menopausal sort of age all hell broke loose and then it was internal as well and angioedema and anaphylactic shock and urticaria vasculitis you name it really

R:So you say it's got worse as you've got older?

M: yeah a lot, lot worse, yeah a lot, lot worse and also the duration of the flare-ups as well. used to be 6 months to a year then it went to 4 years, 5 years, 6 years so yeah a bit of a rollercoaster

R:Yeah it sounds like it, okay can you describe any physical feelings or sensations when you're experiencing symptoms?

M: If I take a lid of a jar and it won't come if it's got resistance cause it's too tight if I know that my hands going to swell up latter and erm it tingles and I know it's going to erm I get a tingle in my lip so I know my lips gonna swell up and when my eyes are gonna to swell up. I get I just, it's just a feeling that I recognise that a few hours before it actually does I know it's going to, ankles and feet and everything andit doesn't just miraculously appears it builds up and then er stays there [laughs a lot]

R:Okay, do you find it flares up like during the day do you find it flares up at more times than not?

M:Night-times, it's always worst at night

R:Night-times

M: Always worse at night. I wake up with it and in the morningit goes down during the day and then flares up at night.

R: Okay, erm when did you first become aware of the condition?

M:Well, I can't say I've gotvery great memories of being four my earliest memory of actually knowing some kind of what was wrong was at eleven and I'd gone done to the swimming pool in the summer holidays with my friends and then the following morning I went into my parents because my back was itching and I showed my mum my back and I honestly couldn't see my back but apparently I had wheals all over my back and then I was taken off to the doctors and erm that was the point at which they decided it was timothy grass. I've got no idea why they choose these particular things to tell me I was allergic tobut erm that was, on that occasion it was the seeds in the grassthat you know like a histamine thing but erm, and I got sent off for the patch tests and all these kind of things but my problem always was the flare ups didn't last as long it took for the hospital appointments to come through so by the time the dermatology appointments came through I'd get well so nothing actually showed up and I always got a standing joke that the only thing I ever got tested positively for anyway was pregnancy because [laughs]I've never,ever reacted positively to anything they test me on, it's not a real, real allergy. It's a pseudo-allergy but it's real enough to me.

R: Okay, erm if someone came up to you and you were presenting with symptoms and they asked you 'what's that' how would you define it in your own words?

M:Usually in laymen's terms I say to them erm if you can't eat strawberries it that kind of thing or if you've had an anti-biotic that's disagreed with you that's the kind of thing it is on steroids [laughs] usually that's what I do I'm very open I will talk about it with people who ask me about it. I tell them what it is, I'm not ashamed of it, not proud of it either but [laughs] I live with it so I'm happy to explain.

R:That's good, erm in your own words would do you believe is actually happening to you

physically when its actually happening to you? What's actually happening inside?
M:I've been told that my understanding is that my immune system is attacking itself and when it attacks itself it crashes a bit like a computer does and you like the blue screens of death and then all hell breaks loose until it kicks up symptoms of diseases and there are alot of autoimmune diseases so that's my own understanding of it, it's my immune system that's attacking itself and when that happens it kicks up symptoms of being allergic to things and then when it comes down again I'm absolutely fine as I am now, haraah [laughs]
R:Erm where did you acquire that understanding from?
M:I can't remember it was too long ago that was erm probably my erm Churchill hospital Oxford I was being referred there I think that was the explanation that was given to me there I think which is there erm there sort of dermatologist there, his name I can't remember, I've seen so many I can't remember but I think it was the, which is a teaching hospital again so, id arrive and feel awful erm walk into a room expecting to see a doctor and get six [laughs]
R:Okay, what do you believe is causing your condition? You've mentioned pregnancy already and you've mentioned.....
M: ...The only thing I have tested positive to...I don't think that has anything to do with it. I was well all the way through my pregnancy so erm I've never believed that it is caused by anything other than something that happened when I was born. I think I was just born with slightly weird immune system that's what I prefer to think about. I don't think I contracted it I think it goes back too far. I think it's just part of me, it's something my body decides to do to me every now and again so
R:Is there a family history?
M: Not particularly although there are wheezes and sneezes and things within you now sort of asthmas and things erm my sister has an autoimmune disease she's got rheumatoid arthritis and that does a lot to actually keep mine in perspective because she's very disabled with it and I'm not so that's very good at keeping my thoughts in check when it all gets too much, yeah
R:Okay, erm some patients believe their chronic urticaria is short-term, some believe it's long-term, some believe it with come and go in cycles. What's your view on this?
M:Mine comes and go in cycles. The way I actually psychologically deal with it is to never think it's gone, never think it's gone that's how I deal with it. It's kind of better the devil you know theory. I can't cope, it breaks my heart every time it comes back, the blessing is that since I've been coming here and I was trialled on the immune-suppressants erm from the very first tablet the whole thing cleared up. I will never be as afraid of what's it going to do to me this time because it's utterly, utterly miserable and erm hard and it affects your whole life and just as I say I say what I can eat rather than what I can't cause it's just ridiculously long, erm and I can eat roast meat and I can eat vegetables, I can't put gravy on anything but I can eat vegetables and I can eat roast meat and that's it [laughs]. Everything EVERYTHING that goes in me or on me willreact so I prefer to just think that it will come back. I find it psychologically easier to deal with it will come back
R:Okay do you usually know when it's going to come back.
M:Yeah I get, it gets tingly. It doesn't kick of spectacularly it I, I do this kind of spot check thing every morning I check my knees and my elbows because that's where it will I get one spot and then the next day I'll be and I'll keep checking it all day and then there will be another one and then another one and another one and progressively worse and worse and worse until theirs is no denying how bad it is anymore and it always starts out very very low and that's why psychologically it's hard because I know what's coming and the frightening thing as I get older every flare up hits me with something slightly worse than it did last time at the starts it's a rash then it was rash and anaphylactic shock, then it was rash, anaphylactic shock and urticaria vasulitis and I've researched I've looked on the internet I just know what all the possibilities are and I find it easier to deal with it as if I half expect it and pre-empt it and can get to the doctor and get medication, get referred and to be honest It wasn't for most of my lifetime it wasn't taken seriously, it was just erm take these, I was always taking enough anti-histamines to fill an elephant couldn't stay awake I was taking massive doses I was taking H1 blockers, H2 blockers, erm to the point I never got indigestion but I [laugh] cause I the H2 was an indigestion remedy but I am couldn't stay awake I was sleeping for hours every afternoon and all night long erm and then a doctor said to me you have a histamine problem . I've had different doctors say different things over the years and it's just easier to say my computers crashed [both laugh a lot].
R:That's fair enough. When you go into a state of remission for a long time erm do you find, you know when the actual urticaria is going to come back or just finally arrives?
M:Erm I get between 3 and 5 years remission normally erm but once I only got a year.
R:Okay,
M:Erm, I've been clutching at straws trying to relate it to you know when it flared up was I stressed was I when it came back? The stress thing I always erm I absolutely understood if I'm stressed it doesn't help. I absolutely do not believe that stress caused it erm chiefly because I lost both parents to cancer and was fine [laughs]
R:Wow
M:If that's not stressful erm I reckon if I can do that and be fine then thats not stress.
R:Mmmm, interesting. Okay erm do you think the condition has any kind of social consequences on your life?
M:Erm, what do you mean if I'm afraid to go out if it's a mess?
R:Yeah
M:I used to be I'm not anymore. I think as you get older you, you care less really, I prefer now to actually explain what's wrong and people want to know. If I see someone, children particularly full of questions but again you know taking the ermcyclosporine there isn't anything to see, erm I was pumped up on steroids at one point erm which psychologically very upsetting because I've always had a weight problem, I'm always fighting to stay slim and you put me on steroids and [laughs] five stone before you can blink and an awful lot ofcomfort eating as well as taking steroids it means I could eat so I did [laughs] anything

dipped in chocolate, my best friend, [laughs]
R:It sounds good [both laugh].Erm, has it affected you physically?
M:Erm I don't like looking at myself when it's bad but again that's something that erm has got easier as I've got older. I think once I got into my forties and I allowed my husband to take photographs of me when I'm bad I was able to take to the hospital I could absolutely understand how hard it is for a doctor when they come in and you say your fine but it was awful last week. You have no idea what I mean whereas I can say this is me last Thursday and hand a photograph over and it's very obvious that since I did that the first time that's when all the other appointments started cropping up. It's like now we can actually see what you mean so that's erm, you know lots less bashful as I've got older
R:Okay would you say urticaria has an effect on you husband or significant others, friends, family?
M: We had a conversation not very long ago about erm I am not my illness I have to remind them of that on occasionally that I'm a can do person not a can't do person, that's something that we do have to deal with on occasion because he's [husband] a very caring man but that can go to the other extreme and erm that can be are you sure you'realright every 30 seconds which can get too much because I have to live with this every day and as I said it is, IT's is not me, I've got IT, IT has not got me and I can find that actually very frustrating to be a victim, to be treated like a victim and I'm not and he's wanted to help and he does help me, cuddles me when I'm having a bad day cause I have been, he's wonderful at that and he's been my absolute rock right the way through and we've been married thirty years, known each other for longer and so he's known me for through thick and thin, fat and thin, everything erm and I say that every now and again there's a little conversation about you know I can do this, he'll never let me come here on my own and that kind of thing so yes [laughs]
R:That's great
M: Yeah conversations here and there
R:Erm, do you consider the condition as something you personally have control over when it's actually active?
M:None, no control over it whatsoever, absolutely no control. No it can be very, very overwhelming and erm my faith really helps me with that. Erm, that's something that over the years particularly erm I was taken to a healing service in 2004 and erm and something happened there that I can't explain and I prayed to be made well and there were people there who were praying with me, I was very, very ill at that time and just about as low as I could get psychologically and er I had a, I had a moment , I had a spiritual moment where I woke up the next morning and everything that could have possibly go bad and erm suddenly I wasn't afraid anymore. I still had all the problems but I wasn't afraid anymore and I don't have any fear, I don't have any fear it's gone but er it was just a way of say my faith is very important to me and erm I know whatever I have to deal with, I'm not on my own
R:That's good, what is your religious faith?
M: Church, I'm Anglican
R:Okay, erm what are your views about chronic urticaria medications? Do you believe they are necessary?
M: Hell yeah [both laugh] yes I'd like to thank the person who invented cyclosporine from the bottom of my heart. I tried to get on it for years and every time I suggested it to the doctor cause I said I looked on the internet and I knew that there had been success with it and I wanted to try it and everyone kept saying no. and it wasn't necessary then I started coming up with these photographs and taking them and erm and suddenly I was here and on it before I could blink and I say first tablet everything was fine I was a very good candidate for cyclosporine and that I am entirely grateful so yes I do to think its imperative because I don't know what would happen without. I probably do know what would happen.
R:Do you have any concerns about any of the medications?
M:I was concerned when I saw that the side effects came in a book rather than a sheet of paper erm but compared to what was happening to me erm I was willing to put up with just about anything and something suddenly erm growing an admirable moustache was a small price to pay compared to what I was going through.
R:Okay, do you ever think there will ever be a cure?
M:Erm, interesting question, erm probably no, no, I don't think so. I'd like to think so but erm I think that's part and parcel with me the better the devil you know thing. I know cyclosporine doesn't erm cure it, it just calms things down but as calms things down that's what I needed doing then that's fine, erm reboot my immune system to behave itself, that's', that's fine
R:What's led you to believe that there will never be a cure?
M:Probably because I've had it for such a long time
R:Okay that's fine. Do you think the condition affects you emotionally? You have kind of answered this already throughout
M:Yeah it has, I deal with it a lot better now, erm my major problem with it was fear and I don't have that anymore erm thanks to my faith but erm they, but yes I've erm oh hell yeah emotional roller-coaster and it's all encompassing if you let it get a grip on you which is why I call it ITand which is way I say I got IT, IT hasn't got me I deal with it better that way because if, if I let IT get control of me, my god it's a horrible place to be
R:If you could describe the emotions in actual words, what words would you use?
M:Powerless, erm I would say victimised, I would say erm distraught, I would say deepest, darkest, purest depths of depression, erm your worst nightmare.
R:Okay, you've mentioned your faith to help you cope, have you ever tried any other coping strategies in addition to your faith and medications?
M:Erm, I would have laid in the middle of the M4 if I thought somebody said it would help, at one point I was absolutely desperate for help erm I went to a spiritual healer once was weird and I rather wish I hadn't but that was erm yeah I did, I would have done anything if hanyone would have said it would help I'd have done it [laughs]
R:Mmm

M:You just want answers, you know just being told different things by different doctors over a lot of years erm and I've been told this nothing wrong with me, being told there's lots wrong with me, being told erm it's idiopathic which just means we don't know erm that to being told its autoimmune, there all just titles as far as I'm concerned I just do what I do and I trot along, take my pills and deal with it when it does

R:Okay that's fine. Is there anything else you'd like to talk about that hasn't come up in the interview so far?

M:Erm, I don't think so, there has been a lot of interesting questions there that I've not thought about in a long time

R:Good, okay erm that's your interview

M: Thank you

END

Appendix 5

NHS Research Ethics Committee Documents (Studies 5 and 6)

Welcome to the Integrated Research Application System

IRAS Project Filter

The integrated dataset required for your project will be created from the answers you give to the following questions. The system will generate only those questions and sections which (a) apply to your study type and (b) are required by the bodies reviewing your study. Please ensure you answer all the questions before proceeding with your applications.

Please enter a short title for this project (maximum 70 characters)
Changing Illness Perceptions in Chronic Urticaria: Pilot Study and RCT

1. Is your project research?

(•) Yes ( ) No

2. Select one category from the list below:

( ) Clinical trial of an investigational medicinal product
( ) Clinical investigation or other study of a medical device
( ) Combined trial of an investigational medicinal product and an investigational medical device
(•) Other clinical trial or clinical investigation
( ) Study administering questionnaires/interviews for quantitative analysis, or using mixed quantitative/qualitative methodology
( ) Study involving qualitative methods only
( ) Study limited to working with human tissue samples, other human biological samples and/or data *(specific project only)*
( ) Research tissue bank
( ) Research database

If your work does not fit any of these categories, select the option below:

( ) Other study

2a. Please answer the following question(s):

a) Does the study involve the use of any ionising radiation? ( ) Yes (•) No
b) Will you be taking new human tissue samples (or other human biological samples)? ( ) Yes (•) No
c) Will you be using existing human tissue samples (or other human biological samples)? ( ) Yes (•) No

3. In which countries of the UK will the research sites be located? *(Tick all that apply)*

[x] England
[ ] Scotland
[ ] Wales
[ ] Northern Ireland

3a. In which country of the UK will the lead NHS R&D office be located:

(•) England
( ) Scotland

( ) Wales
( ) Northern Ireland
( ) This study does not involve the NHS

4. Which review bodies are you applying to?

[x] NHS/HSC Research and Development offices
[ ] Social Care Research Ethics Committee
[x] Research Ethics Committee
[ ] National Information Governance Board for Health and Social Care (NIGB)
[ ] Ministry of Justice (MoJ)
[ ] National Offender Management Service (NOMS) (Prisons & Probation)

5. Will any research sites in this study be NHS organisations?

(•) Yes ( ) No

5a. Do you want your application to be processed through the NIHR Coordinated System for gaining NHS Permission?

(•) Yes ( ) No

If yes, you must complete and submit the NIHR CSP Application Form immediately after completing this project filter, before proceeding with completing and submitting other applications.

6. Do you plan to include any participants who are children?

( ) Yes (•) No

7. Do you plan at any stage of the project to undertake intrusive research involving adults lacking capacity to consent for themselves?

( ) Yes (•) No

Answer Yes if you plan to recruit participants aged 16 or over who lack capacity, or to retain them in the study following loss of capacity. Intrusive research means any research requiring consent in law. This includes use of identifiable tissue samples or personal information, except where application is being made to the NIGB Ethics and Confidentiality Committee to set aside the common law duty of confidentiality in England and Wales. Please consult the guidance notes for further information on the legal frameworks for research involving adults lacking capacity in the UK.

8. Do you plan to include any participants who are prisoners or young offenders in the custody of HM Prison Service or who are offenders supervised by the probation service in England or Wales?

( ) Yes (•) No

9. Is the study, or any part of the study, being undertaken as an educational project?

(•) Yes ( ) No

9a. Is the project being undertaken in part fulfilment of a PhD or other doctorate?

(•) Yes ( ) No

10. Will this research be financially supported by the United States Department of Health and Human Services or any of its divisions, agencies or programs?

( ) Yes (•) No

11. Will identifiable patient data be accessed outside the clinical care team without prior consent at any stage of the project (including identification of potential participants)?

( ) Yes (•) No

Integrated Research Application System
Application Form for Other clinical trial or investigation

NHS
National Patient Safety Agency
National Research Ethics Service

Application to NHS/HSC Research Ethics Committee

The Chief Investigator should complete this form. Guidance on the questions is available wherever you see this symbol displayed. We recommend reading the guidance first. The complete guidance and a glossary are available by selecting Help

Please define any terms or acronyms that might not be familar to lay reviewers of the application.

Short title and version number: (maximum 70 characters - this will be inserted as header on all forms)
Changing Illness Perceptions in Chronic Urticaria: Pilot Study and RCT

Please complete these details after you have booked the REC application for review

REC Name:
London - Hampstead

REC Reference Number:
11/LO/0901

Submission date:
01/06/2011

PART A: Core study information

1. ADMINISTRATIVE DETAILS

A1. Full title of the research:

Changing Illness Perceptions in Chronic Spontaneous Urticaria to Improve Quality of Life Outcomes: A Pilot Study and Randomised Controlled Trial Intervention

A2-1. Educational projects

Name and contact details of student(s):

Student 1

	Title	Forename/Initials	Surname
	Ms	Delaney A	Bucknor
Address	School of Psychology		
	London Metropolitan University		
	London		
Post Code	E1 7NT		
E-mail	d.bucknor@londonmet.ac.uk		

Fax	02073201236

Give details of the educational course or degree for which this research is being undertaken:
Name and level of course/ degree:
PhD Psychology

Name of educational establishment:
London Metropolitan University

Name and contact details of academic supervisor(s):

Academic supervisor 1

	Title Forename/Initials Surname
	Dr Anna Baker
Address	School of Psychology
	London Metropolitan University
	London
Post Code	E1 7NT
E-mail	a.baker@londonmet.ac.uk
Telephone	02073202397
Fax	02073201236

Please state which academic supervisor(s) has responsibility for which student(s):
Please click "Save now" before completing this table. This will ensure that all of the student and academic supervisor details are shown correctly.

