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Title: Acupuncture's efficacy in the treatment of psychological and somatic distress: an exploration of potential mechanisms from an attachment research perspective

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[ACUPUNCTURE'S EFFICACY IN THE TREATMENT OF PSYCHOLOGICAL AND SOMATIC DISTRESS: AN EXPLORATION OF POTENTIAL MECHANISMS FROM AN ATTACHMENT RESEARCH PERSPECTIVE]

A thesis submitted to the University of Bedfordshire, in fulfilment of the requirements for the degree of Doctorate of Philosophy.

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AUTHOR'S DECLARATION

I, Ashley Bennett declare that this thesis and the work presented in it are my own and has been generated by me as the result of my own original research.

ACUPUNCTURE'S EFFICACY IN THE TREATMENT OF PSYCHOLOGICAL AND SOMATIC DISTRESS; AN EXPLORATION OF POTENTIAL MECHANISMS

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GLOSSARY

Absenteeism: Not being present at work.

Aetiology: The origin or cause of a disease or condition.

Analgesia: Pain relief medication

Antagonise: A compound that opposes the physiological effects of another.

Anterior cingulated cortex: Area of the brain which regulates blood pressure and heart rate. Psychologically it it is involved in decision making, emotional regulation and fault detection among others.

Autonomic Nervous System: The area of the nervous system responsible for processes which do not require conscious thought to operate, such as breathing and digestion.

Biomedicine: A medicine based on the sciences, especially Biology and Bio-Chemistry.

Causation: The direct impact of one variable on another.

Chronic Fatigue: A disorder which results in extreme fatigue lasting for more than 6 months, which does not improve upon sleep or rest and is often worsened by physical or mental activity.

Co-morbid: A medical condition that occurs simultaneously and is associated with another disease.

Dependant variable: Said to depend on the manipulation of the Independent Varilable.

Dichotomy: Only having two options.

Double Blind: When neither the participant or the researcher are aware which treatment is being administered.

Ecologically Valid: The ability for research study results to be able to be generalised for real life scenarios.

Efficacy: The capability to produce the desired result.

Empirical: Verifiable by experience or observations rather than theory or logic alone.

Endogenous: Internal cause.

Endorphins: A natural chemical that is released in the brain to reduce pain, in large enough amounts it can provide a state of relaxation or increase energy.

Enkephalins: Natural peptides that have potent analgesic (pain relieving) effects, they are released by neurons in the central nervous system.

Erroneous: Incorrect or false.

Exclusion Criteria: Reasons for not allowing a participant to take part in a piece of research.

Experiential avoidance: The avoidance of thoughts, feelings, memories, physical sensations, and other internalised experiences, despite doing so potentially creating harm in the long-run.

Extraneous variables: Vairables which impact the causal relationship between the IV and the DV.

Fibromyalgia: A chronic disorder which results in widespread pain, stiffness of muscles and connective tissues alongside sleeping problems, extreme fatigue and headaches.

Functional Syndromes: Medical conditions which disrupt normal bodily functions despite all physical investigations appearing within normal ranges.

Gastric Fistula: Abnormal opening in the intestinal tract.

Globus: The feeling of a lump in the throat.

Hypochondria: An abnormal chronic concern over ones' health, resulting in anxiety and often delusions over ones' physical condition.

Hypothesis: A reasoned and rational prediction as to the outcome of an experiment, grounded in theory and existing literature.

Independent Variable: The variable manipulated by the experimenter that is believed to impact the Dependent Variable.

Irritable Bowel Syndrome: A common disorder of the large intestine, which can cause fluctuations in bowel movements accompanied by pain, cramping and gas.

Meta-analysis: A study which attempts to draw broad conclusions by combining results of many individiual pieces of research.

Meta-physical: An empirical hypothesis that does not require emipiral testing, therefore unduly theoretical.

Minimisation Randomisation Technique: A randomisation technique which attempts to minimised differences in trial arms on pre-defined varilable. E.G. age & gender.

Multi-centre: A Multi-centre study uses more than one clinic for data collection.

Multivariate: More than one varilable.

Neuroendocrine: The interaction between the nervous and endocrine system, usually being of both structures in nature.

Neurological: Relating to the disorders or the anatomy, functions or the nerves and/or nervous system.

Non-ulcer Dyspepsia: Chronic upper abdominal pain or nausea, which is not connected to a peptic ulcer for explanation of origin.

Organic Disease: A disease caused by a clear physical or biological change to a tissue or organ structure within the body.

Oxytocin: A pituitary gland hormone, which regulates social interaction and sexual reproduction, it is often called the 'Love Hormone' as it is increased when engaged in positive physical interactions such as hugging. It is also the antidote to depressive feelings.

Palpating: To examine by touch for medical purposes.

Patented: Legally protected from recreation and resale without permission of the patent holder.

Percutaneous Endoscopic Gastrostomy: A tube that is inserted into the stomach, to allow liquid nutrients to be fed directly to a patient.

Periaqueductal: The main control center for pain modulation, it is the gray matter which surrounds the aqueduct of Sylvius and produces cells that supress pain.

Placebo: A treatment which is inert and that has no therapeutic effect.

Pragmatism: Dealing with things sensibly and realistically in a way that is based on practical decisions rather than theoretical.

Psychodynamic Therapy: A therapy which focuses on the unconscious processes of a persons' behaviour, in hope to make one self aware of the influence that past experiences can have on present behaviours.

Psychometrics: The psychological science of measuring mental capacity and activity.

Psychosomatic Medicine: Explores the social, psychological, and behavioral factors and what effects they have on bodily functions.

Qi: The circulating life force in Chinese Philosophy and Medicine.

Qualitative: Research that evaluates spoken or written words in order to establish opinion, motivation and underlying meaning.

Quantitative: A study which attempts to draw conclusions and inferences based on numerical values.

Quasi-experiments: Empirical studies used to estimate the causal impact of an intervention on the targetted population without random assignment.

Reattribution: To regard something as being caused by a specific source.

Scale: A psychological or medical questaionnaire that has been validated to measure a specific construct.

Serotonin: A neurotransmitter carrying signals along nerves, it is responsible for maintaining mood balance, enabling you to for example, feel happy, less hungry and more calm.

Sham: Bogus or Placebo

Single Blind: When only the participant is unaware of which treatment they are receiving.

Socio-emotional: The concept of the balance between feelings of distress, happiness and quality of relationships.

Somatic: That which related to the body, particularly that which is distinct from the mind.

Somatoform Disorder: A mental illness that causes physical symptoms, including pain.

Somatosensory: A sensation which can occur in a different area of the body than the original sensory organ, such as eyes or ears.

Sub-clinical: A disease which is not severe enough to result in formal diagnosis.

Type 1 Error: Incorrect rejection of the null hypothesis.

Type 2 Error: Incorrect acceptance of the null hypothesis.

Un-blinding: The process of revealing to the participant which treatment they received.

Univariate: One variable.

LIST OF ABBREVIATIONS

ACT: Acceptance and commitment therapy.
AIDS: Aquired Immune Deficiency Syndrome
ANOVA: Analysis of Variance
BMJ: British Medical Journal
BSI: Bradford Somatic Inventory
CAM: Complimentary and Alternative medicine.
CATS: Client Attachment to Therapist Scale
CBT: Cognitive Behavioral Therapy
CFS: Chronic Fatigue Syndome
COM: Conventional Medicine
CRF: Cancer Related Fatigue
CT: Computerised Tomography
DBT: Dialectical Behavioural Therapy
DV: Dependent Variable
EA: Experiential Avoidance
ERP: Event Related Potential
GHQ: General Health Questionnaire
GP: General Practioner
HIV: Human Immunodeficiency Virus
IBS: Irritable Bowel Syndrome
J-N: Johnson-Neyman
MANOVA: Multivariate Analysis Of Variance
MEAQ: Multidimensional Experiential Avoidance Questionnaire
MRI: Magnetic Resonance Imaging
MUS: Medically Unexaplined Symptoms
NHS: National Health Service
PEG: Percutaneous Endoscopic Gastronomy
PI : Principal Investigator
PSD: Park Sham-acupuncture Device
PTSD: Post-Traumatic Stress Disorder
RA: Research Assistant
RCT: Randomised Control Trial
RQ: Relationship Questionnaire
SD: Standard Deviation
SPSS: Statistical Package for the Social Sciences
TCA: Traditional Chinese Acupuncture
TCM: Traditional Chinese Medicine
UREC: University of Bedfordshire Research Ethics Committee

ABSTRACT

This thesis examines the effectiveness of acupuncture therapy in the treatment of psychological and somatic distress in the context of medically unexplained symptoms (MUS). Also, it explores the role of psychological attachment and experiential avoidance in an effort to explain potential mechanisms of acupuncture's effect. Existing literature demonstrates some level of effectiveness of acupuncture therapy for the treatment of depression, anxiety and somatic symptoms. However, a lack of experimental rigor in methodology means that existing results cannot be shown to be superior to a placebo and thus current treatment protocols for patients with MUS do not include a recommendation of acupuncture therapy. MUS are defined as any set of symptoms that cannot be explained by organic disease, these clusters of symptoms are theorised to be of psychological aetiology. Sufferers of MUS find themselves stuck in a perpetual loop of secondary care referrals with little or no treatment options being made available. Whilst there is some evidence that talking therapies, such as cognitive behavioural therapy, are effective, their availability, efficacy and stigma mean they are often not desired by patients who suffer with MUS. Previous research has shown that insecure attachment predicts higher instances of, psychological and somatic distress, as well as MUS. Previous work undertaken by the author of this thesis also suggests that there may be a moderating effect of attachment in acupuncture therapy outcomes. In order to investigate acupuncture's efficacy a double-blind randomised control trial was undertaken; 63 participants were randomised to receive either five treatments of genuine acupuncture or a non-penetrating sham form of acupuncture using the Park sham acupuncture device. A rigorous procedure ensured participant and practitioner blinding to group allocation. Primary measures of psychological (GHQ) and somatic (BSI) distress were taken at pre, post and follow-up time points (8 weeks). Secondary measures included general attachment (RQ), experiential avoidance (MEAQ) and client attachment to therapist (CATS). Results showed a significant effect of acupuncture over placebo in the reduction of both psychological (GHQ) and somatic distress (BSI). This therapeutic effect was maintained

at 8-week follow-up. Further results showed moderation effects of secure attachment on somatic symptoms in the treatment group but not placebo group. Experiential avoidance also moderated somatic symptom outcomes in the treatment but not placebo group. A subsequent study utilising a quasi-experimental multi-centre methodology, which used identical measures to the previous experiment, revealed the same significant reduction of both psychological and somatic distress. This study consisted of 184 participants across five clinics, each participant receiving five sessions of acupuncture. Similar results were observed regarding moderation effects of secure attachment on treatment outcomes of somatic symptoms. Results also showed differences in moderation effects between participant with a MUS diagnosis vs. those without. Findings of both studies suggest acupuncture is an effective treatment for psychological and somatic distress, as well as MUS. The differences in attachment moderation effects between treatment and placebo may indicate acupuncture's ability to elicit endogenous opioid release in the brain. However, further neurological studies are required to confirm this hypothesis.