Student(s)	Academic supervisor(s)
Student 1 Ms Delaney A Bucknor	☐ Dr Anna Baker

A copy of a current CV for the student and the academic supervisor (maximum 2 pages of A4) must be submitted with the application.

A2-2. Who will act as Chief Investigator for this study?

- (•) Student
- ( ) Academic supervisor
- ( ) Other

A3-1. Chief Investigator:

	Title Forename/Initials Surname
	Ms Delaney A Bucknor
Post	PhD Researcher/ Trainee Health Psychologist
Qualifications	BSc (Hons) Psychology, MSc Health Psychology
Employer	School of Psychology, Life Sciences, London Metropolitan University
Work Address	London Metropolitan University
	City Campus, Culcutta House
	Old Castle Street, London
Post Code	E1 7NT

Work E-mail	d.bucknor@londonmet.ac.uk
* Personal E-mail	dbucknor@aol.com
Work Telephone	02074231204
* Personal Telephone/Mobile	07976788998
Fax	02073201236

** This information is optional. It will not be placed in the public domain or disclosed to any other third party without prior consent.*
A copy of a current CV (maximum 2 pages of A4) for the Chief Investigator must be submitted with the application.

A4. Who is the contact on behalf of the sponsor for all correspondence relating to applications for this project?
This contact will receive copies of all correspondence from REC and R&D reviewers that is sent to the CI.

	Title Forename/Initials Surname
	Ms Delaney A Bucknor
Address	School of Psychology
	London Metropolitan University
	Culcutta House, Old Castle Street, London
Post Code	E1 7NT
E-mail	dbucknor@londonmet.ac.uk
Telephone	02074230000
Fax	02073201236

A5-1. Research reference numbers. *Please give any relevant references for your study:*

Applicant's/organisation's own reference number, e.g. R & D (if available):	
Sponsor's/protocol number:	N/A
Protocol Version:	N/A
Protocol Date:	
Funder's reference number:	
International Standard Randomised Controlled Trial Number (ISRCTN):	
ClinicalTrials.gov Identifier (NCT number):	
European Clinical Trials Database (EudraCT) number:	
Project website: N/A	

Ref Number Description	Reference Number
N/A	N/A

A5-2. Is this application linked to a previous study or another current application?

- (•) Yes ( ) No

Please give brief details and reference numbers.
This application proceeds the following previous study successfully approved by Guy's Research Ethics Committee:

Project Ref: 08/H0804/81

Submission date: 14/05/2008

Title: A Study to Investigate how Beliefs about Illness, Beliefs about Treatment and Coping with Chronic Urticaria Impacts on Well-being and Quality of Life

Key words: Illness perceptions, Treatment beliefs, Coping, Anxiety, Depression, Quality of life

This questionnaire based cross-section study tested Leventhal's self-regulatory model of illness perceptions in chronic urticaria patients. The model proposes that individuals have to in parallel simultaneously deal with not only the threat of the illness but the emotional responses to that threat. These processes are said to influence the types of coping behaviours individuals adopt to manage their condition which then influences illness outcomes. The model is 'self-regulatory' as one goes through a problem solving feedback loop of interpreting illness, adopting coping procedures and then appraising the outcome until a satisfactory level of normality is reached (see protocol). The model is 30 years old and has been substantiated in over 45 studies including research samples with dermatological disorders such as psoriasis, vitiligo, atopic dermatitis and alopecia (see protocol). Descriptive statistics, correlation, multiple regression and structural equation analyses provided evidence to suggest that CU patients do cognitively represent their condition in terms of illness and treatment perceptions and that these are strongly and significantly related to the CU outcomes of psychological distress and quality of life. The findings of this study are detailed in the study protocol and were used in order to design the intervention in the current application.

The study was accepted and presented at the British Psychological Societies Division of Health Psychology Annual Conference in Belfast, Northern Ireland (15th-17th September 2010). It is also about to be submitted to the British Journal of Health Psychology.

2. OVERVIEW OF THE RESEARCH

To provide all the information required by review bodies and research information systems, we ask a number of specific questions. This section invites you to give an overview using language comprehensible to lay reviewers and members of the public. Please read the guidance notes for advice on this section.

A6-1. Summary of the study. *Please provide a brief summary of the research (maximum 300 words) using language easily understood by lay reviewers and members of the public. This summary will be published on the website of the National Research Ethics Service following the ethical review.*

Chronic spontaneous urticaria (CU) is a distressing skin disorder characterised by 6 weeks to years of intensively itchy wheals across the body and is often accompanied by swelling. The condition has a significant impact on healthcare costs, is significantly linked psychological distress and is known to have a significant impact on quality of life (QoL) to the point were measuring this latter outcome is now considered compulsory under current European expert guidelines.

Despite much beneficial patho-physiological research to understand its aetiology, inform treatment and improve QoL outcomes, there is currently no cure and disease management relies on prescribed 2nd generation anti-histamine medicines to control symptoms. Even though CU medicines do not always relieve symptoms in many patients evidence suggests that a substantial proportion engage in health behaviours (e.g. ignoring triggers, taking medications reactively, and medication non-adherence) that result in sub-optimal outcomes.

To gain a further insight to CU aetiology research in recent years has linked CU to numerous psychological determinants but this research has had limitations and lack well established and tested psychological models to inform them. In order to understand CU better and to inform the development of alternative but complimentary theoretically derived and evidence based interventions for CU our previous research used Leventhal's self-regulatory model and found strong and significant evidence to suggest that CU patients misperceptions of their illness in terms of understanding it, its symptoms, causes, timeline, consequences and controllability significantly predicted psychological distress and poorer QoL.

The aim of the current trial is to determine if a brief psychological intervention can (i) change misconceived illness perceptions in CU patients and therefore inform changes in self-management behaviours that (ii) result in significant improvements in psychological well-being and QoL via psycho-education and behaviour goals that are not generic but tailored specifically to CU patients own implicit model.

A6-2. Summary of main issues. *Please summarise the main ethical and design issues arising from the study and say how you have addressed them.*

It is anticipated that the main ethical issues from the research participant's point of view are those of:

1) Consent, participation and withdrawal

Participants may become concerned that once they have signed a written consent to participate in the study, that they have signed a contract that cannot be terminated. As a consequence those who may have second thoughts about participating may feel obligated to continue.

It will be made explicit on the consent form, in the patient information sheet and verbally by the chief investigator (CI) what the participant is consenting to. It will be made clear verbally that the consent form is not a contract but for the participants own safety and the liability status of the researcher. Upon signing the participant will be reminded that s/he can still withdraw from the study at any time without this affecting their existing treatment and services.

2) Anonymity and confidentiality of research data and personal information

Participants may become worried that the information they provide during recruitment, assessment and intervention may become known to their care team and effect their existing and future treatment and services (this maybe especially true as the clinics administration team has provided their personal contact details to the CI.

If participants express this concern they will be informed that the study is being undertaken as part of a doctoral research project and is independent of their current treatment and services. They will then be reminded that they were identified by their Consultant Dermatologist/ clinics administration team as potential participants because they met the inclusion criteria for the study (i.e. a primary diagnosis of chronic spontaneous urticaria). Participants will also be notified that the CI will anonymise participant names and data via an allocated code number immediately after completing the consent form. They will thereafter be referred to by this code number for data analysis purposes only. Participants will be informed before consent that their questionnaire data will be entered numerically onto statistical datasets with their anonymity code (e.g.ST56) which will only be identifiable by the CI. Potential participants will also be informed at the consent stage that interviews may be digitally voice recorded for quality purposes and for data analyse as part of the research but once transcribed will be destroyed. Finally potential participants will have the right to refuse being recorded without jeopardising their wanting to participate. This information will be made explicit in the research participant information sheet.

3) The intervention will be undertaken in the participant's home environment by the researcher

Undertaking the intervention in the participant's home poses ethical issues for the researcher, the participant and the participant's residing family.

For the researcher this involves.
-Risk of injury due to violence or physical assault from the patient or relative
-Assault whilst travelling within the community itself (especially with the CI being female)

These are more likely to depend upon/ more likely to occur.
a) In homes or areas that experience deprivation
b) The nature of the accommodation being visited (e.g. tower block)
c) The location
d) Time of day (especially at night or when it is dark)
e) The patient having a previous history of attacking NHS staff or other community workers
f) The patient having a criminal record related to physical violence or abuse
g) The patient having a history of mental health problems (however these patients are excluded under the studies selection criteria).
h) The patient has a history of alcohol or substance misuse
h) Female working with male patients

The CI will take these factors into consideration by first finding out the nature of the environment that she will be entering and let her supervisor know where she will be visiting, the time of the visit, how long the visit will be and when she is expected to return. The CI will make sure that she is contactable by a fully charged mobile phone as will the supervisor.

The CI will show common courtesy to the participant by waiting to be invited into their home and will remain in an agreed communal area for the intervention. If the participant requests it, they can be accompanied by a family member during the intervention. The participant will be informed that they can refuse entry to the CI at any point in the research process.

These issues will be covered explicitly in the patient information sheet

4) Trial intervention procedures

The intervention procedures of the RCT will not be deceiving participants in any way or exposing them to harmful medical or surgical procedures but is patient-centred and plays more of a psycho-educative and signposting role more than a therapeutic one. Psycho-educative material used in the trial will be examined by two consultant dermatologists who specialise in urticaria for accuracy and the interventions delivery and behavioural procedures (i.e. developing action plans for behaviour change) will be examined and supervised respectively by two registered health psychologists (Dr Anna Baker and Dr Joanne Lusher).

5) Attrition of participants in the control group of RCT

Some skin disorder interventions have found a high attrition rate for patients randomised into the control as to the intervention group. The explanation for this is that skin disorder patients (who are generally active seekers of new disease related techniques) may feel that they are receiving a lesser intervention and being held back from undertaking the new procedure.

As in Ethler et al (1995) patients will be reassured that their existing treatment is not a lesser treatment. This will be done by telling them truthfully that the correct use of second generation H2 anti-histamines is the gold standard recommended and tested treatment for their urticaria. Further they will be informed that the study is a novel intervention that has yet to be shown to have a beneficial effect and that is what the control group will ascertain. Patients will be informed of this after random assignment but this will also be explained in the patient information sheet.

6) The CI is from a psychology background

Evidence in the research literature suggests that potential participant's can be reluctant to participate in studies, trials and interventions of a psychological nature. It is suggested that taking part in such processes may suggest that one is mentally unwell or being labelled as mentally unstable. Participants may feel stigmatised.

As stated in the patient invitation letter, research participant information sheet and verbally before consent, it will be made clear to potential participants that the purpose and nature of the intervention is to change patients negative beliefs and misperceptions of CU and CU medicines and to adopt new behaviours for reducing what are the real symptoms of CU. If patients show further concern they will be informed that the intervention is available to all CU patients of the spontaneous type in the clinic and not because they have been targeted as a special sub-group. Additionally they will be informed that their participation will not have any impact on their legal or medical mental health status as this is not the nature of the study that is independent to their formal medical care.

7) Mistaking the recommendation from the Consultant Dermatologist to become a research participant as a treatment referral. Consequently potential participants decline to participate as they believe that they are being considered for psychological therapy that they feel they do not need.

This issue will be addressed as for point 6 above.

8) The CI is a clinical researcher delivering an intervention and not a therapist.

It will be made explicit that the CI is a clinical researcher and not a therapist in the patient information sheet and participants will also be given a verbal reminder of this before agreeing to participate in the intervention. If the participant requests such an alliance they will be helped with this process by the CI who will take appropriate action (e.g. sign-posting participant to their GP or Consultant Dermatologist) for an appropriate referral. However the CI can be contacted regarding questions concerning the research itself.

9) Participating reveals distressing unforeseen emotional distress

Patients may not know what to do if they discover that their participation has conveyed up unexpected negative emotions or realisations about the impact of CU on their lives. The participant will have the opportunity to withdraw at any time and discuss these feeling with the CI in a non-therapeutic context, to be debriefed, to contact their Consultant Dermatologist to discuss further actions, to contact their GP and to gain advice from the hospitals Patients Advice and Liaison Service (PALS).

10) The perceived dangers of taking part as a research participant in scientific research

Some research participants may make assumptions about participating in scientific or health based research, perceiving it to have harmful side-effects to ones health and well-being.

It will be reiterated to participants that the study will not be exposing them to any harmful chemicals or invasive procedures but to provide new knowledge and information specific to the participants needs and to help in facilitating new health behaviours to improve quality of life and well-being.

A10. What is the principal research question/objective? *Please put this in language comprehensible to a lay person.*

1. To determine whether CU patient's implicit model of CU illness and treatment is amenable to change via a brief psychological based intervention and if these changes occur immediately post-intervention and persist at 3-month follow-up

2. To determine if a brief psychology intervention designed to change chronic urticaria patient's implicit cognitive model of their illness and treatment has an effect on 5 self-reported key indicators of CU-related health outcome (i.e. anxiety, depression, general mental health status, general physical health status and diseases-specific quality of life) and if these changes occur immediately post-intervention and persist at 3-month follow-up

A11. What are the secondary research questions/objectives if applicable? *Please put this in language comprehensible to a lay person.*

1. To qualitatively explore CU patients baseline cognitive representations of their illness and treatment.

2. To evaluate the patient experience over the course of the intervention in terms of its process, content, benefits and shortcomings

A12. What is the scientific justification for the research? *Please put this in language comprehensible to a lay person.*

Background

Chronic spontaneous urticaria (CU) is a distressing skin disorder characterised by 6 weeks to years of intensively itchy wheals and/ or swelling across the body and is estimated to affect 0.5-1.0 of the general population. Other common symptoms include fatigue and tiredness often related to disturbed sleep due to itch. The condition has a significant impact on direct and indirect healthcare costs, is strongly and significantly linked to high levels of psychological distress and is known to have a strong and significant impact on quality of life (QoL) when compared to many other chronic illnesses and healthy adults. Improving QoL in CU is now deemed so important that current guidelines for the management of CU set by EAACI/GA(2)LEN/EDF/WAO (Zuberbier et al, 2009) and the GA(2)LEN taskforce position paper on assessing patient-reported outcomes in urticaria (Baiardini, et al, 2011) recommend that QoL in CU should be measured in clinical trials as a compulsory primary outcome and routinely assessed in clinical practice alongside the gold standard Urticaria Activity Score (Zuberbier et al, 2009a).

The aetiology of CU remains unidentified in up to 70% of patient cases and patho-physiological research linking the condition to allergic, immunological and non-immunological mechanisms are currently either incomplete or better associated as exacerbating factors, however this research has helped to inform pharmaceutical interventions that control symptoms and therefore reduce disease activity and improve QoL outcomes. As a result current guidelines for disease management recommend consistent patient self-regulation and self-management in order to control symptoms (Zuberbier and colleagues, 2009b). This requires patients to avoid triggering or exacerbating factors that are known to worsen CU such as stress, pseudo-allergens and extremes temperatures and adhering to first line anti-histamine medicines, however despite these recommendations it is recognised that the symptom management needs of a substantial proportion of CU patients still remain unmet where up-dosing patients medicines up to 4 times the licensed recommendations still remained ineffective in reducing symptoms (Maurer et al, 2010). In light of this it was recommended that new pharmaceutical treatment modalities need to be researched and implemented to improve outcomes.

Scientific justification

In the context of the current RCT study application for NHS REC approval, it is argued (and has been argued) that continuing to conduct CU research within a single bio-medical framework is hindering the opportunity to establish other determinants and/ or contributors that may explain some of the variance in CU and outcome that remain unexplained or limited by a pure bio-medical model, therefore a more comprehensive bio-psychosocial approach is now warranted (Broom, 2010; Picardi and Pasquini, 2007). Exploring and conducing research into other possible psychosocial mechanisms that adds to (but not opposes) the biomedical model may not only enrich our understanding of CU aetiology and disease-control but help to fill an existing knowledge gap.

Research into a role for psychological and psychosocial mechanisms to date have linked CU to alexithymia (i.e. a personality trait characterised by poor emotional regulation), stressful life events and psycho-neuro-immunological mechanisms (Barbos et al, 2011; Berrino et al 2006, Conrad et al, 2008; Dyke et al, 2008) but research is either still in its infancy or predominantly cross-section and retrospective in design creating difficulties in determining what factors

are determinants, maintaining factors or outcomes of the condition. In order to understand CU better and to inform the development of an alternative but complementary theoretically derived and evidence based CU intervention, the current intervention study is based upon preceding research exploring whether aspects of Leventhal's extended self-regulatory model of illness perceptions played a role in CU, CU-related coping behaviours and CU-related outcomes.

Leventhal's Self-regulatory model of illness perceptions

Over the past 30 years, psychological research has provided strong evidence to suggest that chronically ill individuals construct lay perceptions about their illness in order to make sense of it (Leventhal et al, 1980). These beliefs are said to come from exposures to social messages and personal experiences of illness known as illness perceptions (also known as cognitions or representations). Studies have identified 5 dimensions in which individuals give meaning to their symptoms: 'symptom identity' (i.e. the labels one applies to symptoms: e.g. 'I am itching so I have hives'), 'causal attributions' (e.g. stress), 'timeline (e.g. acute, chronic and cyclical), 'consequences' and 'curability/ controllability' (i.e. beliefs about personal and treatment control). These factors have been found across a diverse range of medical conditions (Hagger and Orbell, 2003) including chronic skin disorders such as psoriasis, (Fortune et al, 2002) atopic dermatitis (Wittkoski et al, 2007), vitiligo (Papadopoulos et al, 2002), and alopecia (Cartwright et al, 2009) and have been operationalised within Leventhal's Self-regulatory (or commonsense or CSM) model of illness perceptions (Leventhal et al, 1980).

The self-regulatory model proposes that individuals have to in parallel simultaneously deal with not only the threat of the illness but the emotional responses to that threat. These processes are said to influence the types of coping behaviours individuals adopt to manage their condition which then influences illness outcomes. The model is self-regulatory as one goes through a problem solving feedback loop of interpreting illness, adopting coping procedures and then appraising the outcome until a satisfactory level of normality is reached. Evidence for the model is well documented in the literature across a range of illnesses predicting diverse outcomes including QoL in chronic fatigue syndrome (Rutter and Rutter, 2002), multiple sclerosis (Spain et al, 2007), cancer (Llewellyn et al, 2003), kidney disease (Fowler and Bass, 2006), dialysis (Timmers et al, 2008), and alopecia (Cartwright et al, 2009) and psychological distress in coronary heart bypass (Hermele et al, 2007), allergy (Knibb and Horton, 2008) and psoriasis (Fortune et al, 2002).

Illness perceptions in chronic spontaneous urticaria

In the current researchers study of 81 CU patients recruited from St. John's Institute of Dermatology at St. Thomas Hospital, London it was found that cognitive representations of illness were generally in line with other medical conditions. Patients associated CU with the symptoms of wheals, pruritus and swelling (> 95% of sample) followed by fatigue and pain (> 50%).

Patients equally attributed both psychological and immunity causal factors to their illness with stress and worry again being the most reported. The former was in line with research implicating emotions, stressful life events and psycho-neuro-immunological mechanisms to stress and itch (Gupta and Gupta, 2004; Richards et al, 2004; Van Laarhoven et al 2010) but for the latter CU patients who illness was linked to immunity made up only 5% of the study sample. For the remaining perceptions patients believed CU to be a chronic and cyclical condition (>90%) that had serious consequences (87.5%) and reported highly charged emotional responses (87.7%). In addition 42% of patients believed that they had no personal power to influence CU with almost equal proportions agreeing (35%), disagreeing (31.3%) and reporting ambivalence (33.8%) about whether what they did would make CU symptoms better or worse. Further beliefs in the necessity of taking CU medicines equalled concerns. The sample was split between those having high or low illness coherence. Most patients reported accepting their CU with active coping and planning being the next most commonly reported coping behaviours.

Relationships between illness perceptions linked those who attributed a high number of symptoms to their CU to perceptions of serious consequences and a greater need to take CU medicines. Patients believing their CU to be long-term also reported a similar pattern and also poorer disease control. Interestingly, a greater understanding of CU was related to lesser emotional responses and lesser concerns about CU medicines. A surprising finding found that both problem-focused and avoidant coping strategies were both related to poorer outcome suggesting that even though CU patients were active in finding solutions to their condition, these strategies may not be the most productive with little returns. Further hierarchical linear regression analyses found that many illness perceptions were significantly related to outcomes but it was attributing a high illness identity and high chronicity beliefs that were the consistently strong and significant determinants of psychological distress and poorer QoL (including worse pruritus). These findings were interesting as many of the symptoms attributed to CU are not usually diagnostically associated with the condition. Other strong predictors in particular outcomes were perceptions of treatment control on depression, serious consequences on general physical health status and disease-specific QoL and concerns about medication on general physical health status. Finally path analyses by structural equation modelling confirmed that perceptions predicted outcomes independent of a mediating effect for coping behaviours (coping itself being a poor and insignificant predictor of outcome).

Implications for changing illness perceptions, coping and outcome in CU

It was recommended that psychological interventions adjunct to medical care should focus on the CU patients own implicit cognitive model of CU by cognitively challenging inaccurate perceptions of illness and treatment and filling in specific gaps in knowledge through psycho-education. Doing so may reduce cognitive representations of illness and emotional threat. Additionally the use of person centred action plans may help and support the CU patient to learn new health behaviours that improve self-efficacy beliefs. The importance of these findings were that unlike fixed personality and socio-demographic factors, it could be hypothesised from Leventhal's model that changing negative and misconceived illness and treatment perceptions of CU may result in the use of more positive health behaviours related to better disease self-regulation and self-management and therefore result in significantly better self-reports of CU-related QoL outcomes. Additionally the use of the model would also allow psychological determinants, contributors and outcomes in CU to be systematically followed and evaluated, a major shortcoming found in previous psychological based skin disorder intervention studies. As the model has been used successfully to change illness perceptions and outcome in other chronic illnesses including myocardial infarction (Petrie et al, 2002), haemodialysis (Karamanidou et al, 2008), diabetes and asthma (McAndrew et al, 2008), cancer pain (Ward et al, 2008) and psoriasis (Fortune et al, 2004) where patients held illness perceptions in a similar schematic way to CU patients, it is proposed that self-regulatory interventions may also be successful in CU.

Mechanisms of self-regulatory interventions based on Leventhal's CSM model

Unlike conventional educational approaches interventions based on the CSM start with the patient's own implicit model of illness as a basis for filling in gaps in knowledge and for challenging misconceptions. The use of individualised patient-centred action plans and linking behaviour to specific outcomes are another common feature.

As described earlier Leventhal's model postulates that in order to create a representation of our illness in the first place we use both concrete and abstract pieces of information in order to guide their development. Representations are developed by lay (or commonsense) information we assimilate within our socio-cultural environment, (e.g. media accounts from TV and the press, others with illness), significant others (e.g. parent, friends, family, doctors) and our own personal experiences of the illness. The representation is formulated as part of a two stage process known as the symmetry rule: When the symptoms or somatic experiences are felt, the individual searches for abstract information and finds a schema (or label) for the experience. The schema itself is based on concrete evidence undertaken by searching for the body sensations being experienced; hence this process involves both top-down (abstract/ cognitive) and bottom-up (concrete/ behavioural) processing. Unfortunately these representations formed in the psyche can be misconceived, erroneous and incomplete in the level of detail required attaining an accurate depiction of the illness that will be used to either direct how we cope or effect how we perceive or experience illness outcomes.

The self-regulatory model is a dynamic model supporting and explaining the implications of information processes to illness cognition and behaviour. Of overarching importance is its self-regulative feedback loop that acts as a mechanism between cognition and behaviour and this allows the model to be used in one of two ways when designing interventions that influence disease management and outcomes (McAndrew et al, 2008). Interventions can begin from the bottom-up (using concrete/ behavioural strategies) or from the top-down (using abstract/ cognitive strategies). The former focuses on behaviour to create an overarching view of the illness as a chronic condition that requires consistent self-regulation and self-management. The latter provides the patient with a conceptual framework for the illness so that they can recognise that the illness is still chronic even when presenting as asymptomatic, hence the new conceptual framework provides the patient with an implicit model to appropriately interpret bottom-up information generated by behaviours. The current author's research on CU patient cognitions presented above suggests the use of a top-down approach (i.e. changing illness perceptions), however as evidence suggests that CU patients do not always partake in health behaviours that are conducive to good self-regulation and self-management (Maurer et al, 2008, 2009) bottom-up processes are also deemed to be important. Maurer and colleagues found that although 78% of CU patients took CU medicines only 33% took them preventatively, waiting until symptoms began before starting treatment. Additionally 50% reactively used anti-itch lotions, a quarter did not avoid possible triggers to outbreaks and a third did not take medicines at all despite their availability. Further only 44% of 83% under a physicians care discussed outbreaks when symptoms did not respond to treatment and 25% believed CU to be a sign of personal weakness further raising questions why many CU patients behave in sub-optimal ways to symptom control despite a risk of experiencing poorer outcomes.

McAndrew et al (2008) also states that self-regulatory interventions need to consider the fidelity of their implementation in terms of being person-centred and evidence based. With these criteria in mind the delivery of the present intervention uses an adaptation of the representational approach to patient education (or RA) by Donovan and colleagues (2001, 2007). The RA is a patient centred approach that is theoretically based within Leventhal's self-regulatory model of illness perceptions. The RA is undertaken in 7 stages:

(1) Representational assessment
(2) Identifying & exploring gaps, errors & confusions

(4) Introducing replacement material
(5) Summary, (6) goal setting & planning
(7) Follow-up contact: goal and strategy review

In order to create conditions for conceptual change the RA is also based upon the model of conceptual change (Posner, Strike, Hewson and Gertzog, 1982). The model of conceptual change explains how individuals go through a process of learning new information, often having to reconfigure or adapt existing cognitive structures in order to accommodate them through assimilation and accommodation.

The model of conceptual change itself complements Leventhal's model as it explains how individuals go through a process of learning new information, often having to reconfigure or adapt existing cognitive structures in order to accommodate them. The model proposes that we all have a network of concepts in our minds known as a conceptual ecology. These concepts are interrelated and the development of this ecology (i.e. learning) happens under the two distinct processes of assimilation and accommodation.

Assimilation: This process occurs when an individual fits new incoming information into an already developed cognitive schema or conceptual. For example a child sees all animals that swim in water as fish. This fits well into the child's fish concept and is easily assimilated with no changes to the conception.

Accommodation: This process occurs when incoming information cannot fit comfortably into an already developed cognitive schema or conceptual understanding. This new information will need the existing conceptual ecology to transform or reorganise itself. When the same child sees a frog swimming and calls it a fish he or she will need to be corrected. This requires not only a reformulation of the fish concept but also the development of a new 'frog' concept. This is the conceptual change.

In the context of cognitive representations of illness, the representational approach postulates that patients already hold knowledge and ideas about their condition and interactions occur between new information being assimilated and the existing cognitive representation. Unfortunately accommodation does not always occur here and instead patients may force incoming information into existing concepts (e.g. 'I have hives and a headache so I have CU' or 'I have developed hives again I was stressed'). The aim of the approach is to facilitate the accommodation process to allow for conceptual change. Posner et al (1982) states that conceptual change occurs when:

(i) the individual becomes dissatisfied with their existing conception
(ii) the new conception presented seems intelligible so it makes better sense
(iii) the new conception seems plausible so it could actually be true and
(IV) the new conception seems that it may lead to a positive change.

Additionally change may happen when the individual has had the chance to comment on their own ideas. Steps 6 and 7 of the RA include the complimentary bottom-up approach of action planning to an initial top-down process. This is important as evidence suggests that when practitioners focus on the patient's model of illness (a top-down process) this elicits more patient questions about the illness but it is the focusing on action plans (a bottom-up approach) that results in more discussion on the psychosocial aspects of treatment and lifestyle factors rather than the illness representation (De Ridder et al, 2007). With the findings of CU patient behaviours reviewed earlier (Maurer et al, 2008) eliciting behavioural plans after a process of conceptual change may prove critical. Additionally the assessment of emotional representations (often absent from CSM interventions; Cameron and Jago, 2008) is included as CU patients often report that the emotional impact of CU is inadequately addressed by clinicians (Maurer et al, 2008)

In order to determine if patient's goals are 'doable' the concept of SMART goals will be used to action planning to determine if patients goals will be Specific, Measureable, Attainable, Realistic and Time-bound (Doran, 1981).

The scientific justification and evidence base for the current RCT study is deemed sufficient to answer the following research questions

1.Determine whether a self-regulatory intervention has an immediate effect on changing illness perceptions in CU patients.
2.Establish if the effect of changing perceptions persists at 3 months post intervention from baseline and post intervention
3.Determine if the self-regulatory intervention has an immediate effect on self-reported CU-related outcomes.
4 Establish if the effect on self-reported CU outcomes persist at 3 month follow-up when compared to baseline reports.
5.Qualitatively explore CU patients baseline commonsense representations of their illness
6.Evaluate the patient study experience over the course of the intervention

A13. Please summarise your design and methodology. *It should be clear exactly what will happen to the research participant, how many times and in what order. Please complete this section in language comprehensible to the lay person. Do not simply reproduce or refer to the protocol. Further guidance is available in the guidance notes.*

Methodology- Main intervention (RCT not Pilot)

Design

The study is a randomised controlled trial (RCT) of a mixed 3 x 2 experiment design. The experimental design is broken down as follows:

Between groups factor: Treatment group (IV1)
Level 1: Self-regulatory intervention group (L1)
Level 2: Usual care control group (L2)

Within groups factor: Assessment timeline (IV2)
Level 1: Baseline (T1)
Level 2: Post-intervention (T2)
Level 3: 3 month post intervention follow-up (T3)

For the first analysis the dependent variables will be changes in aspects of illness perceptions as follows:

(DV1) Illness coherence, (DV2) Identity (DV3) psychological cause (DV4), immunity cause (DV5) timeline (DV6), consequences (DV6), curability/ control (DV7) and emotional representations (DV8).

Research hypotheses

1.There will be no difference in perceptions of (1) illness coherence, (2) symptom identity, (3) psychological cause (4) immunity cause (5) timeline (6) consequences (7) controllability (8) emotional representations between the intervention and the usual care control group at baseline.

2.Patients in the intervention group will report significantly (1) more illness coherence, (2) lower symptom identity (3) less psychological causal attributions (4) lesser immunity causal attributions (5) lesser timeline perceptions (6) lesser serious consequences (7) better control and (8) less emotional representations than the usual care control group at post-intervention.

3.Patients in the intervention group will report significantly (1) more illness coherence, (2) lower symptom identity (3) less psychological causal attributions (4) lesser immunity casual attributions (5) lesser timeline perceptions (6) lesser serious consequences (7) better control and (8) less emotional representations than the usual care control group at 3-month post intervention follow-up.

For the second set of analyses on CU-related outcomes the dependent variables will be as follows:

(DV1) Anxiety), (DV2) depression, (DV3) general physical health status/ QoL, (DV4), general mental health status/ QoL, (DV5) overall disease-specific QoL (DV6) and disease severity/ activity.

Research hypotheses
4. There will be no difference in (a) anxiety, (b) depression (c) general physical health status and QoL (d) general mental health status and QoL (e) disease-specific QoL and (f) disease-activity between the intervention and the usual care control group at baseline.

5. Patients in the intervention group will report be significantly (a) less anxiety, (b) less depression (c) better general physical health status and QoL (d) better general mental health status and QoL (e) better disease-specific QoL (f) less disease-activity than the usual care control group at at post-intervention

6. Patients in the intervention group will report be significantly (a) less anxiety, (b) less depression (c) better general physical health status and QoL (d) better general mental health status and QoL (e) better disease-specific QoL (f) less disease-activity than the usual care control group at 3-month post intervention follow-up

Participants

Participants will be aged 18 years or older and have a medically confirmed primary diagnosis of chronic spontaneous urticaria. They will also have active disease and speak English with a good command of written English. Patients with a primary diagnosis of acute urticaria, chronic physical urticaria; urticarial vasculitis; chronic urticaria as side effect of

another illness (e.g. cancer) or have psychiatric or cognitive impairments affecting the capacity to complete the studies questionnaires will be excluded. The estimated sample size for the main study will be 62 participants plus 10 extra participants will be used for the pilot study (see question on sample size later in this application).

Measures and materials

Patients will complete the following standardised and validated questionnaires at 3 time points. All instruments have been validated in previous CU study samples.

•The Revised Illness Perceptions Questionnaire (IPQ-R): Assesses cognitive representations of illness
•The Beliefs about Medicines Questionnaire (BMQ): Assesses cognitive representations of treatment.
•Hospital Anxiety and Depression Scale (HADS): Assesses out-patient clinical anxiety and depression.
•Short-Form 36 Item Health Survey UK 2 (SF-36v2): Assesses patients' general health status and QoL
•The Chronic Urticaria Quality of Life Questionnaire (CU-Q2oL): Assesses disease-specific QoL.
•You and your urticaria questionnaire:
•Urticaria Activity Score (UAS): Gold standard clinical measure of disease severity and activity in urticaria
•Patient study experience evaluation questionnaire: To evaluate the main intervention (non-validated).

The following study materials will be developed (documents included in NHS application).
•Patient invitation letter
•Consent form: Patient consent form to participate in the trial created and compiled using NHS guidelines.
•Research participant information sheet (PIS; for RCT): Created and complied using NHS guidelines.
•Patient commonsense interview: Assesses knowledge gaps and misperceptions of CU
•Action plan worksheet: Consisting of agreed actions from the intervention.
•Intervention guide: Instruction manual on how to conduct the intervention
•Digital voice recorder: To record the commonsense interview and pilot study focus group evaluation.

Procedure

1. Patients will first be identified and recruited from the urticaria clinic in one of the two ways described below:

Urticaria Clinic:
These patients will be identified and approached by their consultant dermatologist during their clinic appointment. At the end of the patient's appointment the consultant will make the patient aware of the trial and determine their interest in finding out more information. If the patient is interested, they will be introduced to the CI by the consultant. The CI will describe the trial to the patient and what it involves. If the patient decides that they want to participate they will be given the research participant information sheet to read and the consent form to sign. An appointment will be made for the first appointment plus a copy of the questionnaire pack and UAS will instructions of how to complete both.

Patient database:
These patients will be identified through the clinics urticaria database by the clinics administration staff whom will provide the CI with each patient's names, addresses, phone numbers and diagnoses with the patients permission. Database patients will be recruited by phone by the CI, informed about the study and asked if they would be interested in taking part. Interested patients will have the study described to them further including what it will involve. If the patient decides that they want to participate they will be posted the research participant information sheet to read with the consent form to sign, the questionnaire pack to complete and the UAS. The CI will instruct the patient of how to complete the latter two and an appointment will be made for the first appointment.