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CHAPTER 1 – INTRODUCTION

1.0 PERSONAL HISTORICAL ACCOUNT

My interest in studying this topic area first began when I began studying Traditional Chinese Medicine (TCM) in London, whilst also studying psychology at University. I was being concurrently taught from two different stand points. On the one hand, in psychology, I was being taught about the western scientific method, how clinical trials tested against placebos are our best source of evidence for interventions, and that psychology was, at it's very core, a science. Conversely, during my acupuncture training, it was being explained to me that there was an invisible life-force (Qi) that flows through everyone in channels in the body known as meridians, and that the insertion of fine needles at specific anatomical points along these points would help to re-regulate the flow Qi and thus help relieve certain symptoms. It was clear during my acupuncture training that much of the information about the system of medicine, whilst complete, comprehensive, and, anecdotally, very effective in treating certain ailments. However, it was not evidenced in the same way as the psychological treatments I was learning about in my psychology training, and research was seldom mentioned during the TCM training. This challenged my own learning as I was studying both traditions of knowledge simultaneously, it quickly led to me wanting the challenge of colliding these two worlds in an attempt to find common ground whereby this traditional system of medicine could be explored using what I was learning to be the best ways of approaching scientific enquiry.

During my study of psychology, I become incredibly interested in the power of the mind and the idea that the mind could manifest physical symptoms, this was also an ideology that was reflected in TCM, in that psychological dysfunction/distress could cause the manifestation of physical symptoms. In psychology these symptoms are known as somatic symptoms and form the foundation of medically unexplained symptoms (MUS). By the end of my second year of study of both psychology and TCM, it was clear to me that I wanted to investigate if acupuncture was a suitable treatment for MUS. Having completed my undergraduate dissertation investigating this in a single clinic, I decided to apply for a Ph.D. which would go

further and subject TCM to the gold standard of scientific methodologies to determine causation of acupunctures ability to treat MUS.

The remainder of this chapter will present an overview of the core topic areas whilst attempting to review all available literature for the combination of topics that address the research aims and hypotheses. Sections, 1.1, 1.2, 1.3, & 1.4 are focused on defining the key concepts and introducing the key theories along with core empirical evidence of their existence. Whilst sections 1.3.1, 1.4.1, 1.4.2, & 1.4.3 shows literature search strategies, and discusses the literature found in these areas in order to highlight the need for further investigation.

1.1 SOMATIC DISTRESS AND MEDICALLY UNEXPLAINED SYMPTOMS

In recent years the link between depression, anxiety and somatic symptoms has been empirically strengthened (Creed et al., 2010; Price, 2012; Sharpe, 2002). Early philosophy posited that the mind and body were two separate entities and as such could not impact one another, thus is was believed that thoughts could not impact the physical world. This was first proposed by René Descartes (1596 – 1614) who held the opinion that the mind was meta-physical. It was several hundred years later that the link between mind and body would begin to be examined by science. Engel and Reichsman (1956) reported a case study involving a patient, who was a young, 15-month old girl, named Monica, suffering with a gastric fistula which meant she required feeding through a percutaneous endoscopic gastrostomy (PEG) tube. This method of feeding meant that gastric secretions could be easily measured. Upon noticing an increase in gastric secretions when the child appeared happier, Engel and Reichsman began an experiment whereby Reichsman would behave as a friendly doctor and Engel would take the role of a sombre stranger. In the presence of Engel, Monica became more depressive in mood and gastric secretions decreased which would subsequently lead to reduced performance of Monica's digestive system (somatic symptom). However, upon return of Reichsman the secretions would return to normal and Monica's mood would lift, this was early evidence of the link between psychological distress and autonomic nervous system function. In modern day medicine, somatic symptoms which accompany even mild forms of depression or anxiety are rarely diagnosed, but often cause a great deal of distress (both physical and psychological) to the patient. If a set of physical symptoms cannot be explained by any form of organic disease or pathogen it is said to be a medically unexplained symptom (MUS). MUS are any single or set of symptoms that are not explained by organic disease (Creed et al., 2010; Price, 2012; Sharpe, 2002) despite multiple visits to specialists for diagnostic testing. Although there is no evidence of a directional causal link, symptoms experienced by patients with MUS are said to be physical manifestations of psychological disorders such as depression and/or anxiety as these

conditions are often co-morbid with MUS (Brown, 2004); with comorbidity rates reaching as high as 60% (Burton, McGorm, Weller, & Sharpe, 2011; Henningsen, Zipfel, & Herzog, 2007). In addition to this definition many commonly diagnosed ailments are also considered medically unexplained, such as irritable bowel syndrome (IBS), fibromyalgia, chronic fatigue, non-ulcer dyspepsia etc. (Henningsen & Creed, 2009; Kroenke, 2007; Sharpe, 2002). These diagnoses are often referred to as functional syndromes. They differ from physical symptoms expressed by patients who are diagnosed with clinical anxiety and depression in that they are not accompanied by the possibility of such a diagnosis. That is, no other psychological explanation has been determined to cause the symptoms, in addition to a lack of organic disease. Research has shown that individuals suffering with one or more of these functional syndromes is likely to have increased levels of depression and anxiety when compared to those who have a condition of known organic origin (Henningsen, Zimmermann, & Sattel, 2003). However, the depression and anxiety levels of those diagnosed with MUS remain sub-clinical, such that the psychological disorders are not the primary diagnosis given. These so called 'blanket diagnoses' of MUS have occurred because there are many individuals that present with similar patterns or clusters of symptoms; however, no organic cause can be established. The aetiology of MUS is largely unknown however, it is likely to involve a multitude of factors such as predisposing (previous illness or injury), precipitating (current illness, psychiatric disorders or stressful/traumatic events) or perpetuating (Cognitive factors, reaction to others or financial gain)(Sharpe & Carson, 2001).

Individuals that suffer from MUS make up around 1% of the general population; in primary care this percentage increases to 15-19% (Henningsen & Creed, 2009; Peveler, Kilkenny, & Kinmonth, 1997). However, of those in secondary and tertiary care, 25-40% are believed to be suffering with MUS (Barsky, Orav, & Bates, 2005; Brown, 2004; Henningsen & Creed, 2009). It has become commonplace in primary care for general practitioners to air on the side of caution and refer MUS patients for secondary care diagnostic testing, such as X-rays, MRI scans, blood tests, etc. Patients often present with clusters of symptoms that may be

indicative of a more sinister underlying cause that, coupled with the obvious anxiety from the patient, result in regular secondary care referrals (Brown, 2004). Repeated referrals of MUS patients to secondary care by General Practitioners (GP) has two main negative effects; the first being the distress that the patient feels both from repeated visits to hospital and not being given a concrete diagnosis or effective treatment (Katon et al., 1990; Reid, Wessely, Crayford, & Hotopf, 2002), the second is the increased cost to the National Health Service (NHS). Patients suffering with MUS cost the NHS an estimated £3.1 billion each year (Barsky et al., 2005; Bermingham, Cohen, Hague, & Parsonage, 2010; Burton, McGorm, Richardson, Weller, & Sharpe, 2012), this is a result of the multiple referrals for diagnostic testing (e.g., blood tests, repeated MRIs, Computerised Tomography (CT) scans, etc.) (Brown, 2004; Sharpe, 2002) but does not include the additional GP appointments, prescription costs, public and private sector absenteeism, or costs of social income support, which are likely to increase this figure(Cooper & Dewe, 2008). Currently patients with MUS are rarely treated in the NHS using any specialist services (Henningsen & Creed, 2009), instead patients are often referred to secondary care depending on the nature and severity of the symptoms (e.g. chest pain – cardiology) if the primary care practitioner (GP) does not believe the symptom/s requires a referral often basic analgesia will be prescribed (Creed, Henningsen, & Fink, 2011).

1.1.1 OPERATIONAL DEFINITION OF MUS

For the purposes of this thesis, it is important to define an operational definition of MUS which will be used both when discussing MUS but also when classifying participants as suffering with MUS in the studies. Any participant who reports suffering with one or more of the following list of diagnoses will be considered to have MUS.

- Irritable bowel syndrome
- Pelvic pain
- A psychiatric diagnosis
- Fibromyalgia
- Fibrositis
- Low back pain

- Chronic back pain
- Tension headache
- Chronic headaches
- Atypical facial pain
- Chronic fatigue (ME)
- Palpitations

- Post-viral fatigue syndrome
- Non-cardiac chest pain
- Non-ulcer dyspepsia
- Dizziness
- Insomnia
- Mitral Valve Prolapse
- Multiple Chemical Sensitivity
- Globus

- Sick Building Syndrome
- Repetitive Strain Injury
- Chronic Whiplash
- Hyperventilation Syndrome
- Pre-menstrual Syndrome
- Vocal Cord Dysfunction
- Temporomandibular Joint Disorder

This list of syndromes is taken from the publications of Sharpe (2002), Henningsen and Creed (2009); Henningsen et al. (2007) and Kroenke (2007). It is not believed that this list is exhaustive and there may have been participants in the trial that could have been diagnosed as MUS, that were not recorded as such. However, given the lack of feasibility in utilising a medical doctors time to individually assess each participant in both studies, the decision to use this self-report approach was routed in the literature and pragmatism. In addition, it is important to note that, provided participants self-report truthfully, if they are able to tick one or more of the list of diagnoses they would be considered as suffering with MUS under the DSM-V definition (Isaac & Paauw, 2014; Morrison, 2014; Nimnuan, Hotopf, & Wessely, 2001).

1.1.2 CURRENT INTERVENTIONS

Despite a range of psychological therapies being available to patients suffering with MUS (depending on local provision), many either do not wish to attend or if they do, do not see sufficient improvement or satisfaction (Brown, 2006; Fritzsche et al., 2011; Michlig, Ausfeld-Hafter, & Busato, 2008). In addition to this, primary care general practitioners and nurses are tasked with attempting to understand if what the patient is experiencing is of organic origin or not. If correctly identified as MUS, the practitioner then has the issue of attempting to convince the patient that a referral to a psychological intervention may be the best option for their condition (e.g. IBS, fibromyalgia, chronic fatigue syndrome etc.). Whilst some may oblige, there is evidence to suggest that those faced with a psychological intervention will be dissatisfied and are unlikely to engage compared to an alternative therapy option (Fritzsche

et al., 2011; Michlig et al., 2008). Despite this there is evidence to support a talking therapy approach for MUS.