2. Participants will be informed that they will be randomised to 1 of 2 groups as detailed in the patient information sheet

Group 1: CSM intervention group:
The intervention will take place in the patient's home over 2 sessions of approximately 45 minutes duration each and a follow-up phone-call over 3 consecutive weeks and will include pre and post intervention assessments and follow-up

psychologist) will be undertaking the intervention and will be supervised by her first academic supervisor Dr Anna Baker and second academic supervisor Dr Joanne Lusher (both Registered Health Psychologists)

Session 1: Challenging Illness Perceptions: Part 1 (45 minutes)

Approximately a week after completing the questionnaire pack and the UAS, the patient will be interviewed to gain a full understanding of their current commonsense model of CU along the dimensions of CU illness coherence and perceptions of CU identity, cause, timeline and consequences. The patient is encouraged to ask questions regarding their existing knowledge of the component in question and how they developed. Misconceptions, negative beliefs and gaps in the patient's knowledge about CU are identified and noted by the researcher during the interview process. Information is then provided to patients to in fill gaps in their existing knowledge and misperceptions addressed. All information will be provided in a neutral and person-centred manner by the clinical researcher and the type and detail of the information will depend upon the patients existing commonsense model and the amount of detail necessary. The clinical researcher will take the completed questionnaire pack and UAS for baseline analysis (see question A-12 for a scientific justification and explanation of the mechanisms and processes involved in these procedures under the heading 'mechanisms of self-regulatory interventions based on Leventhal's CSM model)

Session 2: Challenging Illness Perceptions: Part 2 and Developing a Person Centred Action Plan (45 minutes):

• Challenging Illness Perceptions: Part 2
The patient is interviewed as in session 1 to gain a full understanding of their current commonsense model of their perceptions of the curability/ control perceptions of CU. Misconceptions that lead to poor disease management will be challenged as in session 1. Information provided will also include dispelling erroneous beliefs about CU medicines. Patients will have the opportunity to discuss their emotional representations and this will be linked to CU self-regulation and self-management.

• Developing a Person Centred Action Plan

The overall goal of part 1 is to leave the patient with a more complete and accurate conceptual understanding of CU in terms of:

•A concrete and abstract understanding of what CU is (illness coherence)
•An ability to distinguish between symptoms that are related and unrelated to CU (identity)
•Knowing the importance of broadening the causal model of CU beyond stress (cause)
•Gaining a more realistic timeline of CU (timeline)
•Discovering that some misperceptions held of CU impact are unjustifiable (consequences)
•Acknowledging better ways of controlling CU (curability/ control)
•An ability to link emotional responses to misperceptions of CU illness/ treatment.

After a process of conceptual change the patient and clinical researcher together development an action plan of behaviour change (i.e. partake in fruitful self-regulatory and self-management behaviours) based upon the material covered over the two sessions. This is done in four stages:

(1) Setting goals
Firstly a clear goal is defined so that both the clinical researcher and CU patient know where to target. Areas for change should have emerged from the cognitive interview especially from the discrepancies identified in the personal and treatment control discussion aspect of the intervention. Example questions to the patient would be 'what is it that you want to change?' Or 'Lets take one step at a time. What do you think is the first step?' The patient chooses the goal to work on but the clinical researcher can suggest more goals and when goals are multiple and interrelated to others can elicit from the patient which ones can be prioritised. Behavioural goals (e.g. I will use my anti-itch cream as advised by my dermatologist; I will do relaxation exercises when I become stressed to decrease the chances of exacerbating my CU) and outcome goals (e.g. to reduce itch; to get a better night sleep) are differentiated from each other.

(2) Considering change options
Once behavioural and outcome goals are set and distinguished brainstorming and menu option strategies are used to establish how they will be overcome. Brainstorming is encouraged as there is usually more than one way to get to a goal. The focus is to draw on the patients own internal resources and social support networks and this is undertaken without any evaluation of their shortcomings to keep a flow of the patients thoughts while avoiding resistance. Having menu options helps to avoid the ideas of the clinical researcher being refuted one by one (e.g. patient explains what's wrong with them in turn) as the process becomes one of choosing an option as to blocking them (e.g. 'Here are some possibilities that other CU patients have used successfully. Which of these do you prefer? Which do you think might work for you'

(3) Arriving at a plan
After discussing and negotiating the change options the next step is to arrive at the actual plan. The researcher will plan to elicit the CU patient to actually voice this plan as much as possible. In order to determine if patient's goals are 'doable' the patient is elicited to determine if their goals are SMART ones (i.e. Specific, Measureable, Attainable, Realistic and Time bound). For example

GOAL: I want to sleep better (outcome goal)

Specific: I will take my last daily dosage of CU medicines at 8pm in the evening with my evening meal to allow them to continue to work before I go to bed(behavioural goal)

Measureable:I will keep a diary next to my bed and write a short note of my ability to concentrate during the day and wakefulness I feel in the morning

Attainable. Yes I will keep my medicines on the dinner table as a visual reminder

Realistic: Yes I eat my dinner at home most days at this time

Time bound: I will try this for a month to see if this works

In order to complete the written action plan, the action plan worksheet is presented to the CU patient to fill in and the plan will be summarised with the patients own goals and needs.

(4) Eliciting commitment
Ideally the preceding step should lead to eliciting a commitment from the CU patient. This is done by seeking the patient's approval with the action plan. The patient is simply asked if they are happy with the plan (e.g. 'Is this what you want to do')

If the patient does not say yes but 'I guess so' or 'I'll think about it' the reluctance to commit to the action plan should be explored by going back a few steps. This is usually undertaken by exploring further the reluctance to change and/ or amending the action plans.

Session 3:Follow-up telephone call (20 minutes approx):

•The patient will be called by the CI to determine how they are finding the action plan and given the opportunity to ask further questions. The patient is posted another questionnaire pack (minus characteristics instruments) to complete to allow for the examination of the immediate effects of the intervention on changing perceptions from baseline reports. The patient will also be sent another UAS diary to complete. Both are returned to the CI in a business reply envelope.

Three months Follow-up

Three months post intervention patients will be contacted by phone by the clinical researcher and informed that they will be sent a final questionnaire pack plus an intervention evaluation questionnaire and the UAS. The UAS is completed for 7 days before returning the pack in a postage paid envelope. When the final assessments have been received by the clinical researcher, the participant will be contacted by phone, debriefed and given the opportunity to ask further questions.

Group 2: Usual care control

These participants will not go though the 3 trial sessions but will be visited at home on one occasion for a single 30 minute appointment. Their importance to the study will be explained and they will have the opportunity to ask questions. The participants will be sent a second questionnaire pack and UAS diary to complete 3 weeks after the appointment and a third questionnaire pack, UAS diary and evaluation questionnaire 3 months after the second. Both will be preceded by a phone-call from the researcher. Participants will be provided with a business return envelope to return all assessments. When the final assessments are received participants will be contacted by phone and given the opportunity to ask questions.

Pilot study

The purpose of the pilot study is to test the feasibility of the recruitment process, study assessments and intervention procedures prior to the main study. Ten patients with active CU recruited from the clinic database will be non-randomly

allocated to take part in the pilot study. These participants will be recruited in the same manner as for the main study and undertake the same pre-intervention assessments and the 3 intervention sessions over a 3 week period. However they will not partake in the 3 month follow-up assessment and evaluation but their data will be analysed for exploratory purposes only. All pilot study participants will evaluate the intervention with the same questionnaire given to participants in the main RCT study and will contribute to any amendments that need to be made. The CI will also evaluate issues related to costing, timing and management so that these can be amended. Research ethics will be notified of substantial ammendments in accordance to it's guidelines. Additional documents will include:

•Research participant information sheet (PIS, pilot study): created and compiled using NHS guidelines.

RCT Evaluation:

•Patient evaluation

The patient evaluation of the RCT intervention will be undertaken within the patient evaluation questionnaire stated in the procedure section and will include an evaluation of the following components:

(1) The recruitment process (approach, information and consent)
(2) Assessments (use of questionnaire pack, use of UAS)
(3) Experience of commonsense interview (understanding, delivery, relevance, length, content)
(4) Psycho-education (content/ detail, relevance, delivery of information)
(5) Challenging perceptions (respect of researcher, conduct of researcher)
(6) Action plans (role in development, understanding, feasibility)
(7) Sessions (length, format, information)
(8) Overall intervention (usefulness and quality rating, recall, length, format, setting, organisation)

• Process evaluation

The trial will be evaluated in line with the medical research council (MRC) framework for developing and evaluating RCT studies for complex interventions to improve health (MRC, 2002). How the RCT fits into the framework is as follows:

1. Theory:
One literature review on CU and quality of life (QoL) and two systematic reviews on QoL and QoL measurement in CU already undertaken to precisely determine the impact of CU on bio-psychosocial aspects of QoL and which QoL instruments will best assess this in future research. Literature review undertaken to determine benefits and limitations of the medical model in determining CU and CU-related outcomes and the need for applying a more bio-psycho-social approach to the problem.

2. Modelling.
Literature review undertaken of the feasibility of incorporating CU and QoL research into a well-established health psychology based model. Cross-section study already undertaken to determine components of Leventhal's extended self-regulatory model of illness perceptions in a CU sample of 81 formally diagnosed CU patients. Findings concluded that CU sample think about their condition in terms of the models components, that components are strongly and significantly related to QoL outcomes and also predict outcomes. It is hypothesised that negative and misconceived perceptions of CU are amenable to change and that a change in cognitive representations of CU illness will result in self reports of better QoL

3. Exploratory trial:
The current protocol includes a pilot study to determine if the trials recruitment process, delivery procedures, materials, costing and timing are appropriate for the main trial (see pilot study above). Amendments will be made and resubmitted if required.

4. Definitive RCT
The Definitive RCT is the current protocol.

5. Long-term implementation.
The intervention will be assessed post-intervention and at 3-month follow-up but long-term implementation has not been determined as is being undertaken as partial fulfilment of a PhD qualification.

• Cost evaluation

(1) Trial registration
(2) Paper and printing: consent forms, invitation and GP letters, patients assessment/ evaluation questionnaires, intervention guide, action plan worksheet)
(3) Travel/ transport and postage. travelling to and from patients' place of residency, postage stamps,business reply postage)
(4) Stationary and equipment: e.g. pens, notepad, digital voice recorder
(5) Data analysis.

A14-1. In which aspects of the research process have you actively involved, or will you involve, patients, service users, and/or their carers, or members of the public?

- [x] Design of the research
- [ ] Management of the research
- [ ] Undertaking the research
- [ ] Analysis of results
- [ ] Dissemination of findings
- [ ] None of the above

Give details of involvement, or if none please justify the absence of involvement.
Ten participants will be involved in the pilot study of the intervention to test the feasibility of the recruitment process, study assessments and intervention procedures prior to the main study. Ten patients with active CU will be recruited from the clinic database to take part in the pilot study. These participants will undertake the same pre-intervention assessments, intervention sessions and the post-intervention assessments as described in the attached protocol over a 4 week period however they will not partake in the 3 month follow-up assessment and evaluation of their data will be analysed for exploratory purposes only.

4. RISKS AND ETHICAL ISSUES

RESEARCH PARTICIPANTS

A17-1. Please list the principal inclusion criteria (list the most important, max 5000 characters).

- Primary medically confirmed diagnosis of Chronic Spontaneous Urticaria of the idiopathic or autoimmune type
- Experiencing active disease (i e pruritus with or without angioedema)
- Speak English as a first or fluent Language with a good command of written English

A17-2. Please list the principal exclusion criteria (list the most important, max 5000 characters).

- Primary diagnosis of acute urticaria (< 6 weeks duration)
- Primary diagnosis of physical urticaria
- Disease related to but not spontaneous CU (e.g. urticarial vasculitis)
- Developed spontaneous CU as a side effect of another major illness
- A former formal diagnosis of a psychiatric or psychological disorder
- A disorder affecting the capacity to understand and complete the study assessments

RESEARCH PROCEDURES, RISKS AND BENEFITS

A18. Give details of all non-clinical intervention(s) or procedure(s) that will be received by participants as part of the research protocol. *These include seeking consent, interviews, non-clinical observations and use of questionnaires.*

Please complete the columns for each intervention/procedure as follows:

2. If this intervention/procedure would be routinely given to participants as part of their care outside the research, how many of the total would be routine?
3. Average time taken per intervention/procedure (minutes, hours or days)
4. Details of who will conduct the intervention/procedure, and where it will take place

Intervention or procedure	1	2	3	4
Patient trial consent form	1	N/A	1 minute	Patient consent form for agreeing to participate in the intervention (created using NHS guidelines)
Research participant information sheet: Main trial	1	N/A	5 minutes	Information about taking part in the study (created using NHS guidelines)
Research participant information sheet: Pilot study	1	N/A	5 minutes	Information about taking part in the pilot study (created using NHS guidelines)
Patient questionnaire Pack: 6 questionnaires asking about patient characteristics, illness perception, treatment beliefs, psychological well-being and quality of life.	3	N/A	15 minutes	Completed as self-report measure by research participant at home (distributed by Chief Investigator)
Patient commonsense interview schedule: Asks theoretically derived questions to assess existing illness and treatment perceptions and gaps in participants knowledge	1	N/A	20 mins	Chief Investigator will conduct the interview in the patients home.
Action plan worksheet: Completed between participant and CI for participant to follow post-intervention to follow-up.	1	N/A	20minutes	Chief Investigator at patients home.
Patient study experience evaluation questionnaire Quantitative questionnaire to evaluate the pilot and RCT intervention in respect to process & benefits	1	N/A	10 minutes	Completed as self-report measure by research participant at home (distributed by Chief Investigator)

A19. Give details of any clinical intervention(s) or procedure(s) to be received by participants as part of the research protocol. *These include uses of medicinal products or devices, other medical treatments or assessments, mental health interventions, imaging investigations and taking samples of human biological material. Include procedures which might be received as routine clinical care outside of the research.*

Please complete the columns for each intervention/procedure as follows:

1. Total number of interventions/procedures to be received by each participant as part of the research protocol.
2. If this intervention/procedure would be routinely given to participants as part of their care outside the research, how many of the total would be routine?
3. Average time taken per intervention/procedure (minutes, hours or days).
4. Details of who will conduct the intervention/procedure, and where it will take place

Intervention or procedure	1	2	3	4
Urticaria Activity Score (UAS): Gold standard clinical measure of disease severity and activity in urticaria.	3	0-3	over 4-7 days	Completed by participant but scored anonymously by Dermatology team

A20. Will you withhold an intervention or procedure, which would normally be considered a part of routine care?

○ Yes ◉ No

A21. How long do you expect each participant to be in the study in total?

Each participant will be expected to be in the study for a minimum of 4 months. The time is broken down as follows:

- Baseline questionnaire assessment and UAS at home (1 week before intervention)
- Intervention sessions (once weekly sessions over 3 weeks)
- Post-intervention period (3 months)
- Questionnaire assessment and evaluation questionnaire completion (1 week)

The intervention may over run according to the participants own schedule and when they return the final assessment and evaluation questionnaires to the CI.

A22. What are the potential risks and burdens for research participants and how will you minimise them?

For all studies, describe any potential adverse effects, pain, discomfort, distress, intrusion, inconvenience or changes to lifestyle. Only describe risks or burdens that could occur as a result of participation in the research. Say what steps would be taken to minimise risks and burdens as far as possible.

•Intervention undertaken as a home visit

The intervention is proposed to occur within the participant's home environment for the dual benefit of both the participant and investigator. For the participant the intervention occurs in their own environment and removes the costs and inconvenience of having to travel to the hospital. For the investigator seeing participants at home increases the rate of recruitment and the intervention itself as it is presumed that potential participants are more likely to participate where the burden and effort of travel and costs have been removed. Secondly it also allows the investigator to undertake the trial intervention over a period of time that may not always be possible during the hours of a once weekly urticaria clinic. However some patients may find doing the intervention in their home intrusive or may not want other family members residing with them to know about their participation (or the intervention process). In the event of this happening, potential participants will have the opportunity to undertake the intervention in a private room or area at either St John's Institute of Dermatology at St Thomas Hospital or at the investigators educational/ working establishment, London Metropolitan University. All is clearly stated in the patient information sheet.

•Completing questionnaire pack and undertaking the commonsense interview

See A23.

•Challenging patient's illness and treatment perceptions

One of the main purposes of the intervention is to change illness perceptions specific to the participants existing negative and misconceived CU illness model. Some participants may continue to hold certain beliefs about CU that effect how they manage the condition and feel inclined to challenge the investigator. To avoid any possible conflicts between both parties (especially in the participant's home environment), the delivery of the intervention is undertaken within a person-centred framework promoting a collaborative partnership where the clinical researcher is supportive and attempts to create a positive atmosphere conductive to change. The responsibility to accommodate new information will remain with the patient not the researcher and therefore the patient is free to take or leave information and advice. The interventions main approach, the representational approach to patient education also facilitates conceptual change in the patient by working within their existing knowledge, as to providing generic information that the patient my find unhelpful or patronising.

•Confidentiality of personal and research data

It is clearly stated and explained in the patient information sheet that all patient personal and medical data will remain in the observation and presence of their usual care team. It is also stated that the investigator does not have access to patient files without their permission. Potential participants have the option of providing consent for the CI to obtain missing information such as missing socio-demographic and clinical characteristics data by ticking this option on the trials consent form. The patient information sheet informs potential participants that their research data will be anonymised by a study code number immediately after they have signed the consent form. Patient names, telephone numbers and addresses (provided to the CI by patient permission via the clinics admin staff) will remain in a password secured computer in the CI's educational establishment in her key secured office (see Q A-27 for more detail). Patients are informed on the information sheet that their questionnaire data is entered as numbers on a large statistical database and combined with the data of other participants to create an overall pattern of findings. Finally patients are informed that their interviews maybe voice recorded. Patients will be able to object to this without jeopardising their ability to take part. They will be informed however that any recorded information will be anonymised and destroyed once transcribed.

•Completing and Urticaria Activity Score diary (UAS)
The timing of completing the questionnaire pack is stated on the patient information sheet (approximately 15 minutes). The burden and timing of completing the questionnaire pack has already been evaluated in a previous study using a patient sample from St Thomas hospital proposed for the proposed study. The UAS is the gold standard measure of disease activity in CU patients and has been designed as a simple measure of the intensity of itch and size of wheals on the body over 4-7 days. It requires no writing up from the participants but scoring on a small scale (e.g. 0 - 3).

All participants will continue with their usual prescribed treatments during the trial regardless of being allocated to the intervention, control group or taking part in the pilot study.

References
Donovan, H.S. and Ward, S.E. (2001) A representational approach to patient education, Journal of Nursing Scholarship, 33 (3), 211-216

Donovan, H.S, Ward, S.E. and Song, M-K (2007) An update on the representational approach to patient education, Journal of Nursing Scholarship, 39 (3), 259-265

A23. Will interviews/ questionnaires or group discussions include topics that might be sensitive, embarrassing or upsetting, or is it possible that criminal or other disclosures requiring action could occur during the study?

(•) Yes ( ) No

If Yes, please give details of procedures in place to deal with these issues:
It is acknowledged that in certain cases the questions presented to participants in the questionnaire pack and during the commonsense interview may arouse particular negative emotions in relation to just how much CU has impacted on their lives. The participant initially will have the opportunity to withdraw from the study at any time if they wish and to be debriefed. If this is not enough the CI who is a trainee health psychologist (under the supervision of a qualified health psychologist)will allow extra time for the participant to have the opportunity to voice their feelings and concerns but not within a therapeutic capacity. In the rare occassion where the CI cannot help the participant to resolve their feelings and emotions the CI will seek the help of her supervisor. The participant will be made aware that they have the opportunity to contact their consultant dermatologist or GP to discuss further actions and will be sign-posted to the hospitals Patients Advice and Liaison Service (PALS)if required. Research participants also have access to London Metropolitan Universities complaints procedures (all are stated in the patient information sheet)

A24. What is the potential for benefit to research participants?

• Adjunct to medical care, patients increase their knowledge of their condition, not by the use of generic patient educational materials, but by filling in specific gaps in their knowledge identified by the investigator of the patient's own implicit 'commonsense theoretical model' of CU. Allowing the patient to identify gaps in their knowledge has been shown to increase conceptual change. A conceptual change may lead to behaviour change (i.e. better CU self-regulation and self-management) over time. Positive changes in CU health behaviours in themselves may lead to self-reports of reduced psychological distress and better quality of life (including fewer symptoms, better sleep and psycho-social interactions).

•Compliments and adds another evidence based dimension to existing biomedical models of CU as to opposing it.

A25. What arrangements are being made for continued provision of the intervention for participants, if appropriate, once the research has finished? *May apply to any clinical intervention, including a drug, medical device, mental health intervention, complementary therapy, physiotherapy, dietary manipulation, lifestyle change, etc.*

The intervention will not be available to participants after the trial because the proposed study is being undertaken as part fulfilment of the CI's PhD and is currently funded and sponsored by London Metropolitan University within this capacity. The participant will be made aware of the current status and terms of the intervention in the studies consent form and patient information sheet. However:

The nature of the intervention content is designed to be a complete procedure. The participant is provided with the psycho-education and self-management skills to allow for the facilitation of cognitive and behaviour change after the intervention is complete.

The results of the study will be made available to participants after the trial has come to a conclusion and has been

analysed.

A26. What are the potential risks for the researchers themselves? *(if any)*

It is proposed that the potential for adverse effects, risks or hazards, pain, discomfort or distress to the CI are assessed to be minimal.

Emotional

As the CI has been diagnosed with CU and has gone through the NHS treatment process via GP's, Dermatologists and other health professionals, she is aware that the study she has designed may conjure similar negative emotions and reflections as to those of her research participants. The CI will fully utilise the support and supervision of her academic supervisor (Dr Anna Baker) who also works in a clinical therapeutic capacity. The CI also has support from her network of other PhD and postgraduate student researchers who are also working in a similar capacity. The CI also has a large supportive network of close family and friends, many of whom are aware of the project and the CI's own medical diagnosis of CU. As a requirement to train as a Chartered Psychologist, the CI is required to keep a logbook of her personal experiences during the study process. This will provide a unique therapeutic opportunity to reflect upon these subjective personal experiences to an objective scientific process.

Competency to assess an deal with indentified hazards

The CI will be travelling, collecting data and undertaking the intervention in the community within the participant's own home environment. The CI has 10 years experience of working within the community and within potentially hazardous or violent environments. During her various previous employments the CI has worked as a learning disability support worker within a care home environment which required much time working alone with clients who had behavioural problems as well as mental health needs. As an assistant clinical psychologist the work involved a considerable amount of time assessing and undertaking therapy one-to-one with patients in isolation within mental health wards and within the client's home environment. The hazards of working alone are the same as for other health professionals working as home visitors. These have been identified as

1.Risk of injury due to violence or physical assault from the patient or relative
2.Assault whilst travelling within the community itself (especially with the CI being female)

These are more likely to depend upon/ more likely to occur:
a)In homes or areas that experience deprivation
b)The nature of the accommodation being visited (e.g. tower block)
c)The location
d)Time of day (especially at night or when it is dark)
e)The patient having a previous history of attacking NHS staff or other community workers
f)The patient having a criminal record related to physical violence or abuse
g)The patient having a history of mental health problems (however these patients are excluded under the studies selection criteria).
h)The patient has a history of alcohol or substance misuse
h)Female working with male patients

The CI will take these factors into consideration by first finding out the nature of the environment that she will be entering and let her supervisor know where she will be visiting, the time of the visit, how long the visit will be and when she is expected to return. The CI will make sure that she is contactable by a fully charged mobile phone as will the supervisor.

RECRUITMENT AND INFORMED CONSENT

In this section we ask you to describe the recruitment procedures for the study. Please give separate details for different study groups where appropriate.

A27-1. How will potential participants, records or samples be identified? Who will carry this out and what resources will be used? *For example, identification may involve a disease register, computerised search of GP records, or review of medical records. Indicate whether this will be done by the direct healthcare team or by researchers acting under*

Participants for the study will be identified either through the urticaria patient database within St John's Institute of Dermatology at St Thomas Hospital or during the patients dermatology appointment by their Consultant Dermatologist.

In the former, the clinics admin staff will have access to the patient database and will contact potential participants. The admin staff will ascertain if the patient agrees for their contact details to be passed on to the chief investigator to contact them about the study.

In the later the patient will be informed about the trial by their dermatologist in the clinic after the consultation. If visiting patients agree that they want to hear more about the study, the dermatologist or dermatological nurse will introduce the patient to the CI in the clinic. If the CI is not available, the participant will be provided with a research participant information sheet with the CI's contact details.

A27-2. Will the identification of potential participants involve reviewing or screening the identifiable personal information of patients, service users or any other person?

(•) Yes ( ) No

Please give details below:
The process will involve screening for the potential participants using the following information

1. Patient's primary diagnosis
2. Patient's name
3. Patient's telephone number
4. Patient's home dddress

All will be screened by the clinics admin staff as stated in A27-1 for patients accessed by the clinics database. The admin staff will contact potential participants and ask for permission for the CI to have their details for the sake of informing them about the study and a formal invitation.

Patients identified as potential participants in the clinic by the dermatologist will provide these details to the CI themselves if this is what they want to do.

A27-4. Will researchers or individuals other than the direct care team have access to identifiable personal information of any potential participants?

(•) Yes ( ) No

A27-5. Has prior consent been obtained or will it be obtained for access to identifiable personal information?

(•) Yes ( ) No

If Yes, please give details below.
The clinics administration staff will seek permission from potential participants to allow the CI to access their personal details. Patients in the clinic can give consent themselves to the CI in person

A28. Will any participants be recruited by publicity through posters, leaflets, adverts or websites?

(•) Yes ( ) No

If Yes, please give details of how and where publicity will be conducted, and enclose copy of all advertising material (with version numbers and dates).
An advertisement poster will be placed on the walls of the waiting room and reception area of St John's Institute of Dermatology at St Thomas Hospital. The poster is A3 in size and has the collaborating organisations (i.e. London Metropolitan University and Guy's and St Thomas' NHS Foundation Trust) logos placed at the top. The poster includes the studies title, a brief description of what the study is about, the inclusion criteria including age (18+) and

mobile phone number and CI's university office) and her contact address (university office). Finally the study has 3 photos: Two of chronic urticaria and one of a professional working with the patient in their home and a patient working on an activity on their own. All photos are licensed for use. A copy of the advertisement is included in this REC application.

A4 copies of the poster will also be kept in the waiting room and reception area of St John's Institute of Dermatology for distribution as flyers for potential participants.

A29. How and by whom will potential participants first be approached?

Urticaria Clinic:
These patients will be first approached by their Consultant Dermatologist during their clinic appointment. At the end of the patients' appointment the consultant will make the patient aware of the trial and determine their interest in finding out more information. If the patient is interested, they will be introduced to the CI by the consultant. The CI will describe the trial to the patient and what it involves. If the patient decides that they want to participate they will be given the patient information sheet to read and the consent form to sign. An appointment will be made for the first appointment plus a copy of the questionnaire pack and UAS will instructions of how to complete both.

Patient database:
These patients will be identified through the clinics urticaria database by the clinics administration staff who will seek permission from these patients to provide the CI with their names, phone numbers and address. Database patients will be recruited by phone by the CI, informed about the study and asked if they would be interested in taking part. Interested patients will have the study described to them further including what it will involve. If the patient decides that they want to participate they will be posted the PIS to read with the consent form to sign, the questionnaire pack to complete and the UAS. The CI will instruct the patient of how to complete the latter two and an appointment will be made for the first appointment.

A30-1. Will you obtain informed consent from or on behalf of research participants?

(●) Yes ( ) No

If you will be obtaining consent from adult participants, please give details of who will take consent and how it will be done, with details of any steps to provide information (a written information sheet, videos, or interactive material). Arrangements for adults unable to consent for themselves should be described separately in Part B Section 6, and for children in Part B Section 7.

If you plan to seek informed consent from vulnerable groups, say how you will ensure that consent is voluntary and fully informed.

N/A

If you are not obtaining consent, please explain why not.

Please enclose a copy of the information sheet(s) and consent form(s).

A30-2. Will you record informed consent (or advice from consultees) in writing?

(●) Yes ( ) No

A31. How long will you allow potential participants to decide whether or not to take part?

Participants will have 4 months prior to the studes estimated end date to decide whether or not to take part. This is because of the 3 month period required between the 1 week post intervention assessment and 1 week follow-up assessment. With the study needing to end in April 2010, the earliest time possible for participants to take part (including the 1 week basement assessment and 3 week intervention period) they will have until be early January to decide.

A32. Will you recruit any participants who are involved in current research or have recently been involved in any research prior to recruitment?

( ) Yes
(●) No
( ) Not Known

A33-1. What arrangements have been made for persons who might not adequately understand verbal explanations or written information given in English, or who have special communication needs? *(e.g. translation, use of interpreters)*

Patients who do not adequately understand verbal/ written explanations of information given in English or who have communicanication difficulties with be excluded because:

The project is being undertaken as part fulfilment of a PhD project and is of a limited budget. Organising and hiring interpreters is deemed outside of the realms of the project budjet. The PhD is also lime restricted and the use of interpreters will cause time delays in an already time consuming process.

A34. What arrangements will you make to ensure participants receive any information that becomes available during the course of the research that may be relevant to their continued participation?

Participants will simply be contacted by phone by the chief investigator who is the main source of contact during the study. Participants will have the opportunity to have additional updates by computer automated text message or emails if requested.

Participants will routinely be contacted by phone at certain time points in the study (e.g. prior to recieving the questionnaire packs, making appointments, arranging times for the debriefing and the evaluation).

A35. What steps would you take if a participant, who has given informed consent, loses capacity to consent during the study? *Tick one option only*

(●) The participant and all identifiable data or tissue collected would be withdrawn from the study. Data or tissue which is not identifiable to the research team may be retained.
( ) The participant would be withdrawn from the study. Identifiable data or tissue already collected with consent would be retained and used in the study. No further data or tissue would be collected or any other research procedures carried out on or in relation to the participant.
( ) The participant would continue to be included in the study.
( ) Not applicable – informed consent will not be sought from any participants in this research.

Further details:
Patients who lose the capacity to give informed consent during the study will be excluded. The intervention involves being assessed via interviews and completing questionnaires that are directly aimed at changing cognitions to facilitate behaviour change. A lost cognitive capacity may have an affect on the participants' ability to understand or cope with the intervention activities and confound the findings of outcome measures (e.g. anxiety, depression, quality of life).

CONFIDENTIALITY

In this section, personal data means any data relating to a participant who could potentially be identified. It includes pseudonymised data capable of being linked to a participant through a unique code number.

Storage and use of personal data during the study

A36. Will you be undertaking any of the following activities at any stage (including in the identification of potential participants)? *(Tick as appropriate)*

[ ] Access to medical records by those outside the direct healthcare team
[ ] Electronic transfer by magnetic or optical media, email or computer networks

[ ] Sharing of personal data with other organisations
[ ] Export of personal data outside the EEA
[x] Use of personal addresses, postcodes, faxes, emails or telephone numbers
[ ] Publication of direct quotations from respondents
[ ] Publication of data that might allow identification of individuals
[x] Use of audio/visual recording devices
[x] Storage of personal data on any of the following:

- [x] Manual files including X-rays
- [ ] NHS computers
- [ ] Home or other personal computers
- [x] University computers
- [ ] Private company computers
- [ ] Laptop computers

Further details:
The clinics admin team with provide the CI with the name and telephones numbers of potential research participants at the identification stage. The CI will not have direct access to patients files at this stage.

With the research participant's consent the CI will obtain additional information on patients files where it is relevant to the study (i.e. socio-demograpic and clinical charecteristics). Otherwise, patient files will remain in the responsibility and viewing of the patients normal healthcare professionals

A38. How will you ensure the confidentiality of personal data? *Please provide a general statement of the policy and procedures for ensuring confidentiality, e.g. anonymisation or pseudonymisation of data.*

Participants will be assigned a code number to be stored along their name and personal details on the CI's password secured PC at her educational Institution. The code number will placed on participant's questionnaire and written transcript data and used to identify a particular participant when discussing their data with others such as the CI's statistician or academic and clinical supervisors (e.g. participant ST01 meaning St Thomas Hospital patient number 1).

The ID code will be assigned as soon as the consent form is signed confirming that the patient is happy to participate.

As well as working within NHS Code of Confidentiality, the CI is also bound as a professional to the British Psychological Societies (BPS) Code of Ethics and Conduct under 'Ethical Principles for Conducting Research with Human Participants' as follows:

7.1 Subject to the requirements of legislation, including the Data Protection Act, information obtained about a participant during an investigation is confidential unless otherwise agreed in advance. Investigators who are put under pressure to disclose confidential information should draw this point to the attention of those exerting such pressure. Participants in psychological research have a right to expect that information they provide will be treated confidentially and, if published, will not be identifiable as theirs. In the event that confidentiality and/or anonymity cannot be guaranteed, the participant must be warned of this in advance of agreeing to participate.

A40. Who will have access to participants' personal data during the study? *Where access is by individuals outside the direct care team, please justify and say whether consent will be sought.*

Health records will be seen and remain within the patient's clinical team. Additional information required from patient files by the CI will be gained with the research participant's consent.

Storage and use of data after the end of the study

( ) Less than 3 months
( ) 3 – 6 months
(●) 6 – 12 months
( ) 12 months – 3 years
( ) Over 3 years

INCENTIVES AND PAYMENTS

A46. Will research participants receive any payments, reimbursement of expenses or any other benefits or incentives for taking part in this research?

( ) Yes (●) No

A47. Will individual researchers receive any personal payment over and above normal salary, or any other benefits or incentives, for taking part in this research?

( ) Yes (●) No

A48. Does the Chief Investigator or any other investigator/collaborator have any direct personal involvement (e.g. financial, share holding, personal relationship etc.) in the organisations sponsoring or funding the research that may give rise to a possible conflict of interest?

( ) Yes (●) No

NOTIFICATION OF OTHER PROFESSIONALS

A49-1. Will you inform the participants' General Practitioners (and/or any other health or care professional responsible for their care) that they are taking part in the study?

(●) Yes ( ) No

If Yes, please enclose a copy of the information sheet/letter for the GP/health professional with a version number and date.

A49-2. Will you seek permission from the research participants to inform their GP or other health/ care professional?

(●) Yes ( ) No

It should be made clear in the participant's information sheet if the GP/health professional will be informed.

PUBLICATION AND DISSEMINATION

A50. Will the research be registered on a public database?

(●) Yes ( ) No

Please give details, or justify if not registering the research.
Upon approval by research ethics and Guy's R&D, the research will be registered with ISRCTN register at www.controlled-trials.com

trials worldwide.

A51. How do you intend to report and disseminate the results of the study? *Tick as appropriate:*

- [x] Peer reviewed scientific journals
- [x] Internal report
- [x] Conference presentation
- [ ] Publication on website
- [ ] Other publication
- [ ] Submission to regulatory authorities
- [ ] Access to raw data and right to publish freely by all investigators in study or by Independent Steering Committee on behalf of all investigators
- [ ] No plans to report or disseminate the results
- [ ] Other (please specify)

A53. Will you inform participants of the results?

(●) Yes ( ) No

Please give details of how you will inform participants or justify if not doing so.
Participants will be provided with a 1500 word summary report of the studies main findings when they become available.