1.1.2.1 CBT FOR MUS

Cognitive behavioural therapy (CBT) has been proposed as an intervention for MUS and typically consists of identifying erroneous thought processes that may have led to the physical symptom manifesting. By addressing these faulty thoughts, CBT aims to rectify the core issues within the patient to prevent somatisation. Research has shown that CBT significantly improves MUS when compared to usual care protocols. A randomised trial consisting of 147 participants showed that CBT significantly improved physical functioning, bodily pain and vitality (Schroder et al., 2012). Whilst this is a positive result, the measures that were used did not include a specific somatic symptom questionnaire, failure to capture improvement on a specific somatic measure, could reduce the usefulness of results as improvement across other dimensions, including those which may be medically explained, could be captured. A systematic review by Price (2009) investigating the effectiveness of CBT for those suffering with chronic fatigue syndrome (a function syndrome which is considered medically unexplained), showed strong evidence for its efficacy significantly outperforming usual care across fifteen studies. Zijdenbos (2008) conducted a review of 25 studies that investigated various psychological therapies for the treatment of IBS, the review concluded that psychological therapies provided greater results than usual care, CBT was included and had the largest effect compared to interpersonal psychotherapy and relaxation and stress therapy. In a further review of 34 Randomised Control Trials (RCT) CBT was found to be an effective treatment for MUS and somatoform disorders (Kroenke, 2007). Whilst the evidence seems compelling, all three reviews state that follow-up data is inconsistent and it is not clear if patients are having any long-term benefit from CBT therapy. In addition, CBT appears to only address one third of the theorised causes of MUS. According to Sharpe and Carson (2001) the three factors that contribute to a person

presenting with MUS are, predisposing, precipitating and perpetuating, CBT as a therapy, by definition, can only deal with the perpetuating factors of MUS as the aim is to address faulty thinking processes. This may not, in turn, impact on predisposing factors such as a person's early childhood experiences (see. 1.2.1), or rid them of any existing disease or injury. This may be why the follow-up data for studies is inconsistent between the big trials; whilst initial efficacy may be good, long-term sustenance of the effect may be hindered by predisposing and precipitating factors. However, earlier models of medically unexplained symptoms highlight why it may have been thought that CBT would be a good intervention. Barsky and Wyshak (1990) first defined the somatosensory amplification model in relation to those who suffer with hypochondriasis. However, it was later applied to those with MUS in an attempt to explain how and why patients may be suffering. This model takes the form of a perpetual circle consisting of five points; perception, attribution, physical complaints, attention focussing and increased intensity. This perspective lends itself to the notion that CBT may be able to address the misattribution of perceptions in an attempt to reduce the presence of the unexplained symptom/s (see. 1.1.1.3).

CBT therapy for the treatment of MUS appears to be effective, at least in the short term and is currently the intervention with the most compelling evidence for its use (Kroenke, 2007). Sharpe (2002) suggests there is a risk that patients with MUS may not wish to be treated as mental health patients. They may struggle to make the link between what they feel are physical symptoms and what may be of somatic origin. Whilst the process of attending a talking therapy, such as CBT, may address this issue, initial uptake, ultimate satisfaction and longevity of effect may render this approach sub-standard (Fritzsche et al., 2011; Michlig et al., 2008). This point is reinforced by Brown (2004), who states that patients should not feel blamed by their GP for their symptoms and by stating that the problem is "all in your head" or that "there is nothing wrong with you", one may be exacerbating their symptoms by triggering a psychological defence mechanism. Thus, the referral from primary to secondary care for CBT raises cause for concern. If one should be cautious about suggesting that the physical

symptoms that the patient is experiencing are, in fact, of psychological origin. Then a referral to a psychologist for CBT therapy would surely be something that would be discouraged rather than encouraged? Indeed, evidence suggests that satisfaction with conventional interventions such as CBT for MUS is much less than other approaches (Fritzsche et al., 2011; Michlig et al., 2008).

1.1.2.2 PSYCHDYNAMIC THERAPY FOR MUS

Another treatment that has been proposed for MUS is psychodynamic therapy. Psychodynamic therapy attempts to treat patients by liberating their self-awareness by looking at past events and behaviours and understanding how they may be impacting current behaviour. This enables the patient to resolve conflicts and symptoms that have arisen as a result of a dysfunctional relationship or past event. This form of treatment would almost exclusively focus on the predisposing issues that may have caused the symptom/s and attempts address these issues to improve the symptom/s. In a randomised control trial, psychodynamic therapy or enhanced medical care was given to 211 patients with MUS. Results showed that those who received psychodynamic therapy showed significant improvement on their quality of life and somatisation. However, there was no improvement in depression, health anxiety or healthcare utilisation, which could indicate that the effects observed may be short lived (Sattel et al., 2012). Much like CBT there are fundamental issues with proposing that an individual with physical symptoms attend a talking therapy, despite potential for improvement, patients may not be able to make the link between their past experiences and their present somatic symptoms.

1.1.2.3 REATTRIBUTION FOR MUS

Many models that attempt to explain why people suffer with MUS include a misattribution component (Rief & Broadbent, 2007). This component suggests that individuals that are susceptible to MUS may misattribute a physical sensation and perceive it as a more

concerning health issues than it really is. Researchers have coupled this with the potential reluctance for patients with MUS to attend talking therapies in order to develop training for general practitioners (GP) to treat MUS patients using a reattribution approach. This approach provides the GP with a set of steps in order to best deal with a MUS patient. They involve ensuring the patient feels understood, which may consist of taking a detailed medical history of the symptoms, exploring emotional, social and family cues to symptoms, discussing the health beliefs of the patient and a physical exam (if indicated). Secondly GPs should broaden the agenda, this would involve feeding back the results of the examination, acknowledgement of the reality of the symptoms and linking the physical, psychological and life events to the symptoms. Third, the GP should make the link, this should come in the form of an explanation of how psychological issues such as depression and anxiety may cause physical symptoms and this should be demonstrated with practical examples. Lastly the GP should arrange a follow-up appointment in order to monitor progress. This consultation should take the form of a negotiation between patient and practitioner for the best results. One such study trained 34 GPs in the reattribution approach and had them implement it on a random selection of 141 participants who presented with medically unexplained symptoms. Patients were cluster randomised and either received treatment from a practitioner who was trained in reattribution or was not. Results showed that those who were in the reattribution group were more likely to subsequently attribute their unexplained symptom/s to a psychological cause which according to many models of MUS could result in an improvement in symptoms. However, this study did not collect any primary outcomes of symptom reduction or quality of life improvement from patients (Morriss et al., 2007).

In a study that looked at GPs attitudes towards reattribution for patients with medically unexplained symptoms (Dowrick et al., 2008), seventy four GPs were interviewed and completed a structured survey. Findings showed that practitioners often found it difficult and stressful working with patients with MUS. However, those who had been provided

reattribution training felt more confident in their ability to help this group of patients. Many barriers to the use of reattribution were highlighted in the findings of this study, such as issues surrounding the patient having entrenched views that their symptoms are organic in origin, the consultation of patients with many GPs in one practice and patients not just presenting with MUS therefore making it difficult to form a concrete diagnosis. This qualitative study helps to understand why some GPs may not be well equipped to implement such a technique in their practice, GPs are often working in multidisciplinary teams, with consultation time restrictions and patients that may not be happy to accept a non-organic explanation. In addition, it helps to understand how this approach may not be entirely appropriate for all sufferers of MUS, particularly those who are convinced that their issue is of organic origin. Whilst these results help to uncover some of the potential barriers GPs face in the use of reattribution, the qualitative nature of this study means that findings cannot be generalised, nor do they provide meaningful patient outcomes to support reattribution's efficacy.

1.1.2.4 COMPLEMENTARY AND ALTERNATIVE MEDICINE

Burton et al. (2012) identify that there is a need to develop and evaluate more cost effective and therapeutically intense methods of treating patients with MUS. Those who find conventional treatments either ineffective or unsuitable may choose to turn to a complementary or alternative medicine (CAM). Research indicates that between 35% and 63% of patients with chronic pain use one or more CAM therapies (Lee & Raja, 2011), figures from other studies give figures for specific functional syndromes. As many as 41% of IBS sufferers utilise CAM (Taneja et al., 2004), 90% of fibromyalgia patients (Holdcraft, Assefi, & Buchwald, 2003) and 19-35% of chronic fatigue sufferers (Bombardier & Buchwald, 1996). In addition to these figures, studies have shown that satisfaction and clinical improvement are also are higher amongst sufferers of MUS in CAM treatments when compared to talking therapies (Fritzsche et al., 2011; Michlig et al., 2008). Whilst there are many complementary and alternative medicines available to the general public, acupuncture

is one of the most prevalent the world over (WHO, 2013). As the focus of this thesis it is introduced at length in 1.4.

1.2 ATTACHMENT

Attachment is an important interpersonal psychological framework which is believed to be imperative in human life due to its evolutionary and adaptive implications. First posited by Bowlby (1973, 1982), he suggested that human beings are predisposed to form close attachments with trusted others, for instance primary care givers in the case of infants. These trusted others, which are sometimes referred to as attachment figures or objects, are expected to provide support in times of need and, engagement and encouragement in times of calm. Attachment security, a term first coined by Bowlby, that also became a cornerstone of attachment theory, is the expectation of an individual that attachment figures will respond appropriately in times of calm and need. This extends to the individual themselves also being able to manage difficult times and evoke appropriate responses from other when required. According to Bowlby (1973, 1982), dependent on their childhood experiences with close relationships, focussing primarily on their primary care giver, individuals have different levels of attachment security. These early experiences are stored in the form of mental representations or working models of attachment and they impact cognitive, emotional and behavioural processes (Bretherton & Munholland, 2008; Collins & Read, 1994). These working models are believed to operate at a non-conscious level, and therefore are largely unobvious to the individual. Despite many varying opinions on the way in which to categorise attachment behaviour, many researchers agree that attachment can be classified along two central continuums, anxiety and avoidance, which in turn provide four attachment styles (Bartholomew & Horowitz, 1991; Fraley, Waller, & Brennan, 2000).

These two continuums can be used to define the four attachment styles, when one is low in anxiety and avoidance they are said to have a secure attachment style. This style is characterised by an ability to manage stress effectively and establish and maintain mutually

supportive relationships with others. This secure style is considered the most beneficial attachment base and allows for the best development. Contrary to this secure style are three insecure attachment styles, the dismissive (sometimes referred to as avoidant) style is characterised by high levels of avoidance and low anxiety and manifests as the individual being highly independent and avoidant of any emotional engagement. The preoccupied or anxious (sometimes referred to as ambivalent) style is the opposite of the dismissive style in that individuals are high in anxiety and low in avoidance, this results in individuals that are very quick to form close emotional ties and overdependence to others, and have a limited ability to independently cope. Finally, the fearful (sometimes referred to as disorganised) attachment style is characterised by high levels of both anxiety and avoidance, this results in considerable discourse in creating, maintaining and terminating personal attachments, this conflict manifests as aggression towards others and sometimes the self. These four styles are believed to develop as a result of the attachment that forms during early childhood with the primary care giver, if the child experiences a consistent, supportive parent they are likely to form secure attachments. If the parent is not responsive to the child's needs, the child may develop a dismissing attachment style, if the parent is inconsistent then this may elicit a more anxious style in the child. Lastly if experiences with the caregiver were perceived as traumatic, disturbing and/or frightening, then it is likely that a fearful attachment style will ensue. Research has shown evidence that a child or adult with an insecure attachment style (any of the three) are likely to have compromised socio-emotional functioning which may result in dysfunction in relationships and coping, interpersonal conflict, higher rates of poor mental and physical health (Cassidy & Shaver, 1999).

1.2.1 ATTACHMENT AND PHYSICAL DISTRESS

Research provides evidence of the link between the attachment system and perceptions of physical distress (namely pain). Evidence from one study by Master et al. (2009) showed that participants were able to endure a higher level of pain stimulation when viewing a picture of their long term partner. The study consisted of twenty-five female participants who

were in long term relationships, this was defined as being in a relationship for longer than six months. Participants were then subjected to thermal stimulations in order to evoke a moderate pain response. During the thermal stimulations participants completed seven conditions, one control condition and six conditions that involved either their partner (holding their hand or viewing their picture) a stranger or an object. Results showed that tolerance to pain was significantly reduced in conditions that involved their long-term partner. Further evidence also suggests that differences in attachment style are related to the experiences and management of physical distress. Those with a low attachment anxiety have been shown to have higher pain thresholds than those who score high on the same continuum, in addition to this, low attachment anxiety is also associated with greater control of and over pain. This evidence comes from a study by Meredith, Strong, and Feeney (2006b) who took fifty eight participants and subjected them to a cold pressor task, those with greater attachment anxiety showed significantly lower pain thresholds, greater levels of stress, depression and catastrophizing[1]. These findings are corroborated with animal research which shows that rats which were deprived of their mothers from birth show greater emotional responses to pain than those who were not maternally deprived (Uhelski & Fuchs, 2010).