Participants will also be made aware that the results will be presented to scientific journals for publishing. Identified journals for possible publication submission include:

British Journal of Health Psychology
British Journal of Dermatology
Psychology, Health and Medicine
Psychology and Health
Journal of Investigative Dermatology
European Journal of Dermatology
Journal of the European Academy of Allergy and Asthma Venereology

9. Scientific and Statistical Review

A54. How has the scientific quality of the research been assessed? *Tick as appropriate:*

- [ ] Independent external review
- [ ] Review within a company
- [ ] Review within a multi-centre research group
- [x] Review within the Chief Investigator's institution or host organisation
- [ ] Review within the research team
- [x] Review by educational supervisor
- [ ] Other

Justify and describe the review process and outcome. If the review has been undertaken but not seen by the researcher, give details of the body which has undertaken the review:
The study being proposed for review has been approaved by the Chief Investigators Academic Supervisor Dr Anna Baker who is an expert in the field and theoretical framework relevant to the project (as the Course Leader for the MSc, PhD and the professional Doctorate in Health Psychology). The study has also been approved by the institutions Head of Psychology (Dr Liz Charman) and the Universities Research Degrees Board who monitor PhD's. The University Research Degrees Board acts independently of the CI's research and deemed the study as a contributor to the overall PhD level of the project. A registration application form was completed in detail and fowarded to the committee and

signed by the above named supervisor and head of Psychology. Ongoing reviews of the scientific quality of the study will be undertaken by the primary academic supervisor and second supervisor (Dr Joanne Lusher), other appropriate members of the psychology department as agreed by the academic supervisors and by the Research Degrees Committe Board.

For all studies except non-doctoral student research, please enclose a copy of any available scientific critique reports, together with any related correspondence.

For non-doctoral student research, please enclose a copy of the assessment from your educational supervisor/ institution

A56. How have the statistical aspects of the research been reviewed? *Tick as appropriate:*

- [ ] Review by independent statistician commissioned by funder or sponsor
- [ ] Other review by independent statistician
- [ ] Review by company statistician
- [x] Review by a statistician within the Chief Investigator's institution
- [ ] Review by a statistician within the research team or multi-centre group
- [x] Review by educational supervisor
- [ ] Other review by individual with relevant statistical expertise
- [ ] No review necessary as only frequencies and associations will be assessed – details of statistical input not required

In all cases please give details below of the individual responsible for reviewing the statistical aspects. If advice has been provided in confidence, give details of the department and institution concerned.

	Title	Forename/Initials	Surname
	Dr	Simon	Moore
Department	School of Psychology, Faculty of Life Sciences		
Institution	London Metropolitan University		
Work Address	City Campus, Culcutta House		
	Old Castle Street		
	London		
Post Code	E1 7NT		
Telephone	02073202359		
Fax	02071334149		
Mobile			
E-mail	s.moore@londonmet.ac.uk		

Please enclose a copy of any available comments or reports from a statistician

A57. What is the primary outcome measure for the study?

The first primary outcome of the study is to measure changes in illness and treatment perception components at post-intervention and 3-months post intervention follow-up as measured by the

- The revised Illness perception questionnaire
- Beliefs about medicines questionnaire

The second primary outcome of the study will be to measure changes in the 6 key components of CU-related quality of life outcome (i.e. anxiety, depression general physical health status, general mental health status and overall disease-specific quality of life) at post-intervention and 3 months post-intervention follow-up as measured by the

- Hospital Anxiety and Depression Scale (Zigmond and Snaith, 1983)

-The MOS 36-Item Short Form Health Survey UK version2 (Ware and Sherbourne, 1992) mental and physical

component summary scales

- Chronic Urticaria Quality of Life Questionnaire (Balardini,Pasquali,Braldo et al, 2005), overall transformed score

-Urticaria Activity Score

A58. What are the secondary outcome measures? *(if any)*

The first secondary outcome of the study is to qualitatively explore CU patient's baseline commonsense representations of their illness using the techniques of interpretive phenomenological analysis

The final secondary outcome of the study is to quantitatively evaluate the patient study experience over the course of the intervention as set out in the patient's intervention experience questionnaire (included in application)

A59. What is the sample size for the research? *How many participants/samples/data records do you plan to study in total? If there is more than one group, please give further details below.*

Total UK sample size:	72
Total international sample size (including UK):	0
Total in European Economic Area:	0

Further details:
- Main study: 62 participants (31 intervention group, 31 usual care control group)

- Pilot study: 10 participants (not included in power analysis calculation)

A60. How was the sample size decided upon? *If a formal sample size calculation was used, indicate how this was done, giving sufficient information to justify and reproduce the calculation*

The estimated sample size for the main study will be 62 participants (i.e. 31 in the intervention group and 31 in the control group). This was undertaken with the computer programme G Power 3 (Buchner, Erdfelder and Faul, 1997). The sample size for the main study was calculated for a MANOVA (repeated measures with within-between group interactions), looking for a medium effect size of 0.5 (Cohen, 1992), a power of 0.8 (recommended for psychological research; Field, 2010) and a probability value of .05 on a criteria of 2 comparison groups and 7 measurements per participant per condition.

The pilot study will recruit 10 participants to test and evaluate the feasibility of the study

A61. Will participants be allocated to groups at random?

(●) Yes ( ) No

If yes, please give details of the intended method of randomisation:
The RCT study will use a combination of simple and block randomisation. Block randomisation allows for the intervention to proceed along a continuing parallel recruitment procedure in a staggered manner. The CI will not be included in the randomisation process but due to the nature of psychological based investigations the CI cannot be blind to the treatment group allocation process. The CI also has to undertake the intervention as a part of her PhD training. Patients will be randomised in blocks of 6. Simple randomisation will be used to choose proceeding blocks via a computer programme

A62. Please describe the methods of analysis (statistical or other appropriate methods, e.g. for qualitative research) by which the data will be evaluated to meet the study objectives.

The study data will be analysed on an 'intention to treat' basis meaning that all patients recruited into the study are analysed regardless of attrition over the study. Quantitative data will be analysed using the SPSS 18 statistical software package.

Preliminary exploratory data analysis:

•Independent samples T-tests and chi-square analysis will be used to assess any potential differences in patient characteristics between groups at study baseline and differences between responders verses non-responders.

•Descriptive statistics will be used to test parametric statistical assumptions and describe the study variables in the sample.

Main study research aims:

1. To determine whether a self-regulatory intervention has an immediate effect on changing illness perceptions in CU patients.
2. To establish if the effect of changing patients' implicit model of CU persists at 3 months post intervention from baseline and post intervention reports.

•A mixed multivariate analysis of variance (MANOVA) will be used to examine the perception components post-intervention and follow-up. These will be followed up by standard analysis of co-variance (ANCOVA) for each representation plus post hoc tests and discriminate functional analyses. Because a large number of comparisons will be made a Bonferroni correction for multiple tests will be applied to the significance criterion of .05 to reduce the chance of making a type-1 error.

3. To determine if the self-regulatory intervention has an immediate effect on self-reported CU-related outcomes.
4. To establish if the effect on self-reported CU outcomes persist at 3 month follow-up when compared to baseline reports.

•A mixed multivariate analysis of variance (MANOVA) will be used to compare the intervention and control group on the 6 indicators of CU-related outcome at post-intervention and 3 month follow-up. These will be followed by standard analysis of variance (ANOVA) for each outcome with a Bonferroni correction applied to the data.

•Patients' post-intervention improvement outcome scores of 1.96 standard deviations from the mean of those in the control group will be taken to indicate a clinical significant change (or CSC) in that patient

5. To qualitatively explore CU patients baseline commonsense representations of their illness

•Interpretive phenomenological analysis (IPA) will be used to qualitatively analyse data from the patient interview.

6. To evaluate the patient study experience over the course of the intervention

Descriptive statistics in the form of means and percentages will be used to analyse the responses of study participants on the evaluation questionnaire.

9. MANAGEMENT OF THE RESEARCH

A63. Other key investigators/collaborators. *Please include all grant co applicants, protocol co authors and other key members of the Chief Investigator's team, including non-doctoral student researchers.*

	Title	Forename/Initials	Surname
	Dr	Anna	Baker
Post	Principal Lecturer/ Course Leader in Health Psychology		
Qualifications	MA PhD PG Dip		
Employer	School of Psychology, Faculty of Life Sciences, London Metropolitan University		
Work Address	City Campus, Culcutta House		
	Old Castle Street		

Post Code	E1 7NT
Telephone	02073202397
Fax	02073201236
Mobile	
Work Email	d.baker@londonmet.ac.uk

Title	Forename/Initials	Surname
Dr	Clive E	Grattan

Post	Consultant Dermatologist
Qualifications	MA, MB, BChir, MRCP, FRCP, MD, ILT
Employer	Cutaneous Allery, Guys and St. Thomas Foundation Hospitals NHS Trust
Work Address	3rd Floor, St Johns Institute of Dermatology, St Thomas Hospital Lambeth Palace Rd, City of London
Post Code	SE1 7EH
Telephone	02071881613
Fax	02071887473
Mobile	
Work Email	Clive E Grattan@gstt.nhs.uk

A64. Details of research sponsor(s)

A64-1. Sponsor

Lead Sponsor

Status:
- ○ NHS or HSC care organisation
- ◉ Academic
- ○ Pharmaceutical industry
- ○ Medical device industry
- ○ Local Authority
- ○ Other social care provider (including voluntary sector or private organisation)
- ○ Other

Commercial status:

If Other, please specify:

Contact person

Name of organisation	London Metropolitan University
Given name	Elizabeth
Family name	Charman
Address	School of Psychology, Faculty of Life Sciences, City Campus, Calcutta House, Old Castle Street
Town/city	London
Post code	E1 7NT
Country	UNITED KINGDOM
Telephone	02073201078
Fax	02071334149
E-mail	e.charman@londonmet.ac.uk

Is the sponsor based outside the UK?
○ Yes ◉ No

Under the Research Governance Framework for Health and Social Care, a sponsor outside the UK must appoint a legal representative established in the UK. Please consult the guidance notes.

A67. Has this or a similar application been previously rejected by a Research Ethics Committee in the UK or another country?

○ Yes ◉ No

Please provide a copy of the unfavourable opinion letter(s). You should explain in your answer to question A6-2 how the reasons for the unfavourable opinion have been addressed in this application.

A68. Give details of the lead NHS R&D contact for this research:

Title	Forename/Initials	Surname
Ms	Samantha	Roper

Organisation	Guy's And St Thomas' NHS Foundation Trust
Address	Research and Development Department 16th Floor, Tower Wing, Guy's Hospital Great Maze Pond, London
Post Code	SE1 9RT
Work Email	samantha.roper@gstt.nhs.uk
Telephone	020 7188 7188
Fax	020 7188 8330
Mobile	

Details can be obtained from the NHS R&D Forum website: http://www.rdforum.nhs.uk

A69-1. How long do you expect the study to last in the UK?

Planned start date: 28/07/2011
Planned end date: 05/04/2012
Total duration:
Years. 0 Months. 9 Days. 0

A71-1. Is this study?

◉ Single centre
○ Multicentre

A71-2. Where will the research take place? *(Tick as appropriate)*

☑ England
☐ Scotland
☐ Wales

☐ Northern Ireland
☐ Other countries in European Economic Area

Total UK sites in study 2

Does this trial involve countries outside the EU?
○ Yes ◉ No

A72. What host organisations (NHS or other) in the UK will be responsible for the research sites? *Please indicate the type of organisation by ticking the box and give approximate numbers of planned research sites:*

- ☑ NHS organisations in England
- ☐ NHS organisations in Wales
- ☐ NHS organisations in Scotland
- ☐ HSC organisations in Northern Ireland
- ☐ GP practices in England
- ☐ GP practices in Wales
- ☐ GP practices in Scotland
- ☐ GP practices in Northern Ireland
- ☐ Social care organisations
- ☐ Phase 1 trial units
- ☐ Prison establishments
- ☐ Probation areas
- ☐ Independent hospitals
- ☑ Educational establishments
- ☐ Independent research units
- ☐ Other (give details)

Total UK sites in study: 0

A75-1. Will a data monitoring committee (DMC) be convened?

○ Yes ◉ No

If Yes, please forward details of the membership of the DMC, its standard operating procedures and summary reports of interim analyses to the Research Ethics Committee which gives a favourable opinion of the study (or to GTAC if applicable).

A75-2. What are the criteria for electively stopping the trial or other research prematurely?

The CI is suspended from her course of PhD study
This is highly unlikely as the study being submitted is the final in a series of PhD investigations already completed.

A76. Insurance/ indemnity to meet potential legal liabilities

Note: In this question to NHS indemnity schemes include equivalent schemes provided by Health and Social Care (HSC) in Northern Ireland

A76-1. What arrangements will be made for insurance and/or indemnity to meet the potential legal liability of the sponsor(s) for harm to participants arising from the management of the research? *Please tick box(es) as applicable.*

Note: Where a NHS organisation has agreed to act as sponsor or co-sponsor, indemnity is provided through NHS schemes.

arrangements and provide evidence.

☐ NHS indemnity scheme will apply (NHS sponsors only)
☑ Other insurance or indemnity arrangements will apply (give details below)

The Chief Investigators academic institution London Metropolitan University will be responsible for insurance and/ or indemnity to reach potential legal liabilities in this context.

Please enclose a copy of relevant documents.

A76-2. What arrangements will be made for insurance and/ or indemnity to meet the potential legal liability of the sponsor(s) or employer(s) for harm to participants arising from the design of the research? *Please tick box(es) as applicable.*

Note. Where researchers with substantive NHS employment contracts have designed the research, indemnity is provided through NHS schemes. Indicate if this applies (there is no need to provide documentary evidence). For other protocol authors (e.g. company employees, university members), please describe the arrangements and provide evidence.

☐ NHS indemnity scheme will apply (protocol authors with NHS contracts only)
☑ Other insurance or indemnity arrangements will apply (give details below)

The Chief Investigators academic institution London Metropolitan University will be responsible for insurance and/ or indemnity to reach potential legal liabilities in this context.

Please enclose a copy of relevant documents.

A76-3. What arrangements will be made for insurance and/ or indemnity to meet the potential legal liability of investigators/collaborators arising from harm to participants in the conduct of the research?

Note. Where the participants are NHS patients, indemnity is provided through the NHS schemes or through professional indemnity. Indicate if this applies to the whole study (there is no need to provide documentary evidence). Where non-NHS sites are to be included in the research, including private practices, please describe the arrangements which will be made at these sites and provide evidence.

☑ NHS indemnity scheme or professional indemnity will apply (participants recruited at NHS sites only)
☐ Research includes non-NHS sites (give details of insurance/ indemnity arrangements for these sites below)

All patients are recruited from an NHS site so indemnity in this context will be provided by the NHS indemnity scheme.

Please enclose a copy of relevant documents.

A77. Has the sponsor(s) made arrangements for payment of compensation in the event of harm to the research participants where no legal liability arises?

○ Yes ◉ No

Please enclose a copy of relevant documents.

PART C: Overview of research sites

Please enter details of the host organisations (Local Authority, NHS or other) in the UK that will be responsible for the research sites. *For NHS sites, the host organisation is the Trust or Health Board. Where the research site is a primary care site, e.g. GP practice, please insert the host organisation (PCT or Health Board) in the Institution row and insert the research site (e.g. GP practice) in the Department row.*

Research site		Investigator/ Collaborator/ Contact	
Institution name	Guy's and St Thomas' NHS Foundation Trust	Title	Dr
Department name	Cutaneous Allergy	First name/ Initials	Clive E.
Street address	Lambeth Place	Surname	Grattan
Town/city	London		
Post Code	SE1 7EH		
Institution name	London Metropolitan University	Title	Ms
Department name	School of Psychology	First name/ Initials	Delaney
Street address	Old Castle Street	Surname	Bucknor
Town/city	London		
Post Code	E1 7NT		

PART D: Declarations

D1. Declaration by Chief Investigator

1. The information in this form is accurate to the best of my knowledge and belief and I take full responsibility for it.
2. I undertake to abide by the ethical principles underlying the Declaration of Helsinki and good practice guidelines on the proper conduct of research.
3. If the research is approved I undertake to adhere to the study protocol, the terms of the full application as approved and any conditions set out by review bodies in giving approval.
4. I undertake to notify review bodies of substantial amendments to the protocol or the terms of the approved application, and to seek a favourable opinion from the main REC before implementing the amendment.
5. I undertake to submit annual progress reports setting out the progress of the research, as required by review bodies.
6. I am aware of my responsibility to be up to date and comply with the requirements of the law and relevant guidelines relating to security and confidentiality of patient or other personal data, including the need to register when necessary with the appropriate Data Protection Officer. I understand that I am not permitted to disclose identifiable data to third parties unless the disclosure has the consent of the data subject or, in the case of patient data in England and Wales, the disclosure is covered by the terms of an approval under Section 251 of the NHS Act 2006.
7. I understand that research records/data may be subject to inspection by review bodies for audit purposes if required.
8. I understand that any personal data in this application will be held by review bodies and their operational managers and that this will be managed according to the principles established in the Data Protection Act 1998.
9. I understand that the information contained in this application, any supporting documentation and all correspondence with review bodies or their operational managers relating to the application:
   - Will be held by the main REC or the GTAC (as applicable) until at least 3 years after the end of the study; and by NHS R&D offices (where the research requires NHS management permission) in accordance with the NHS Code of Practice on Records Management.
   - May be disclosed to the operational managers of review bodies, or the appointing authority for the main REC, in order to check that the application has been processed correctly or to investigate any complaint.
   - May be seen by auditors appointed to undertake accreditation of RECs.
   - Will be subject to the provisions of the Freedom of Information Acts and may be disclosed in response to requests made under the Acts except where statutory exemptions apply.
10. I understand that information relating to this research, including the contact details on this application, may be held on national research information systems, and that this will be managed according to the principles established in the Data Protection Act 1998.
11. I understand that the main REC or its operational managers may share information in this application or supporting documentation with the Medicines and Healthcare products Regulatory Agency (MHRA) where it is relevant to the Agency's statutory responsibilities.
12. I understand that the summary of this study will be published on the website of the National Research Ethics Service (NRES), together with the contact point for enquiries named below. Publication will take place no earlier than 3 months after issue of the ethics committee's final opinion or the withdrawal of the application.

Contact point for publication *(Not applicable for R&D Forms)*

NRES would like to include a contact point with the published summary of the study for those wishing to seek further information. We would be grateful if you would indicate one of the contact points below.