The research by Master et al. (2009), Meredith et al. (2006b) and Uhelski and Fuchs (2010) go some way to understanding how those with secure or insecure attachment styles perceive pain and physical distress. However, they do not involve the exploration of biological mechanisms that might complete the picture of how these relationships and associations exist. MacDonald and Leary (2005) suggest that social pain, such as being rejected socially, results in a similar neuroendocrine and neurological response to that of physical pain. These responses typically involve the activation of oxytocin and opioid systems and the periaqueductal gray and anterior cingulated cortex. Of particular interest is the opioid system, when animals or an individual experiences pain this system activates to

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[1] Catastrophizing is the irrational thought that something is going to be or is far worse than is actually is or will be.

release endogenous opiates such as beta-endorphin, met- and leu-enkephalins and dynorphins, which provide an analgesic effect in order to protect the organism from pain (Holden, Jeong, & Forrest, 2005). In line with the above mentioned research, this same endogenous opioid system is also activated when in the presence of a significant other (e.g. a husband or wife) creating a feeling of happiness, which serves to reinforce the participation in the relationship (Machin & Dunbar, 2011).

Research also evidences a link between attachment style and the presence of somatic symptoms. Taylor, Mann, White, and Goldberg (2000) took 2042 primary care patients and administered a set of measures including; the general health questionnaire (GHQ) which measures psychological distress, the brief symptoms inventory for somatic distress and the self-reported adult attachment style. Their general practitioners rated participants' conditions in to one of three categories, either; explained physical, unexplained physical or psychological. Findings showed that there was a strong relationship between the type of presentation and the patient's attachment styles, those with an insecure attachment style were twice as likely to present with a psychiatric or physically unexplained complaint. Those with a purely psychological complaint were three times more likely to have an insecure attachment style when compared to those with complaints of an organic cause. In a follow up study Taylor, Marshall, Mann, and Goldberg (2012) contacted 410 patients who had recently presented at a primary care clinic with an unexplained physical symptom/s. Much like their earlier study an association was found between insecure attachment style and frequent attendance of those with MUS. The idea that insecure attachment styles are more closely related to somatic complaints with no organic origin is supported by Ciechanowski, Walker, Katon, and Russo (2002) who showed, in their study involving 701 female primary care patients, that anxious or fearful attachment style presentations were associated with higher levels of unexplained symptoms. In addition to this, insecure attachment styles have been associated with increased pain intensity and decreased quality of life in individuals suffering from arthritis (McWilliams, Cox, & Enns, 2000), migraines (Rossi et al., 2005) and

other chronic pain conditions (Meredith, Ownsworth, & Strong, 2008; Mikail, Henderson, & Tasca, 1994). Waldinger, Schulz, Barsky, and Ahern (2006) also provide evidence, from their study of 109 American couples, that there is an association between those who have an insecure attachment style and somatic symptoms, in both men and women.

Research has primarily focused on adults, with regard to the manifestation of somatic symptoms and their subsequent associations with attachment style. However, research also supports the underlying notion that attachment theory proposes, that early childhood experiences are closely linked to the formation of typical and atypical attachment strategies. Waldinger et al. (2006) show significant associations between childhood trauma and insecure adult attachment styles. This is further supported as research shows that individuals who somatise are more likely to be raised by substandard caregivers in dysfunctional family units where there is considerable conflict and even physical and sexual abuse (Stuart & Noyes Jr, 1999; Terre & Ghiselli, 1997). These findings appear to support attachment theory's primary ideology that the attachment system is a central component in the bio-psycho-social regulation of the human organism. Whilst attachment theory would suggest that appropriate caregiver response is essential in the formation of a secure attachment base, resulting in a child who is able to appropriately respond to psychological and physical discomfort and pain; Zeifman and Hazan (1997) would posit that these early interactions are conditioning the endogenous opioid system directly, in order to ensure activation during times of interpersonal bonding and pain regulation in the future.

1.3 EXPERIENTIAL AVOIDANCE

Experiential avoidance (EA) is the tendency for individuals to avoid engagement with negative or painful thoughts, feelings, memories, physical sensations or any other internal experience (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). Those who have high levels of experiential avoidance will actively attempt to reduce activities that may trigger an unwanted thought or experience, this negative reinforcement of negative thoughts is thought

to be the mechanism that maintains high levels in an individual. Hayes et al. (1996) suggests that it is not the negative thoughts or sensations that are the issue in those with high EA but instead their avoidant coping mechanism which is related to poor psychological wellbeing. Many psychological therapies aim to address this issue by encouraging acceptance during treatment, this takes a number of different forms depending on the theoretical approach. For example, behavioural approaches might exploit exposure of negative thoughts or experiences in an attempt to habituate the client. In psychodynamic theory experiential avoidance is considered a form of defence mechanism which can lead to various types of psychopathology, a therapist would attempt to remove these defence mechanisms over time to restore wellbeing. EA itself wasn't specifically targeted until the advent of CBT, most noteworthy with regards to EA is acceptance and commitment therapy (ACT)(Plumb, Stewart, Dahl, & Lundgren, 2009). One of ACT's core principals is to teach clients the ability to accept thoughts, this directly addresses those who have a high tendency towards avoidance. One may argue that the concept of experiential avoidance is somewhat paradoxical in that by actively trying to avoid thoughts or sensation you are, in fact, engaging with them even more. The evidence would also support this notion, that conscious thought suppression is not possible without increasing engagement with said thought (Wegner, Schneider, Carter, & White, 1987), this may indicate that avoidant behaviour is a non-conscious process.

1.3.1 EXPERIENTIAL AVOIDANCE AND SOMATIC DISTRESS

There have been a limited number of studies that have made links between high levels of somatic distress and the tendency for people to be high in EA. A literature search of the MEDLINE and CINAHL databases was conducted on 03/06/2016 using the title keywords "experiential avoidance" and "somatic distress". It revealed one paper by Morina, Ford, Risch, Morina, and Stangier (2010). No additional results were found when the second keyword was changed to any of the following; "somatic symptoms", "somatoform disorder", "medically unexplained symptoms". The one study found investigated 163 Kosovo civil war

survivors who, on average, reported more than ten exposures to traumatic events during the war. It was found that those with posttraumatic stress disorder (PTSD) also showed high levels of somatic distress and that EA mediated this relationship, with higher levels of EA relating to higher levels of both PTSD and somatic distress (Morina et al., 2010).

Experiential avoidance is another construct that may lend itself to furthering the understanding of MUS sufferers and their response to acupuncture treatment. Experiential avoidance appears to have a relationship with levels of depression, anxiety and MUS, suggesting that those who avoid psychological distress are likely to have higher instances of MUS (Morina et al., 2010). Tull, Gratz, Salters, and Roemer (2004) conducted a study with 924 participants which, although EA showed no association with posttraumatic distress, it did with depression, anxiety and somatic symptoms. Like attachment, experiential avoidance may moderate therapeutic outcome and therefore may be essential to understanding the psychological mechanisms underpinning TCM as a treatment protocol. However, it is important to state that the avoidance aspect of EA is not the same as avoidant attachment. Those who have a tendency towards an avoidant attachment style would not necessarily suffer from high levels of experiential avoidance. EA is specifically related to the actions and behaviours that result in the avoidance of stressful situations. For example, in PTSD, sufferers who have this condition as a result of going to war may actively avoid attending celebrations on Guy Fawkes night or New Year. Both of these occasions could contain explosions (fireworks), which may trigger the distressful thoughts and/or feelings associated with war and thus exacerbate the PTSD. If this same person did decide to attend such an event, their response to the stress of the explosions would be dependent upon their attachment style. I.E. someone with an avoidant attachment style would confide in themselves and would avoid confiding in others and/or loved ones about their distress. It could be argued that EA is a pre-emptive stressor defence mechanism, whereby an individual will actively avoid stimuli and situations. Whereas, attachment style is more of a reactive, coping mechanism which determines how a person might react to certain situations

or stimuli, as well as an overall model explaining ones' approaches to short and long term interpersonal relationships. Furthermore, from a statistical standpoint the argument that the avoidant component of PTSD is similar to either the avoidant attachment style or experiential avoidance, can be quickly quelled. Correlations between these three constructs have shown correlation coefficients of less than .8(Ross, Hinshaw, & Murdock, 2016; Shear, 2010), which indicates that whilst they are related, they are not the same thing (Field, 2013).

Experiential avoidance could help to understand if a persons' tendency not to confront stressful situations and stimuli, is linked to their presentation of somatic symptoms and therefore MUS.

1.4 TRADITIONAL CHINESE MEDICINE AND ACUPUNCTURE

Traditional Chinese medicine (TCM) is a form of holistic, alternative medicine that originates from China around five thousand years ago (Eckman, 2007). TCM as a system of medicine takes many forms, but is most regularly associated with the application of acupuncture needles and prescription of herbal remedies to treat a number of ailments. Acupuncture is the process of inserting fine solid point needles into the body at specific points along energy lines known as meridians in order to reduce, increase or unblock energy (qi[2]) in or around the points or along the meridians. The practice of TCM may also include treatments such as massage, known as tuina (pronounced twi na), moxibustion, which is the burning of herbs on the surface of the skin and cupping which is the process of pulling a vacuum either with the use of heat or a pump on a cup in order to stimulate acupuncture points. For the purposes of this thesis TCM will exclusively refer to the practice of acupuncture without any additional components unless otherwise stated. TCM is becoming increasingly popular in the western world (Reynolds, Bland, & MacPherson, 2008), with an estimated 500 million individuals

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[2] Qi pronounced 'Chi', is believed to be a life-force that is present in all living beings. The manipulation of qi is believed to be a fundamental attribute of acupuncture's healing effects.

regularly receive complementary or alternative medicines in Europe alone (WHO, 2013). According to WHO (2013), worldwide, there are increasing sales and greater demand for all TCM related services. Sharples, van Haselen, and Fisher (2003) suggest that dissatisfaction with NHS treatment is the main reason for patients seeking alternative therapies. This lack of satisfaction may be directly proportional to the participants in the study presenting with MUS. Additionally, research conducted in Switzerland showed evidence to suggest that those who chose a GP who was also trained in some form of complementary or alternative medicine (CAM) showed significantly greater satisfaction compared to those who were patients of GPs who had only been trained in conventional medicine (COM) (Michlig et al., 2008). It is proposed that the additional training that CAM provides results in practitioners that take a more holistic approach, which may improve patient satisfaction. CAM approaches to consultation and treatment often align with a reattribution model approach (as discussed in Chap. 1.1.2.3), patients are often taken through a full history of their symptoms, and are generally asked questions about other symptoms and bodily functions as part of the holistic consultation, most CAM therapies also include some level of physical examination. This information is then fed back to the patient usually in reference to underlying theory of the CAM therapy, and links are made between how clusters of symptoms (physical and psychological) may be connected from the perspective of the therapies theory. A follow-up of treatments is then provided where patients are able to discuss progress and concerns with their practitioner. This system of consultation and treatment may result in CAM therapies, namely TCM, being effective for MUS.

1.4.1 ACUPUNCTURE FOR SOMATIC SYMPTOMS AND MUS

Fritzsche et al. (2011) conducted a study involving 96 participants who screened positive for multiple somatoform symptoms. Participants completed a number of measures relating to their interactions with their physician, their symptoms, levels of emotional distress and treatment satisfaction. Participants' physicians also completed a questionnaire about the applied or recommended treatment for the patient. Participants were either attending a

conventional medical establishment or a traditional Chinese medicine clinic. Results suggested that patient satisfaction with TCM is significantly higher than in either biomedicine or psychosomatic medicine (conventional medicine), thus suggesting individuals may be more receptive to TCM as a treatment for MUS. However, results do not provide objective measurement of symptoms or quality of life pre- and post-treatment. Therefore, it cannot be assumed that satisfaction directly relates to a positive treatment outcome. A literature search was conducted on 04/06/2016 and revealed a single study that has attempted to investigate the efficacy of acupuncture in the treatment of MUS. The search consisted a search of the 'MEDLINE' and 'CINAHL' databases with keywords in the title of "Medically Unexplained Symptoms" and "acupuncture". There were a total of 12 studies, duplicates and opinions pieces were first removed, of which there were 10. No further results were found if the keyword "medically unexplained symptoms" was changed to any of the following; "somatic distress", "somatic symptoms or "somatoform disorder". This left two studies, the first was the previously mentioned Paterson et al. (2011) and the other, was a qualitative study by Rugg, Paterson, Britten, Bridges, and Griffiths (2011) who interviewed participants who were in the study by Paterson et al. (2011) before and after their acupuncture treatment in order to establish how participants perceived and experienced their acupuncture treatment. This study was also excluded as is was not concerned with the outcomes of the treatment, but instead the experiences and perceptions of the participants regarding the process of being referred and receiving acupuncture as a treatment. The literature search revealed a single study that has attempted to investigate the effectiveness of acupuncture for MUS. Paterson et al. (2011) conducted a randomised control trial to investigate the potential for Traditional Chinese Acupuncture (TCA) to treat MUS, participants (*N*=80) were randomised into either a treatment group or a waiting list control group. Practitioners, participants and researchers were not blind to the group allocation. Results showed that TCA was significantly better than the waiting list control in reducing symptoms of MUS. Whilst positive, there are a number of empirical limitations of these findings; firstly, patients, practitioners and researchers not being blind to the allocation of participants could have resulted in demand characteristics by

patients and/or influence of practitioners on patient outcomes. Furthermore, the outcome measures used, whilst not out of line with other acupuncture research, were not specific to MUS and may have not measured the constructs relevant to the research question. Many psychological and medical research papers have relied on psychometrics that have demonstrated greater reliability and accuracy in the measurement of MUS (Al-sayyad, Saddick, & Al-Omer, 2010; Bener, Dafeeah, Chaturvedi, & Bhugra, 2013; Mölsä et al., 2014; Sheikh & Furnham, 2012; Taylor et al., 2000). However, a more stringent and pragmatic approach is required to address the methodological issues of this piece of research. This line of critique has been supported by editors of the British Medical Journal (BMJ) who responded to the uptake of the popular media regarding this piece of research. McCartney (2011) suggested that the results were open to great bias and that single or double blinding of participants and/or practitioner would be the gold standard in testing this research question.

Rather than focusing on MUS as a whole, studies have instead focused on other functional syndromes that come under the umbrella of MUS such as IBS, fibromyalgia etc. Whilst from a medical perspective this may seem a logical approach as reduction of confounding variables such as different patient presentations is beneficial in empirical research, the definition of MUS which is also known as somatoform disorder (Morrison, 2014) encompasses all of the functional syndromes which have been isolated in the research literature. For example, in a meta-analysis of acupuncture for the treatment of IBS which included six double blind placebo controlled randomised trials, results showed that acupuncture provides a clinically significant control of symptoms. This evidence is supported by the findings of MacPherson et al. (2012) who conducted a randomised control trial including 233 participants who either received 10 weekly acupuncture session or usual care. Results showed that those in the acupuncture group showed significant improvement over those provided with usual care. Conversely in a study involving 230 IBS patients who were randomly assigned to either sham or genuine acupuncture results showed that there were

no significant differences between trial arms (Lembo et al., 2009). The methodology for this particular piece of research was non-conventional in that all participants first received sham acupuncture and were only randomised after three sham treatments. The fact that all participants received sham acupuncture could impact the results of this study. Further to this, all patient practitioner interactions were restricted to either limited communication or augmented, which may have impacted the ability for practitioners to treat patients in an ecologically valid manner. In the treatment of tension-type headaches which are considered under the umbrella of MUS, results from a randomised control trial of 270 participants, shows that acupuncture is more effective than no treatment (Melchart et al., 2005). In a systematic review of controlled clinical trials for the treatment of fibromyalgia, acupuncture has been shown to provide a small analgesic effect, the author comments that these effects may simply be due to bias and therefore acupuncture cannot be recommended for the treatment of fibromyalgia (Langhorst, Klose, Musial, Irnich, & Häuser, 2010). However, a preliminary randomised control trial showed that acupuncture was an effective treatment for those suffering with fibromyalgia. This study only included 16 fibromyalgia patients and further testing would be required to validate the findings of this study (Itoh & Kitakoji, 2010). Quasi-experimental results from 22 participants also showed that acupuncture was an effective treatment for those with fibromyalgia (Singh, Wu, Hwang, & Khorsan, 2006), despite lower scientific rigour these results may suggest that approaches taken in randomised control trials may be inhibiting the effects of acupuncture therapy, as a holistic therapy with a complex diagnostic and treatment protocol certain restrictions imposed on practitioners may impede their ability to effectively treat patients. In addition, these studies have not explored the possible mechanisms by which acupuncture may operate.

1.4.2 ACUPUNCTURE AND ENDOGENOUS OPIOIDS

There are many theories as to how acupuncture might achieve some of its therapeutic effects. Many, if not all, of them are routed in social, biological and neurological sciences and do not engage with the ancient ideology of meridians (channels of energy) and qi. Evidence

indicates that the anti-inflammatory and analgesic effects of acupuncture are largely due to the engagement of the endogenous opioid system (Han, 2004; Ma, 2004). This system is present in the body in order to reduce pain from mild injury to trauma; it has even been implicated in the suppression of pain from social rejection (MacDonald & Leary, 2005; Master et al., 2009) (see 1.2.1). In addition to the analgesic and anti-inflammatory effects, acupuncture has also been shown to improve symptoms of depression and anxiety (Errington-Evans, 2012; Wu, Yeung, Schnyer, Wang, & Mischoulon, 2012), the primary mechanism of this change is believed to be increases of serotonin and enkephalins associated with the endogenous opioid elicitation. A definitive understanding of exactly how this elicitation takes place is not yet available and not fully understood. Further support of the role of opioid endorphins in acupuncture is present in a study by Pomeranz and Chiu (1976), the took mice and gave them acupuncture whilst exposing them to a heat pain stimuli, they noted that squeak latency increased by 54% suggesting an analgesic effect. They conclude that although endorphins are released in normal mice during such pain stimulation, the rates during acupuncture are significantly higher. Several studies have confirmed the activation of the endogenous opioid system in acupuncture using two main methods. Firstly, using a drug known as naloxone (commonly used to reverse the effects of a heroin overdose), naloxone antagonises opiate receptors in the brain rendering endogenous opioid useless, research has found that acupunctures analgesic effect can be reversed by administering this drug to patients (Pomeranz & Chiu, 1976). Secondly, research has actively measured endogenous opioid levels in cerebrospinal fluid and observed increases after acupuncture treatment in both animal and human participants (Lianfang, 1987). Increases in these endorphins, namely β-endorphins and Enkephalins are associated with increased feelings or wellbeing and better pain control and most importantly a reduction in expression of medically unexplained symptoms (Cassel, 1997). Research has confirmed this same brain chemistry altering effect of acupuncture in a study on heroin addicts (Clement-Jones et al., 1979).

A realistic treatment approach to MUS would benefit patients and the NHS due to accelerated improvement of symptoms, patient satisfaction and financial savings (Michlig et al., 2008). It may further reduce costs as treatment length for TCM would be shorter than for other methods that have been investigated such as CBT. Schroder et al. (2012) provided 16 weekly sessions of CBT, whereas the current study may gain similar efficacy after just 5 weeks. The demands on patients are much lower in TCM and treatment attrition may be less of an issue. An understanding of the possible mechanisms/models used in CBT may be transferable to TCM. The reattribution model (see 1.1.2.3) may have been inadvertently operating in TCM for thousands of years (Paterson et al., 2011), if this is the key mechanism that explains acupuncture's efficacy then no difference would be expected between placebo and treatment groups in placebo controlled trials. The same can be said for the endogenous opioid mechanism, if the penetration of an acupuncture needle alone elicits endorphin release in the brain then it would be expected that on measures of psychological and physical distress (which are closely linked to this system) there would be a difference between genuine and non-penetrating placebo acupuncture.

1.4.3 THE ROLE OF ATTACHMENT IN ACUPUNCTURE

In addition to these factors it has been suggested that insecure childhood and adult attachment may be an additional factor that may increase the severity of MUS (Kolb, 1982; Meredith et al., 2008). For example individuals that have an insecure attachment style are more likely to be suffering with MUS and have lower pain thresholds compared to secure individuals (Kolb, 1982; Meredith et al., 2008)(see 1.2.1). It is therefore important to understand the relationship between attachment and MUS and the if the relationship is impacted by acupuncture therapy. A literature search conducted on the 04/06/2016 of the MEDLINE and CINAHL data bases using the title keywords "acupuncture" and "attachment" resulted in three results. One result was excluded as it was a duplicate of a paper that was investigating the soluable N-ethylmalemimide-sensitive Factor attachment protein in rats when given acupuncture during depression remission (Fan et al., 2016). This paper was

excluded as the subject was not psychological attachment. This left a single result which was a paper published by myself and my supervisor on research undertaken prior to this thesis (Sochos & Bennett, 2016). Sochos and Bennett (2016) have shown evidence that attachment style moderates the therapeutic outcome of TCM; however, a deeper understanding of the relationship between the client and practitioner attachment style and the therapeutic outcome may help to explain some percentage of the therapeutic effect. Mallinckrodt, Gantt, and Coble (1995) suggest that in psychotherapy, the development and subsequent change of the client-practitioner attachment style is a key factor in eliciting therapeutic change, hence the observation of this in a TCM setting may support a cross disciplinary clinical effect that practitioners could benefit from understanding. Alternatively, the absence of such an effect involving both practitioner and patient could indicate an effect triggered purely from the penetration of acupuncture needs and the subsequent release of endogenous opioid. Furthermore, understanding the role of attachment in the placebo effect would provide a novel insight into this under-researched phenomenon.