- [x] Chief Investigator
- [ ] Sponsor
- [ ] Study co-ordinator
- [ ] Student
- [ ] Other – please give details
- [ ] None

Access to application for training purposes *(Not applicable for R&D Forms)*

Optional – please tick as appropriate:

[ ] I would be content for members of other RECs to have access to the information in the application in confidence for training purposes. All personal identifiers and references to sponsors, funders and research units would be removed.

Signature: .....

Print Name: Ms Delaney Bucknor

Date: 27/05/2011 *(dd/mm/yyyy)*

D2. Declaration by the sponsor's representative

If there is more than one sponsor, this declaration should be signed on behalf of the co-sponsors by a representative of the lead sponsor named at A64-1

I confirm that:

1. This research proposal has been discussed with the Chief Investigator and agreement in principle to sponsor the research is in place.
2. An appropriate process of scientific critique has demonstrated that this research proposal is worthwhile and of high scientific quality.
3. Any necessary indemnity or insurance arrangements, as described in question A76, will be in place before this research starts. Insurance or indemnity policies will be renewed for the duration of the study where necessary.
4. Arrangements will be in place before the study starts for the research team to access resources and support to deliver the research as proposed.
5. Arrangements to allocate responsibilities for the management, monitoring and reporting of the research will be in place before the research starts.
6. The duties of sponsors set out in the Research Governance Framework for Health and Social Care will be undertaken in relation to this research.
7. I understand that the summary of this study will be published on the website of the National Research Ethics Service (NRES), together with the contact point for enquiries named in this application. Publication will take place no earlier than 3 months after issue of the ethics committee's final opinion or the withdrawal of the application.

Signature: .....

Print Name: Dr Elizabeth Charman

Post: Head of Psychology Department

Organisation: London Metropolitan University

Date: *(dd/mm/yyyy)*

D3. Declaration for student projects by academic supervisor(s)

1. I have read and approved both the research proposal and this application. I am satisfied that the scientific content of the research is satisfactory for an educational qualification at this level.

2. I undertake to fulfil the responsibilities of the supervisor for this study as set out in the Research Governance Framework for Health and Social Care.

3. I take responsibility for ensuring that this study is conducted in accordance with the ethical principles underlying the Declaration of Helsinki and good practice guidelines on the proper conduct of research, in conjunction with clinical supervisors as appropriate.

4. I take responsibility for ensuring that the applicant is up to date and complies with the requirements of the law and relevant guidelines relating to security and confidentiality of patient and other personal data, in conjunction with clinical supervisors as appropriate.

Academic supervisor 1

This section was signed electronically by Anna Baker on 28/05/2011 06:06.

Job Title/Post:	Principal Lecturer
Organisation:	London Metropolitan University
Email:	a.baker@londonmet.ac.uk

NHS REC Form | Reference: 11/LO/0901 | IRAS Version 3.1

NHS
National Research Ethics Service
NRES Committee London - Hampstead
Northwick Park Hospital REC Centre
Level 7, Maternity Block
Northwick Park Hospital
Watford Road
Harrow
Middx HA1 3UJ

Telephone: 020 8869 2915
Facsimile: 020 8869 5222

12 August 2011

Ms Delaney A Bucknor
PhD Researcher/ Trainee Health Psychologist
School of Psychology, Life Sciences,
London Metropolitan University
London Metropolitan University
City Campus, Calcutta House
Old Castle Street,
London E1 7NT

Dear Ms Bucknor

Study title: **Changing Illness Perceptions in Chronic Spontaneous Urticaria to Improve Quality of Life Outcomes: A Pilot Study and Randomised Controlled Trial Intervention**

REC reference: **11/LO/0901**

Thank you for your letter of 19 June 2011, responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information has been considered on behalf of the Committee by the Chair.

Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised, subject to the conditions specified below.

Ethical review of research sites

NHS sites

The favourable opinion applies to all NHS sites taking part in the study, subject to management permission being obtained from the NHS/HSC R&D office prior to the start of the study (see "Conditions of the favourable opinion" below).

Non-NHS sites

The Committee has not yet been notified of the outcome of any site-specific assessment (SSA) for the non-NHS research site(s) taking part in this study. The favourable opinion does not therefore apply to any non-NHS site at present. We will write to you again as soon as one Research Ethics Committee has notified the outcome of a SSA. In the meantime no study procedures should be initiated at non-NHS sites.

Conditions of the favourable opinion

The favourable opinion is subject to the following conditions being met prior to the start of the study.

Management permission or approval must be obtained from each host organisation prior to the start of the study at the site concerned.

Management permission ("R&D approval") should be sought from all NHS organisations involved in the study in accordance with NHS research governance arrangements.

Guidance on applying for NHS permission for research is available in the Integrated Research Application System or at http://www.rdforum.nhs.uk.

Where a NHS organisation's role in the study is limited to identifying and referring potential participants to research sites ("participant identification centre"), guidance should be sought from the R&D office on the information it requires to give permission for this activity.

For non-NHS sites, site management permission should be obtained in accordance with the procedures of the relevant host organisation.

Sponsors are not required to notify the Committee of approvals from host organisations

It is the responsibility of the sponsor to ensure that all the conditions are complied with before the start of the study or its initiation at a particular site (as applicable).

Approved documents

The final list of documents reviewed and approved by the Committee is as follows:

Document	*Version*	*Date*
Advertisement	1	24 May 2011
Covering Letter		01 June 2011
Evidence of insurance or indemnity		17 May 2011
GP/Consultant Information Sheets	1	22 March 2011
Interview Schedules/Topic Guides	1	13 April 2011
Investigator CV	Ms Delaney Bucknor	22 May 2011
Letter from Sponsor	Dr Elizabeth Charman	23 May 2011
Letter from Statistician	Dr Simon Moore	24 May 2011
Letter of invitation to participant	1	20 January 2011
Other: Letter from Funder	Dr Elizabeth Charman	23 May 2011
Other: Study Evaluation Questionnaire - Non-validated questionnaire	1	20 April 2011
Other: Study intervention instruction manual	1	30 April 2011
Other: Goal Sheeting worksheet	1	22 April 2011
Other: Questionnaire pack	1.1	13 July 2011
Participant Consent Form	1	12 May 2011
Participant Consent Form	1.1, tracked changes	13 July 2011
Participant Information Sheet: PIS for Pilot study	1	16 May 2011
Participant Information Sheet	1.1, tracked changes	13 July 2011
Protocol	1.1, tracked changes	13 July 2011
Questionnaire: Revised Illness Perception - Validated Questionnaire		
Questionnaire: Beliefs about Medicines - Validated Questionnaire		
Questionnaire: Hospital Anxiety and Depression Scale - Validated Questionnaire		
Questionnaire: MOS 36-Item Short Form Health	UK v 2	

Survey		
Questionnaire: Chronic Urticaria Quality of Life - Validated Questionnaire		
Questionnaire: Urticaria Activity Score - Validated Questionnaire		
Questionnaire: You and your Urticaria Questionnaire - Non-validated questionnaire	1	12 May 2011
REC application		27 May 2011
Referees or other scientific critique report	Dr Anna Baker	27 May 2011
Response to Request for Further Information	from Ms Delaney Bucknor	19 June 2011

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees (July 2001) and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

After ethical review

Reporting requirements

The attached document *"After ethical review – guidance for researchers"* gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

- Notifying substantial amendments
- Adding new sites and investigators
- Notification of serious breaches of the protocol
- Progress and safety reports
- Notifying the end of the study

The NRES website also provides guidance on these topics, which is updated in the light of changes in reporting requirements or procedures.

Feedback

You are invited to give your view of the service that you have received from the National Research Ethics Service and the application procedure. If you wish to make your views known please use the feedback form available on the website.

Further information is available at National Research Ethics Service website > After Review

11/LO/0901	**Please quote this number on all correspondence**

With the Committee's best wishes for the success of this project

Yours sincerely

Dr Michael Pegg
Chair

Email: alkabhayani@nhs.net

Enclosures: "After ethical review – guidance for researchers" *[SL-AR2]*

Guy's and St Thomas' NHS
NHS Foundation Trust

Research & Development
16th Floor Tower Wing
Guy's Hospital
Great Maze Pond
London SE1 9RT
Tel: 020 7188 7188

Dr Clive Grattan
Consultant Dermatologist
Guy's and St Thomas' NHS Foundation Trust
Cutaneous Allergy, St. John's Institute of Dermatology
3rd Floor, St. Thomas' Hospital
Lambeth Palace Rd, City of London
SE1 7EH

29/09/2011

Dear Dr Grattan

Title: Changing Illness Perceptions in Chronic Spontaneous Urticaria to Improve Quality of Life Outcomes: A Pilot Study and Randomised Controlled Trial Intervention

In accordance with the Department of Health's Research Governance Framework for Health and Social Care, all research projects taking place within the Trust must receive a favourable opinion from an ethics committee and approval from the Department of Research and Development (R&D) prior to commencement.

- **Ethics Number:** 11/LO/0901
- **Sponsor:** London Metropolitan University
- **End Date:** 26/04/2012
- **Protocol:** Version 1.1, 13/07/2011
- **Site:** GSTFT
- **R&D Approval Date:** 29/09/2011
- **Chief Investigator:** Miss Delany Bucknor

NHS permission for the above research has been granted on the basis described in the application form, protocol and supporting documentation as listed in the ethics letter of favourable opinion letter dated 02/06/2011. I am pleased to inform you that we are approving the work to proceed within Guy's and St Thomas' NHS Foundation Trust and that the study has been allocated the Trust R&D registration number RJ111/N276. Please quote the R&D registration number in any communications with the R&D Department regarding your project.

Conditions of Approval:

- The principal investigator must ensure that the recruitment figures are reported.
- The principal investigator must notify R&D of the actual end date of the project.
- R&D must be notified of any changes to the protocol prior to implementation.
- The project must follow the agreed protocol and be conducted in accordance with all Trust Policies and Procedures especially those relating to research and data management.
- Members of the research team must have appropriate substantive or honorary contracts with the Trust prior to the study commencing. Any additional researchers who join the study at a later stage must also hold a suitable contract.

Data Protection:
Please ensure that you are aware of your responsibilities in relation to The Data Protection Act 1998, NHS Confidentiality Code of Practice, NHS Caldicott Report and Caldicott Guardians, the Human Tissue Act 2004, Good Clinical Practice, the NHS Research Governance Framework for Health and Social Care, Second Edition April 2005 and any further legislation released during the time of this study.

The Principal Investigator is responsible for ensuring that Data Protection procedures are observed throughout the course of the project.

If the project is a clinical trial under the European Union Clinical Trials Directive the following must also be complied with:

1. The EU Directive on Clinical Trials (Directive 2001/20/EC) and UK's implementation of the Directive: The Medicines for Human Use (Clinical Trials) Regulations 2004;
2. The EU Directive on Principles and Guidelines for Good Clinical Practice (EU Commission Directive 2005/28/EC); and UK's implementation of the Directive: The Medicines for Human Use (Clinical Trials) Amendment Regulations 2006;
3. If a clinical trials team has to keep a subject in a department "out of hours" for whatever reason, the Senior Nurse for the Hospital should be informed of their presence – as should the Resuscitation Team.

Amendments:
Please ensure that you submit a copy of any amendments made to this study to the R&D Department.

ISRCTN registration:
If appropriate it is recommended that you register with the Current Controlled Trials website http://isrctn.org/. Find out more about registering for an International Standard Randomised Controlled Trial Number (ISRCTN) as part of the Portfolio application process. Non-commercial studies with an interventional component that are eligible for NIHR CRN support can register for an ISRCTN for free via the Portfolio Database.

Annual Progress Report:
It is obligatory that an annual report is submitted by the Chief Investigator to the research ethics committee, and we ask that a copy is sent to the R&D Department. The yearly period commences from the date of receiving a favourable opinion from the ethics committee.

Please submit a copy of the progress report on the anniversary of the Ethics favourable opinion (2nd June)

Should you require any further information please do not hesitate to contact us.

Thank you for registering your research project.

Yours sincerely

Janahi Visakan
R&D Co-ordinator

c: Miss Delany Bucknor

AON RISK SERVICES

Somerset House
17-49 London Road
Redhill
Surrey RH1 1LU
t: 01737 783600
f: 01737 783700/1

Our ref: PITWIMC10-11/MLD
Direct Line: 01737 783633
Fax: 01737 783702
E-mail: malcolm.l.dent@aon.co.uk

5th August 2010

TO WHOM IT MAY CONCERN

We act as insurance brokers for London Metropolitan University and write to confirm details of the Professional Indemnity policy in force. This cover includes:

Limit of Indemnity	Any one occurrence and in the aggregate	£5,000,000
	Seepage, pollution and contamination in the aggregate	£1,000,000
	Prosecution defence costs in the aggregate	£100,000
Period of Insurance:		1st August 2010 to the 31st July 2011
Excess		£5,000 Excess for each and every loss
Insurer		Royal & Sun Alliance Insurance plc
Policy Number		RKK423027

This letter is provided for you as a matter of information only. The issuing of this document does not make the person or organisation to which it has been issued an additional Insured, nor does it modify in any manner the Contracts of Insurance between the Insured and Insurers. Any amendment, change or extension of such contracts can only be effected by specific endorsements attached thereto.

Yours faithfully

MALCOLM DENT
CLIENT SERVICE ADVISOR

For and on behalf of Aon Limited

ZURICH MUNICIPAL

Zurich Municipal
Zurich House
2 Gladiator Way
Farnborough
GU14 6GB

Telephone 0870 2418050

Direct phone 01252 387877
Direct fax 01252 375893
Email: claire.purdy@uk.zurich.com

. To Whom It May Concern

Our ref: DD/IND 29 July 2010

Zurich Municipal Customer: London Metropolitan University

This is to confirm that London Metropolitan University have in force with this Company until the policy expiry on 31 July 2011 Insurance incorporating the following essential features:

Policy Number: NHE-01CA24-0013

Limit of Indemnity:

Public Liability:	£ 30,000,000	any one event
Products Liability: Pollution:	£ 30,000,000	for all claims in the aggregate during any one period of insurance
Employers' Liability:	£ 30,000,000	any one event inclusive of costs

Excess :

Public Liability/Products Liability/Pollution:	£ 250 any one event
Employers' Liability:	Nil any one claim

Indemnity to Principals :
Covers include a standard Indemnity to Principals Clause in respect of contractual obligations.

Full Policy :
The policy documents should be referred to for details of full cover.

Yours faithfully

PP. [signature]

Claire Purdy
Underwriting Services
Zurich Municipal
Farnborough

G7153.C2 (100052AC2) 1502 MCN

LONDON metropolitan university

Finance Department
166-220 Holloway Road
London N7 8DB
Switchboard 020 7423 0000

www.londonmet.ac.uk

17 May 2011

To Whom It May Concern,

Re: Indemnity Insurance for Student Research

I can confirm that Delaney Bucknor's student research is covered under the University's Professional Indemnity insurance (Policy No. RKK423027) held with AON Limited and Public Liability insurance (Policy No. NHE-01CA24-0013) held with Zurich Municipal.

The current policies we have expire on the 31st July 2011 but I can confirm that they will be renewed on the same terms on the 1st August 2011.

Yours sincerely

[signature]

Ediz Hussein
Finance Administrator

Direct line 020 7133 2011
Facsimile 020 7133 2590
Email e.hussein@londonmet.ac.uk

26th May 2011

To whom it may concern

RE: Referees scientific report for research ethics committee application for study titled: Changing illness and treatment perceptions in chronic spontaneous urticaria to improve quality of life outcomes: a pilot study and randomised controlled trial Intervention

This letter is written to confirm that the study being proposed for ethical review has been approved by the chief investigators academic supervisor Dr Anna Baker who is an expert in the field of health psychology and is the current course leader for the master and doctoral programs in health psychology at the School of Psychology, London Metropolitan University.

The study has also been approved by the academic institutions head of psychology, Dr Elizabeth Charman and the University Research Degrees Board who monitor PhD programs. The University Research Degrees Board acts independently of the chief investigators supervisory team and has deemed the study as a scientifically sound contributor to the overall PhD level of the project. A registration application form was recently completed in detail and forwarded to the committee and signed by the above named supervisor and second supervisor Dr Joanne Lusher. Ongoing reviews of the scientific quality of the study will be undertaken by the primary academic supervisor, second supervisor, other appropriate members of the psychology department as agreed by the academic supervisors and by the Research Degrees Committee Board.

If you have any problems or concerns regarding this statement or require further documented evidence, I can be contacted by telephone on 020-7320-2397, by email at a.baker@londonmet.ac.uk or in writing using the address below.

Thank you for your co-operation

Yours Faithfully

Anna N Baker

Dr Anna Baker
Principal Lecturer and PhD Academic Supervisor
School of Psychology
London Metropolitan University
City Campus
Calcutta House
Old castle Street
London
N1 7NT

Guy's and St Thomas' NHS
NHS Foundation Trust

[Address of participant and date]

Dear (Participants Name)

RE: Changing Illness and Treatment Perceptions in Chronic Urticaria: a Pilot Study and Randomised Controlled Trial Intervention

As an individual living with chronic 'spontaneous' urticaria (CU) you are being invited to take part in a research study investigating the effects of a newly developed chronic urticaria behaviour change intervention..

The purpose of the study is to determine if thinking about chronic urticaria differently and adopting new behaviours alongside prescribed medicines will help patients learn new information about CU and adopt new ways of thinking that will place them in a better position to make more informed choices regarding how they manage their symptoms.

You have been contacted as you where identified by your consultant dermatologist or urticaria clinic administration team as being an eligible candidate for this trial. This means that you are currently experiencing symptoms. The study is will not be exposing participants to any potentially invasive or harmful physical procedures. As the intervention is based on learning new information, thinking differently about chronic urticaria and adopting new behaviours the risks to your health, safely and wellbeing have been assessed to be minimal. The research will contribute to a doctoral research thesis, hence participation in the study is separate to your usual care so will not effect your current treatment and services, is confidential and entirely voluntary. The study is undertaken as a home visit and you would be involved for between 5 weeks to 4 months (i.e. once weekly for 3 weeks plus a follow-up at 3 months) depending upon how you are allocated to the study.