CHAPTER 2 – METHODOLOGY

2.0 EPISTEMOLOGICAL UNDERPINNINGS

In this section, I will argue that it is possible to have a quantitative empirical research approach that is not reductionist, and that this is the basis of my epistemological approach. What I mean by this is that the approach can be non-dualist but at the same time holistic, in that the mind and body are understood as being closely interlinked, and establishing that psychological phenomena cannot be fully understood without reference to wider configurations not present in an individual alone (I.E. interpersonal and other social interactions). Furthermore, I would argue that the experimental method, being by its very definition, reductionist has seen a revival in contemporary psychological research. Whereby, psychologists are no longer as concerned with isolating and manipulating phenomena in order to observe how they interact. Instead the focus has become more about the effects of manipulations on the system. This is best explained by Reber and Beckstead (2009) who explain in their book chapter about systems theory. They state that systems theory focuses on the interrelationship of social and natural phenomena in in juxtaposition to the reductionist view that the whole is made up of the sum of its constituent parts and that these should be studied in isolation. It is argued that the Cartesian framework and the reductionist experimental method, whilst useful for investigating simple systems, could not adequately capture the wildly variable nature of the physical and social world. Systems approach and methodology suggests that researchers much investigate a system in its entirety in order to be able to understand the system as a whole. This could be likened to TCM, attachment, and MUS, the system must first be investigated as a whole before the analysis and investigation of the constituent parts can be undertaken. That is, core psychological and physiological processes cannot be understood without also understanding the role of relationships and their internalisations. Once this is complete, sub-whole enquiry can then be undertaken with an appreciation for the whole and the interrelationships that make up the system.

Systems theory has acted as a framework in many methodologies, however, was initially intended for use with the systematic and rigorous approach of experimentation. This may seem counterintuitive as the experimental method can only offer a limited view of a system in its traditional form, but it was, and is, still upheld as a powerful empirical causation tool. Empirical experimentation, along with a systems approach is the approach selected for the investigation of the topic areas of this thesis. The combination of scientific rigor with the overall critical stance that has been developed towards quantitative research should allow for a fair and balanced approach to addressing the aims of the studies included in this thesis.

2.0.1 WHY QUANTITATIVE RESEARCH?

The two studies reported in this thesis are quantitative in nature. The primary reason for this was the need to determine causation. The primary aim of study 1 and 2 is to determine if acupuncture was efficacious in the treatment of somatic and psychological distress. Given that human distress is being investigated it is essential to establish causation an effectively as possible. This effectiveness cannot be determined by subjective individual experiences of participants but instead, there must be an attempt to quantify effects and generalise them to the wider population. Second to this, it would have been ethically and morally questionable to attempt to address the aim of this thesis by qualitative methods alone. The reason for this, is that it would have been unreasonable to subject participants to a treatment for which there is no evidence of its efficacy in treating the complaint. A mixed methods approach would have been possible, the primary aims of this thesis were to explore the causal relationships between placebo vs. acupuncture treatment and improvement of somatic or psychological symptoms, whilst exploring potential psychological mechanisms (attachment and experiential avoidance). A mixed methods approach would have diluted my ability to so concisely address these questions.

2.1 METHODOLOGY OVERVIEW

This thesis consists of two studies, the first, a double-blind randomised control trial and the second a quasi-experimental multi-centre study. Study 1 aims to assess the overall efficacy of acupuncture in the treatment of psychological and somatic distress, whilst exploring the influence that attachment and experiential avoidance might have on the treatment outcome (between placebo and genuine acupuncture) which has been partially seen in previous research. Study 2 has been designed to replicate any findings that may indicate that acupuncture is effective in Study 1 by recording data from real world clinics. Once again, study 2 will also attempt to replicate findings pertaining to attachment and experiential avoidance in order to validate the findings of study 1 and address the potential weakness of ecological validity. The flow diagram below (Fig. 2.1) illustrates this.
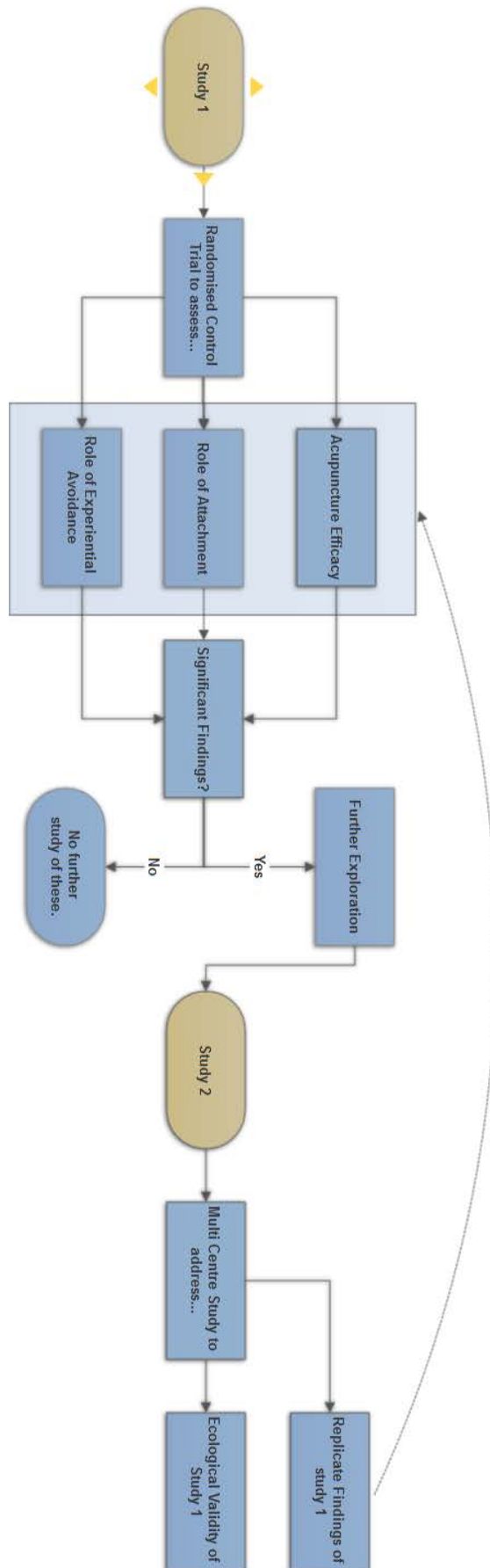
Figure 2.1 – A flow diagram of studies contained in this thesis.

2.2 STUDY 1

2.2.1 DESIGN

The study was an experimental, factorial, double blind, randomised, placebo controlled trial. The independent variable, which was randomly manipulated using the minimisation randomisation technique (Saghaei & Saghaei, 2011), was the type of treatment and consisted of two levels; genuine acupuncture or placebo acupuncture. The repeated measures factor was time point consisting of pre-treatment, post-treatment and 8-week follow-up. Primary outcomes (dependant variables) were the scores of the GHQ-12 and the BSI; secondary outcomes (co-variants, predictors and/or moderators) were the CATS, MEAQ and the RQ (see 2.2.3.3 for acronym definitions). Extraneous variables were controlled for at the time of randomisation by ensuring both trial arms were balanced for gender and somatisation (BSI) (See Table 2.2.2.1).

2.2.2 PARTICIPANTS

Participants were recruited via advertisements (both physical and digital) placed in, and around, the University of Bedfordshire. In addition to this, snowballing methods were used by asking participants to recommend participation in the trial to colleagues, friends and family. A total of 139 participants completed the initial online screening questionnaire, of which 97 were eligible to participate. Sixty-three (N=63) participants completed the main pre-post treatment and data collection stage and 52 also submitted follow up measures (see Figure 2.3.2.2.1). The majority of participants were female (n=50, 79.4%) and white (n=46, 73%). The remainder of the participants' ethnicities were made up of Pakistani (n=4), Indian (n=3), Black (n=6) and others (n=4). The age of participants raged from 18 to 69 years (M=38, SD 12.24). Full demographic information can be seen in table 2.2.2.1. Two participants (n=2, 3.2%) presented as scoring high for somatisation, three (n=3, 4.8%) had moderate levels of somatic distress, leaving the remaining participants as Low (n=58, 92.1%) (For low, mid & high categories see of the BSI see. Al-sayyad et al., 2010). The minimisation process

ensured individuals who scored high on the BSI were in separate arms of the trial to reduce potential bias, this same technique was utilised to reduce any potential gender bias (See Table 3.1.1). Participants presented with a number of different health complaints, these were categorised according to the subscales of the BSI with the addition of an 'other' category in order to explain complaints experienced by the participant population (See Table 2.2.2.2).

	Placebo Group (*N*=33)		Treatment Group (*N*=30)	
Age, *M*(*SD*)	38.58	(11.75)	37.1	(12.91)
Female gender, N (%)	27	(82)	23	(77)
Ethnicity, N (%)				
White	23	(70)	23	(77)
Pakistani	3	(9)	1	(3)
Indian	2	(6)	1	(3)
Black African	3	(9)	2	(7)
Black Caribbean	0	(0)	1	(3)
Other	1	(3)	1	(3)
Mixed	1	(3)	1	(3)
MUS Diagnoses: N (%)				
IBS	2	(6)	4	(13)
Pelvic Pain	1	(3)	0	(0)
Psychiatric	3	(9)	3	(10)
Lower Back Pain	5	(15)	3	(10)
Tension Headache	0	(0)	1	(3)
Pre-menstrual Syndrome	0	(0)	1	(3)
Palpitations	1	(3)	1	(3)
Repetitive Strain Injury	1	(3)	0	(0)
Multiple Diagnoses	10	(27)	6	(20)
None	10	(30)	9	(30)

Table 2.2.2.1 – Study 1 demographic information.

In order for participants to take part in the trial a set of exclusion criteria were established to help reduce the effects of extraneous treatments and/or procedures that may skew results. Participants were excluded if they had received acupuncture in the past 5 years; this reduced the likelihood of placebo vs. genuine acupuncture differentiation during treatment, thus keeping participants blind to their group allocation. The current study utilised a form of

placebo acupuncture that is best performed on acupuncture naïve participants (see 2.2.3.4). In pervious validation studies and RCTs utilising the same sham device, both naïve and non-naïve participants were used, however naïve participants remain the preference (Takakura, Takayama, Kawase, & Yajima, 2011; Tan, Christie, St-Georges, & Telford, 2009) other studies fail to mention whether patients are naïve in their reporting of RCTs (See Ng & Yiu, 2013). Dilli et al. (2014) conducted an experiment to determine if previous acupuncture exposure influenced perceptions of sham acupuncture. They found that those who were acupuncture-naïve experienced the sham procedure differently from those who weren't and concluded that future research should be aware of these differences when planning research. Furthermore, research such as that conducted by Foroughipour et al. (2014) excluded participants if they had received acupuncture in the preceding six months to the trial. The current study aimed to minimise noise[3] generated by different perceptions of the sham control by extending this to a five-year abstinence from treatment. Additional exclusion criteria included participants with cancer or a blood born disease (such as HIV, AIDS, Hepatitis A etc.), those who were currently pregnant or breast feeding, had undergone major surgery in the past six months (such as open heart, or organ transplant surgery), were currently receiving anticoagulant therapy (warfarin or heparin etc.), have haemophilia, were needle phobic, been diagnosed with a major depressive episode, psychosis or bipolar disorder or been admitted to a psychiatric unit in the past 5 years. Excluding these participants would have had two main effects, firstly it limits the occurrence of observing effects of other major treatments that are taking place concurrently with the trial and secondly, it limits risk to participants and practitioners. Participants that were currently undergoing treatment for conditions that could be considered medically unexplained, had to agree to a letter being sent to their GP to ensure that participation would not interfere with any existing care plan in place (see 2.3.2.2).