Please find attached a copy of the 'Research Participant Information Sheet' that will provide you with more details and hopefully answer any questions you may have. It is very important that you read this information carefully before deciding whether to participate.

If you were not given this letter in the clinic by the head researcher, you would have spoken to her previously by phone to establish your interest in participating. You can either accept or decline participation without any pressure. If you decide not to participate you can change your mind at a later date by contacting the head researcher within a month of this letter. .

If after reading the Research Participant Information Sheet' you still have any concerns, please do not hesitate to contact me by phone on 020-7423-0000 (ext 1204), by email on dbucknor@londonmet.ac.uk or in writing at the address below.

Thank you for your co-operation in reading this letter

Yours Sincerely

Miss Delaney Bucknor (BSc, MSc, MBPsS)
Head Researcher
Room 111 (1st Floor)
Faculty of Life Sciences
London Metropolitan University
Calcutta House
Old Castle Street
London E1 7NT

Version 1: 20th January 2011

LONDON metropolitan university

Guy's and St Thomas' NHS
NHS Foundation Trust

Research Participant Information Sheet

anging Illness and Treatment Perceptions in Chronic Urticaria: a Randomised Controlled Trial Intervention Study

rt 1

are asking you to take part in a new non-medicinal intervention study. Before you decide to take part it is portant for you to understand why the research is being done and what it will involve. Please take time to read the owing information carefully. If you are unsure or do not understand any aspect of what you are reading, please k for help.

art 1 will tell you about the study and its purpose.
art 2 will provide you with information about how the study will be carried out.

at is the purpose of the study?

s well known that Chronic Spontaneous Urticaria can have a profound impact on those who have the condition. It affect ones quality of life in terms of physical symptoms such as intense itching and painful swellings as well as turbed sleep, limitations in choice of social activities, work, relationships and ones emotional wellbeing. The chanisms of what causes chronic urticaria remain unknown in up to 70% of patients but new research is linking condition to auto-immunity and stressful life events. There is currently no cure but disease management currently es upon anti-histamines and other medications in order to control symptoms.

me patients find that chronic urticaria medicines do not always fully relieve symptoms and in some cases some ve reported them to be unhelpful, however two recent scientific research studies have found that even though this sometimes the case many chronic urticaria patients do not manage their treatment in ways that are favourable to lucing symptoms. Research has also found that this is not necessarily the fault of the patient but in their beliefs d understanding of the condition and how it should be treated. Research has also found that the beliefs in their n right can have an impact on the progression, maintenance and health outcomes of the disorder. For example, a rson who does not fully understand the disease or how their medicines actually control it my wait until itching or elling symptoms start or already in progression before taking their medicines. This is often too late as the edication was not inside the person's body at the time of the unknown trigger to prevent or reduce symptoms. ronic spontaneous urticaria patients have been found to be rather accepting of their condition and become very tive in seeking solutions to disease control. However these efforts sometimes result in disappointment if plans are t based on evidence based solutions.

e purpose of this study is to determine if learning more about your chronic urticaria and considering new coping haviours alongside taking your chronic urticaria medicines may change the way you think about it and place you in better position to make more informed choices about how you manage symptoms.

ny have I been chosen?

u have been chosen to take part because your consultant dermatologist (or a member of the urticaria clinics ministration staff) has identified you as a chronic urticaria patient who is eligible to participate (i.e. you are currently periencing symptoms). You are in a position to describe your personal beliefs and understanding of the condition,

how it affects you and to possibly benefit from new information and any potential new findings if the techniques show evidence of having a significant impact on personal and treatment control and the chronic urticaria experience.

Do I have to take part?

No, you do not have to take part. Your decision to participate is entirely your decision. If you decide to take part when contacted in the clinic you will be able to keep this information sheet and will be given a consent form, disease activity diary and questionnaire pack in the clinic on the day of your dermatology appointment to take home and read. If you were contacted by phone about taking part, the consent form, diary and questionnaire pack would have been sent to you by post with this information sheet. The consent form is not a contract and this means that if you decide not to take part during the process of the study, you may do so at any time. The study will be separate to your routine care at the clinic and for research purposes only. Participation is not compulsory and will not affect the standard of your current treatments or services. You will be given at least 24 hours to decide on whether to participate, however you will have four months prior to the end of the study (i.e. 31st January 2012) to decide whether to take part.

Who can take part in the study?

We are seeking to recruit 158 patients between 18 to 80 years of age with a primary medical diagnosis of chronic spontaneous urticaria. This means that you have experienced symptoms for least 6 weeks on a daily (or almost daily) basis and the causes of you condition are either not yet known or have been linked to how the immune system works. Participants will be currently experiencing the symptoms of itchy wheals and or swelling.

What will happen to me if I take part?

Half of the participants recruited to the study will take part in the trial's intervention study and half will be allocated into what is known as a control group. The control group does not undergo the trial intervention but are very imported as they allow the researcher to determine if the procedures of the trial intervention are more beneficial to chronic urticaria patients than no intervention at all. If you decide to take part you could be recruited to either the studies trial intervention or control group.

1. If you were approached about the study at the clinic you would have been given this information sheet, a consent form, a disease activity diary and a questionnaire pack for you to take home and read through. You will be contacted by phone 24 hours after this meeting to confirm if you would or would not like to take part. If you decide to take part an appointment time will be agreed between you and the researcher for an initial home visit and you will be informed about when to complete the questionnaires and start the diary. What will happen at this visit will depend on whether you are allocated to the intervention or control group (see below). The questionnaire and diary are described below:

Questionnaire pack: This will contain 6 different questionnaires that ask you questions such as you gender and duration of disease, your personal beliefs about chronic urticaria and its treatment, how you cope with the disorder, how the disorder makes your feel and how the condition impacts on your quality of life. The questionnaire is usually completed in approximately 15 minutes in a single sitting and is tick-box based.

Diary: This is a simple record sheet where you write the number of wheals that you can see over a particular area of the body (e.g. less than 20, more than 20) and the intensity of the itch over a four day period.(e.g. 0 to 3).

If you are recruited to the studies trial intervention a letter will be sent to your GP to inform them that you are taking part in an educational intervention to learn more about you skin disorder. If you do not want your GP to be informed of your participation you can request that you do not want them to be informed.

2. What happens to you will depend on what group you have been allocated to and these are described below. If you do not understand any aspects or have any questions, please contact the researcher using the details at the end of

s information sheet.

Trial Study Intervention Group

ur participation in the trial will take place as two home visits of approximately 45 minutes duration each plus a ow-up phone-call over 3 consecutive weeks. This means that the intervention will take place in your current place residence. If you are unhappy about this another agreed location can be arranged:

eek 1: Session (45 minutes):
e researcher will introduce herself and at this time she will ask for your completed questionnaire pack and diary. u will then be informally interviewed by the researcher to establish your current beliefs and views towards your ess in terms of the symptoms you experience, what you believed caused it, how long you believe it will last and its nsequences on your life. Once this is done you will have the opportunity to learn more about the condition and ar up any previous misconceptions based upon the information that you provided in the interview.

eek 2: Session (45 minutes):
in session 1 you will be informally interviewed by the researcher to establish your current beliefs and views vards your illness in terms of whether you believe that you have any personal control over CU and how you feel out CU medicines and other CU treatments. Once this is done you will have the opportunity to learn more about condition and clear up any previous misconceptions based upon the information that you provided in the erview. Additionally, you and the researcher will develop a simple action plan for you to do over the next 3 months help improve your symptoms.

OTE: Interviews in session one will be recorded to analyse important new information about chronic urticaria that sometimes quoted. They are also recorded to evaluate the quality of the researcher as an interviewer. *rticipants will have the right to refuse their interviews being recorded without this affecting their right to participate.* ease note that recorded interviews will be transcribed to written form before being destroyed and anonymised with ode number to protect the participants' identity.

eek 3: Phone-call (variable minutes):
u will be contacted by phone by the researcher to find out how you are finding the action plan and to answer any estions you may have. You will also be sent a second questionnaire pack and diary to complete plus a study aluation questionnaire. You need to complete the questionnaire pack and 7 day diary within a week of this final ssion and return in the business reply envelope provided with the evaluation form.

After 3 months you will be contacted by phone and informed that a final questionnaire pack, diary and evaluation estionnaire has been posted to you. You complete all before returning them in a postage paid envelope. When the al assessments have been received by the researcher you will be contacted by phone and given the opportunity to k any questions.

Control Group

ou are allocated to this group you will not go though the 3 trial sessions. You will be visited at your home on one casion for a single 30 minute appointment with the researcher. If you would like your appointment to reside outside ur home, an agreed location can be arranged. In this session the researcher will introduce herself and ask for your mpleted questionnaire pack and diary. The researcher will explain the importance of you being in the study and u will have the opportunity to ask questions. You will be informed that you will be sent a second questionnaire pack d 7 day diary to complete 3 weeks after the appointment and a third questionnaire pack, 4 day diary and

evaluation questionnaire 3 months after the second was sent. Both will be preceded by a phone-call from the researcher. You will complete each questionnaire and diary within a week of receiving them and return in the stamped envelope provided. When the final assessments have been received by the researcher you will be contacted by phone and given the opportunity to ask questions. Please note that being allocated to this group does not disadvantage you in any way as your usual medical care is deemed as the best current form of treatment.

What are the possible disadvantages and risks of taking part?

The study:
The study will not be exposing participants to any potentially invasive or harmful physical procedures. As the intervention is based on learning new information, thinking differently about chronic urticaria and learning new behaviours the risks to your health, safely and wellbeing have been assessed to be minimal. The interview and trial itself may also invoke negative emotions or realisations about just how much chronic urticaria has impacted on ones life. If this occurs you will have an opportunity to voice these concerns to the researcher but understand that the researcher is not a therapist and the relationship between both parties is terminated at the point where you have completed your participation. Participants will also have the opportunity to withdraw from the study at any time if they feel unable to continue, to contact their consultant dermatologist to discuss further actions, to contact their GP or to gain advice from the hospitals Patients Advice and Liaison Service (PALS). All will refer you to the appropriate health professionals or services. Please note that the study does not act as a treatment referral in itself.

Personal and research data:
It is acknowledged that you may be concerned about your personal information and research data becoming available to those who you believe should not have access to them. You may also be concerned about how participating will effect your current treatments and services. Participant's personal information will remain within their care team at the urticaria clinic at St Thomas Hospital. Once you sign the consent form you will be allocated a code number that is only identifiable to your personal and research data through the main researcher. This code will be applied to all questionnaires, diaries and other materials produced by the research participant during trial. This code will be used to allocate you to a trial group and to analyse your trial data. Interview recording will remain securely with the main researcher and transcribed to written format before being destroyed and coded.

You current treatment services:
This study is being taken as part of a Doctorate qualification and is separate to your usual care and services. Participating in the studies intervention or control group will not have an effect on your usual treatments and services. However you GP and dermatologist will be notified of your participation. The purpose of this is to acknowledge them that you have undergone an intervention designed to increase your understanding of the CU and adopt new way of facilitating how you manage CU. *During the trial it is important that you continue to take your prescribed medications.*

What are the possible benefits of taking part?
Taking part may allow you to learn new information about CU and adopt new ways of thinking that will place you in a better position to make more informed choices regarding how you manage and control your symptoms. You may also learn how to develop an ability to identify what strategies may or may not work for you, however if you are allocated to the control group there may be no direct benefit to you taking part.

What if there is a problem?
Any potential risk of harm from the research has been assessed to be minimal. If you have any complaints regarding the way you have been treated during the study, you can contact Miss Delaney Bucknor (Head Researcher) in the first instance on 020-7423-0000 (ext: 1204) or email d.bucknor@londonmet.ac.uk.

l my taking part in this study be kept confidential?
s. Further details regarding your personal information and study data can be found in part 2.

t 2

at if something goes wrong?
y potential risk of harm or injury from the trial has been assessed to be minimal. However if you feel that you have en harmed in anyway or would like to make a further complaint you will have access to London Metropolitan versities' complaint procedures. Please direct any complaints or concerns to Dr Anna Baker, Room CSG11, ndon Metropolitan University, Calcutta House, Old Castle Street, London E1 7NT. To get independent advice on ng part in NHS research you can contact the hospitals Patient Advice and Liaison Services (PALS) on 020 7188 01, by email on pals@gstt.nhs.uk or in person at PALS Manager's Office, 1st Floor, North Wing, St Thomas' spital, South Lambeth Road, London SE1 7EH

l my taking part in this study be kept confidential?
ou decide to take part in the study, only the main researcher (Ms Delaney Bucknor) and your usual care team will w of your participation. Please remember that your participation in this study is separate to your normal care so not interfere with your current treatments and services. Personal details such as your name, address and phone number will only be used to contact you regarding this study. These and your questionnaire data will be red securely at London Metropolitan University. Your details will not be discussed outside of the research team d your medical data will remain in the access and view of your usual dermatology care team. After signing the nsent form your research data and details will be assigned a code number. This code number will be used to cuss your data for data analysis purposes only.

at will happen to the results of the research study?
e results of this research will be written up as part of a doctoral research project. It is also hoped that the results be published in academic journals and presented at conferences. Data that you personally contributed to the ults will be combined numerically together with other patients' data for statistical and qualitative analysis to sent an overall pattern of findings therefore your identity will remain anonymous. A summary report of the studies in findings will be available to participants when they become available.

o is organising and funding the study?
e research is being organised and carried out by Ms Delaney Bucknor and London Metropolitan University. There o financial interest or gains to be made to those involved in the conduct of the research.

o has reviewed the study?
NHS research is reviewed by a group of independent people known as a Research Ethics Committee (REC). ey are responsible for assessing and protecting your safety, rights and wellbeing during the research process. This dy has been reviewed and approved by the NHS London REC and the hospitals 'Research and Development' m, your Consultant Dermatologist and academically by London Metropolitan University.

ntact for further information
ou are interested in taking part in the research, you will be given this information sheet to keep with a copy of your ned consent form. If you still have any questions about any aspects of the study not covered here you can contact Delaney Bucknor at London Metropolitan University by phone on 020-7423-0000 (Ext: 1204), by email at d. cknor@londonmet.ac.uk or in writing to Room 111, London Metropolitan University, Calcutta House, Old Castle eet, London E1 7NT. Ms Delaney Bucknor will be available to you while you are participating in the study.

Thank you for taking the time to read this information sheet that is yours to keep.

Guy's and St Thomas' NHS
NHS Foundation Trust

LONDON metropolitan university

Research Participant Consent Form

Changing Illness and Treatment Perceptions in Chronic Urticaria: A Pilot Study and Randomised Controlled Trial

1. I confirm that I have read and understood the patient information sheet dated (13/07/11, Version 1.1) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. ☐
2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my medical care or legal rights being affected. ☐
3. I know that my dermatologist and GP will be informed about my participation and I understand that my participation in the study is not related to my treatment and services ☐
4. I understand that relevant sections of my medical notes and data will be provided to the Chief Researcher where it is relevant to my taking part in this research (for study statistics only). I give permission for the Consultant Dermatologist to provide this additional information. ☐
5. I agree to my illness and treatment perceptions interview being recorded (I know that if I refuse by not ticking the box that I can still take part in the normal way as described to me) ☐
6. I agree to take part in the above study ☐

Name of participant	Date	Signature
Name of person taking consent	Date	Signature

If posting please return to: Ms Delaney Bucknor, London Metropolitan University, Calcutta House, Old Castle Street, London E1 7NT. The Chief Investigator can be contacted on Tel: 020-7423 0000 (Ext. 1204) or email d.bucknor@londonmet.ac.uk

To be completed by research staff only: Patient Code No: _____

LONDON
metropolitan
university

8th March2011

Dear Sir/ Madam

RE: Funding of research proposed for NHS Research Ethical Review

This letter is written to confirm that the research study named below has been reviewed and approved by the London Metropolitan University Research Degrees Committee as a part of the chief investigators research degree (MPhil/PhD).

'Changing illness and treatment perceptions in chronic spontaneous urticaria to improve quality of life outcomes: a pilot study and randomised controlled trial Intervention

Due to the approval of the study, London Metropolitan University will act as the main funder for this research to be conducted by the named Chief Investigator, Ms Delaney Bucknor (BSc, MSc, MBPsS).

If you have any queries regarding the nature of this funding, please do not hesitate to contact me by email at e.charman@londonmet.ac.uk, by telephone on 020-7320-1078 or write to me at the address above.

Yours Faithfully

Dr Elizabeth Charman
Head of School of Psychology

LONDON
metropolitan
university

8th March 2011

Dear Sir/ Madam

RE: Sponsorship of research proposed for NHS Research Ethical Review

This letter is written to confirm that the research study named below has been reviewed and approved by London Metropolitan Universities Research Degrees Committee as a part of the chief investigators research degree (MPhil/PhD).

'Changing illness and treatment perceptions in chronic spontaneous urticaria to improve quality of life outcomes: a pilot study and randomised controlled trial Intervention

Due to the approval of the study, London Metropolitan University will act as the main Sponsor for this research to be conducted by the named Chief Investigator, Ms Delaney Bucknor (BSc, MSc, MBPsS).

If you have any queries regarding the nature of this sponsorship, please do not hesitate to contact me by email at e.charman@londonmet.ac.uk, by telephone on 020-7320-1078 or write to me at the address above.

Yours Faithfully

Dr Elizabeth Charman
Head of School of Psychology

My Commonsense Chronic Urticaria Action Plan

My Goal:

e.g. I want to sleep better

How I will achieve my goal

Specific e.g. I will take my last daily dosage of CU medicines at 8pm in the evening with my evening meal to allow them to continue to work before I go to bed	
Measureable e.g. I will keep a diary next to my bed and write a short note of my ability to concentrate during the day and wakefulness I feel in the morning	
Attainable Yes I will keep my medicines on the dinner table as a visual reminder	
Realistic Yes I eat my dinner at home most days at this time	
Time bound I will try this for a month to see if this works	