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[3] "Statistical noise" or "noise in the data" can be defined as an increase of random variance caused by a loosely controlled extraneous variable.

Complaint Coded by BSI subscale	Genuine Acupuncture	Placebo Acupuncture	Total
Head	1	1	2
Chest	2	2	4
Abdomen	6	2	8
Fatigue	2	3	5
Heat	1	0	1
Panic	4	1	5
Other	6	11	17

Table 2.2.2.2 – Participants' health complaints

2.2.3 MATERIALS

2.2.3.1 QUESTIONNIARES

Materials used in the study were compiled as a questionnaire pack for each participant that was screened and booked in for their initial treatment appointment. This pack consisted of pre- & post-treatment, paper based questionnaires (See appendix A). In addition to this a screening questionnaire ensured participants met inclusion/exclusion criteria (see 2.2.3) and collected information to enable randomisation.

2.2.3.2 SCREENING QUESTIONNAIRE

Each participant was screened into the trial using an online screening questionnaire. The questionnaire was designed online using a service known as Qualtrics. Questions in the screening questionnaire were forced dichotomy or forced option multiple choice in order to exclude participants according to exclusion criterion outlined in 2.2.3. Participants which were not successfully screened were excluded and informed of this decision appeared instantly on the screen. Rejected participants' data were saved and reviewed to ensure that no false exclusions had been made, once their exclusion was confirmed their data were destroyed. Individuals who were eligible to be entered in to the trial were informed on screen and by email. Participants provided contact information and consented for a researcher to contact them using one of the contact methods provided. Those which were eligible for

inclusion in the trial but had disclosed that they were currently receiving treatment for any one of the list of medically unexplained syndromes/symptoms (MUS), were asked for their general practitioner's (GP) contract information. This enabled the researcher to inform the GP that a patient in their care would like to participate in acupuncture research (see appendix F for an example letter). A 2-week waiting period was put in place in case there was any medical reason why the participant could not take part. In total seven participants declared at the time of screening that they were receiving treatment for MUS, no GP requested that their patient not take part in the trial, or indicated that doing so would jeopardise their existing treatment or entitlement on the NHS. This additional notification of the GP was mandated by the University of Bedfordshire's research ethics committee (UREC) (see appendix D). Lastly, the Bradford Somatic Inventory (BSI)(Mumford, Bavington, et al., 1991b) was administered in order to determine those that were high and low in somatisation, in order to balance trial arms. The screening questionnaire questions can be seen in appendix G.
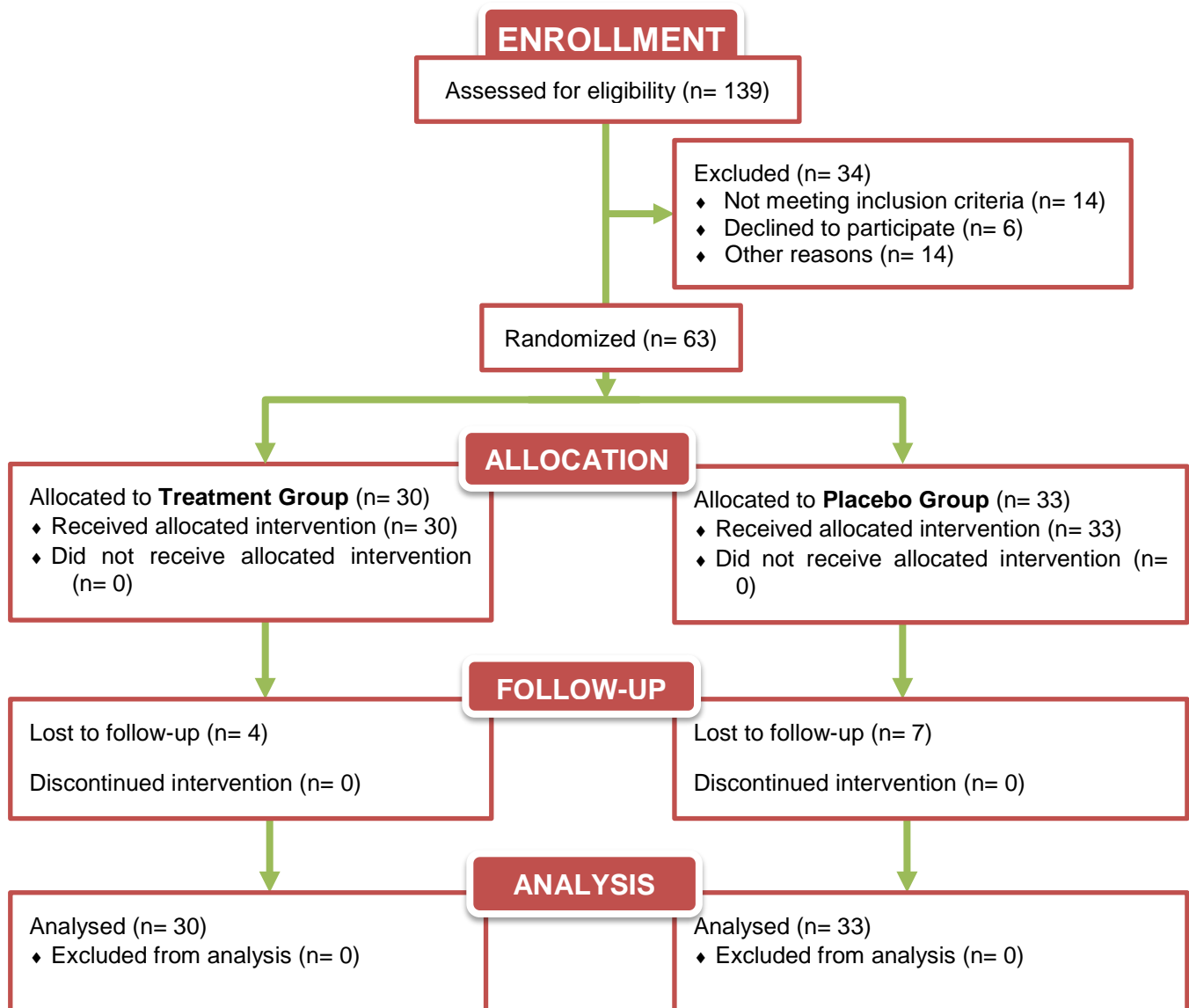
Figure 2.3.2.2.1 – Trial consort diagram

2.2.3.3 TRIAL QUESTIONNIARE

The trial questionnaire consisted of three parts; pre-treatment, post-treatment and follow-up.

The pre, post and follow-up questionnaires contained primary outcomes measures (GHQ-12 & BSI) and the RQ and the MEAQ, which were measured at each time-point. The CATS was only obtained post-treatment to capture the relationship that had formed between client and therapist (in this case acupuncturist) during the treatment sessions.

DEMOGRAPHIC AND HEALTH BACKGROUND QUESTIONNAIRE;

This questionnaire was developed specifically for the purpose of this trial and is an adaptation of the demographic questionnaire used by Sochos and Bennett (2016). It consisted of standard basic demographics such as age, gender and ethnicity. Participants provided information on their main complaint[4], whether they had visited conventional medical services in the six months prior, whether they had been given a diagnosis in those consultations, and how successful those consultations and/or treatments had been (measured using a single question, five-point Likert scale ranging from very successful to very unsuccessful). The current study does not utilise a GP, psychiatrist or other healthcare professional to officially diagnose each participant with MUS. Therefore, participants were then asked to disclose if they had suffered from any of a group of symptoms/conditions that are deemed to be MUS (e.g., irritable bowel syndrome, fibromyalgia, etc.; See Chapter 1.1.1 for full operational definition)(Henningsen & Creed, 2009). Items on this questionnaire were very basic questions as can be seen in appendix A, these questions have face validity and do not require additional validation.

GENERAL HEALTH QUESTIONNAIRE (GHQ-12); (GOLDBERG & HILLIER, 1979).

This instrument is widely used in screening for non-psychotic psychological distress. In the current study the 12-item version was used, based on a four-point Likert scale, where higher scores indicate greater levels of distress. The instrument has demonstrated good scale and test-retest reliability, as well as convergent, discriminant, and criterion validity (Hardy, Shapiro, Haynes, & Rick, 1999). Although there is some disagreement among researchers about the number of factors measured, in most studies, including the present, the GHQ-12 has been used as a unidimesional index of psychological distress. The internal consistency of the scale in the present study was high (α=.89). It's use as a measure of psychological distress has been utilised by acupuncture researchers investigating a number of research areas such as rheumatoid arthritis (David, Townsend, Sathanathan, Kriss, & Dore, 1999),

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[4] The "main complaint" would be described as a patient's primary symptoms that causes them distress or dysfunction in daily life. This may be in the form of a single symptom such as "back ache" or a complete diagnosis (MUS or not) such as "arthritis" or "Irritable Bowel Syndrome".

multiple sclerosis (Donnellan & Shanley, 2008) and tension headaches (White et al., 2000). In addition the GHQ has been recommended by the a subsidiary of the British Medical Journal known as Acupuncture in Medicine (Ward & Simpson, 2003). The recommendation comes in the form of a letter from the editor after a researcher used a post-natal depression scale to measure stress amongst hospice workers. The GHQ has been used in research investigating somatic symptoms, often as a primary outcomes measure (Ando et al., 2013; Bener et al., 2013; Frydecka, Malyszczak, Chachaj, & Kiejna, 2011; Morina et al., 2010). The evidencable reliability and validity, its use in previous literature investigating similar areas, and its short and easy to complete nature were the primary reasons for deciding to use this questionnaire as part of both of the studies in this thesis.

BRADFORD SOMATIC INVENTORY (BSI); (MUMFORD, BAVINGTON, ET AL., 1991B).

This is a 46-item questionnaire measuring physical somatic symptoms. In addition to white British samples, this questionnaire has also been validated in a variety of ethnic minority groups living in Britain and abroad, and there is evidence to support its use in capturing culturally-specific somatic expressions of distress(Mumford, Tareen, Bajwa, et al., 1991; Mumford, Tareen, Bhatti, et al., 1991). The questionnaire identifies eight common areas of somatic symptoms, forming an equal number of subscales: head, chest, abdomen, fatigue, heat, Globus hystericus, and panic. A 7-point Likert scale to measure intensity of symptoms was used pre-post treatment and at follow up. This adaptation was recently utilised to determine intensity of somatic symptoms rather than frequency in a piece of research by Sochos and Bennett (2016). The original three-point scale indicating the length of time symptoms were experienced was used at screening in order to classify participants on somatisation level (Al-sayyad et al., 2010; Mumford, Bavington, et al., 1991b). The scale is currently obtaining high overall internal scale consistency ($\alpha=.94$).

The rationale behind using this scale in both studies is two-fold. Firstly, this scale appears to one of very few that exclusively measures somatic symptoms that has also been validated cross-culturally (Mumford, Tareen, Bajwa, et al., 1991; Mumford, Tareen, Bhatti, et al., 1991;

Mumford, 1989; Mumford, Bavington, et al., 1991a). With an ethnically and culturally diverse population in Bedfordshire where the study primarily took place, it stands to reason that a measure that has been validated in this manner would be beneficial. Secondly, this questionnaire has also been used in a variety of studies to attempt to quantify improvement of somatic symptoms. An example of one such study is (Sumathipala, Hewege, Hanwella, & Mann, 2000), they used the BSI in a randomised control trial for medically unexplained symptoms. It was more recently used in Italy to compare somatic presentations of immigrants in primary care (Aragona et al., 2005). Alongside these two tangible and supported reasons, it was felt that as I had used this item previously, the familiarity with the item would also be beneficial.

RELATIONSHIP QUESTIONNAIRE (RQ); (BARTHOLOMEW & HOROWITZ, 1991).

The RQ includes four small paragraphs, providing different attachment-related descriptions of self and other. Using a 7-point Likert scale, each of these paragraphs measures the extent to which participants present the characteristics of the four attachment styles: secure, dismissing, preoccupied, and fearful. As the authors suggest, a secure style is characterised by positive models of self and others, a dismissing style by a positive model of self and negative model of others, a preoccupied style by a negative model of self and a positive model of others, and a fearful style by a negative model of both self and other. Its reliability and validity are evidenced by, its repeated recommendations in reviews of adult attachment measures (Bäackström & Holmes, 2001; Bartholomew & Shaver, 1998; Ravitz, Maunder, Hunter, Sthankiya, & Lancee, 2010). The choice of this questionnaire for this piece of research was made initially on the basis of previous use and evidence of validity and reliability. In addition to this, the 4-item questionnaire is very quick and easy to complete and minimises burden on the part of the participant. Lastly, for the purpose of analysis it resulted in 4 variables representing each of the 4 attachment styles which could be easily be used as covariates and moderators in analysis with minimal additional manipulation.

CLIENT ATTACHMENT TO THERAPIST SCALE (CATS); (MALLINCKRODT ET AL., 1995).

The CATS questionnaire is a 36-item scale that evaluates the attachment styles between the client and therapist. The scale has three subscales which are linked to secure, avoidant and preoccupied attachment styles, these styles of attachment mirror the styles mentioned for the RQ. Internal consistency of this measure in the present study showed high inter item relatedness (α=.86). The scale has been used to explain elements of therapeutic change in psychotherapy, and is widely considered a valid measure (Bachelor, Meunier, Laverdiere, & Gamache, 2010; Janzen, Fitzpatrick, & Drapeau, 2008; Levy et al., 2006; Mallinckrodt & Jeong, 2015; Mallinckrodt, Porter, & Kivlighan Jr, 2005; Woodhouse, Schlosser, Crook, Ligiéro, & Gelso, 2003). The decision for its use was anchored in its repeated use in the literature and a lack of alternative options with such broad usage, and evidence of validity and reliability. At 36 items, it is also relatively short and can be completed quickly by participants.

THE MULTIDIMENSIONAL EXPERIENTIAL AVOIDANCE QUESTIONNAIRE (MEAQ); (GÁMEZ, CHMIELEWSKI, KOTOV, RUGGERO, & WATSON, 2011).

This 62-item scale (with 6 subscales) is used to measure experiential avoidance which can be described as a tendency to avoid negative experiences. Three of the six subscales were selected for the purposes of this study; distress aversion, distraction and suppression and repression and denial. These were the constructs which were most likely to be involved in the manifestation of MUS (Morina et al., 2010). Despite this scale being recently designed, it has been used in a wide variety of psychological studies and is quickly gaining support and an evidence base for being a valid scale and internal consistency scores are in line with the literature (α=.91) (Buckner, Zvolensky, Farris, & Hogan, 2013; Knabb & Grigorian-Routon, 2013; Meyer, Morissette, Kimbrel, Kruse, & Gulliver, 2013). Its use in over 100 studies since its initial publication in 2011, it being used as a benchmark to create new measures (Losada, Márquez-González, Romero-Moreno, & López, 2014) as well as validating others(Farris, Zvolensky, DiBello, & Schmidt, 2015) and very few alternatives being available with the same level of supporting literature, was the reason for its inclusion in both studies included in this thesis.

2.2.3.4 ACUPUNCTURE

Acupuncture sessions for the trial were given in an existing acupuncture clinic in Luton. The practitioner involved in the study was fully qualified and insured for the practice of acupuncture and herbal medicine and had one-year post-qualification experience. Acupuncture sessions were carried out using the Traditional Chinese Medicine (TCM) framework, whereby during the first appointment an in-depth consultation took place, which consisted of taking patient history, questioning about the main complaint and all other aspects of health, palpating the patients pulse, and observing the tongue. Prior to acupuncture being given, the practitioner would discuss the TCM diagnosis and explain what it meant and how the acupuncture may be able to help. Acupuncture point selection followed the principals of TCM to ensure a holistic treatment. Selected points had to fit in to either, local points, distal points, syndrome points or experiential points. Where possible, the practitioner would attempt to use points which encapsulated more than one of these selection criteria. A maximum total of twelve needles were used in any one session of acupuncture, this number of needles was not out of the ordinary for treatment using TCM principals (Ceccherelli, Gioioso, Casale, Gagliardi, & Ori, 2010). Another reason for using 12 needles per patient was made largely due to funding of the needles. Sham needles are expensive and a small grant was awarded for the purchase of the needles, the result was that 12 needles per participant enabled up to 150 participants to be collected for this study. This was a pragmatic trade-off between having enough participants to achieve statistical power (in the event of a non-significant result) and inserting enough needles to achieve clinically. Too few participants would mean more needles could be used, but analysis would lack power, and too many participants would have meant that too few needles would have been available for use. Due to the nature of TCM and its diagnostic principals, patients rarely receive the same treatment, even those who have the same main complaint may have some of the twelve needles inserted at different acupuncture points. As such, this study made no attempt to collect and analyse, acupuncture point selection, syndrome diagnosis, tongue or pulse picture. This was because it was not an aim of this study to attempt to understand

which points were most effective. It was felt by the principal investigator that the restriction of point selection would detract from the fundamental holistic approach of TCM and therefore it was left open for the practitioner to select the points that he saw fit. This is also in line with the underlying epistemology of this thesis, of non-reductionist empiricism. The decision not to collect acupuncture point information was made in order to prevent overburdening the PI who was administering the acupuncture treatment. This is a rare approach in acupuncture research as research often tries to isolate the core function of particular points for specific ailments, which is a logical approach according to reductionist, positivist western science, but it directly contradicts the ethos of this form of medicine. For example, Melchart et al. (2005) used a standardised acupuncture approach which included basic points that all patients would receive, followed by optional points chosen by the practitioner based on patients' presentation. This method works relatively well and in keeping with the holistic approach when a piece of research is treating one ailment. However, in the current study, somatic and psychological distress encompasses multiple, varied physical manifestations; therefore, this would have not been a practical approach.

To conduct a double-blind study of acupuncture, both participant and practitioner would have to be naïve to whether the needle penetrated the skin of the participant. Therefore, a patented placebo acupuncture device was utilised, known as the Park sham-acupuncture device (PSD) (Park, White, Stevinson, Ernst, & James, 2002). This device masked, both to the participant and the practitioner as to whether the needle punctured the skin. The device was designed for the purposes of testing genuine acupuncture against a placebo form of sham acupuncture (Park, White, Lee, & Ernst, 1999). Park et al. (1999) developed a telescopic sham (blunt) needle, that, when used in combination with the PSD can obscure from the participant and the practitioner whether the needle has penetrated the skin. Since its original development there have been a number of validation studies to test the PSD efficacy as a single and double blind device. Tan et al. (2009) conducted a study to test the potential for discrimination between real and sham needles using the PSD and found that

when combining traditional and non-traditional points there was no discrimination. When using traditional points alone participants were able to discriminate between the real and sham acupuncture. However, it is important to note that the points used in this study were on one part of the body (the forearm) and this was not tested in a clinical setting, so lacked a level of ecological validity. In addition, participants received both placebo and genuine needles concurrently increasing the chances of discrimination. The use of a blunt needle sham (without the PSD) has been also validated as a credible sham control (Tough, White, Richards, Lord, & Campbell, 2009). Takakura et al. (2011) conducted a validation study to test the efficacy of the PSD as a double-blind sham acupuncture tool. Their results suggested that participants were unable to distinguish between placebo vs. treatment needles when used in conjunction with the PSD, they also stated that there were no differences in sensations of penetration ("de qi"[5]) between participants. It is concluded that provided the protocol is rigorous the PSD may be used as a double-blind sham acupuncture control in RCTs.

The decision to use a sham needle control, namely the PSD was made as it was felt that it was the only affordable, and realistic solution to answer the aims and hypotheses of this study. In addition, there is a wealth of supporting literature for its validity as a research device as stated above (Park et al., 2002; Park et al., 2005; Park, 2009; Takakura et al., 2011; Tan et al., 2009; Whale, MacLaran, Whale, & Barnett, 2009). Alternative methods would have also resulted in a higher risk of un-blinding practitioner and participants and it would have been impossible to implement a protocol to avoid this. The PSD is unique in that it holds the needle in place meaning that during the insertion and removal of the needle, both participant and practitioner are unaware of whether it penetrated the skin. Furthermore,

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[5] "De qi", pronounced "Dey Chi" is believed to be the sensation at an acupuncture point when qi or energy is present, this is a positive sensation, and comes in many forms, but is often associated with a dull ache, but can also be a sharp electric sensation, or a warming sensation.

a study by MacPherson et al. (2014) found that the effect size of acupuncture was statistically at its greatest when compared to a non-penetrating sham device like the PSD.

2.2.4 PROCEDURE

2.2.4.1 SCREENING AND RANDOMISATION

Participants responded to links provided on several forms of advertisement for the study. All adverts stated that the research was for acupuncture, and asked viewers if they were "feeling under the weather?" if so, they might want to try acupuncture. The link was provided as a shortened URL using the Bitly system (http://www.bit.ly) a QR[6] code was also on all adverts, which potential participants could scan on a mobile device and would then be taken directly to the screening questionnaire. Once participants arrived at the Qualtrics website they were given some general information about the trial, it was made clear that this initial questionnaire would assess their eligibility to take part in the trial, and that the trial would consist of receiving 5 weeks of either placebo or genuine acupuncture. Contact information of the PI was provided should anyone have queries regarding the study or wish to withdraw. Before continuing to the screening questionnaire participants had to consent to taking part in the study overall and to be contacted (if eligible) by a researcher in order to book their first appointment. Upon completion of the questionnaire participants were instantly informed of their eligibility as the Qualtrics system validated participants' responses in-line with in with the inclusion/exclusion criteria (see 2.2.1). Eligible participants' details were then emailed to the PI who then contacted them in order to book their first appointment, during this process participants were again reminded that the trial required 5 consecutive appointments to be made, this acted like a second line screening for participants who either hadn't read or didn't fully understand the consent section of the screening questionnaire. This secondary availability screening reduced the number of dropouts observed between pre- and post-treatment. Once participants were booked in the randomisation process could begin. The PI assigned participants with a random four-digit identifier, this number would remain with the participant throughout the trial to; ensure anonymity, enable easy withdrawal of data and

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[6] A 'QR' code is a small square barcode that may be scanned with a mobile device. Upon scanning the device will navigate to the URL that is encoded in to the barcode. This is a common marketing tool for enabling people to quickly input complicated URLs without the need to type them in to their device.

allow pre-, post-, and follow-up data to be re-united for analysis. This four-digit code along with the date of birth, gender and BSI score categorised as either HIGH (>40) or LOW (<40) were sent to a research assistant (RA) who would then randomise the participant. The RA was responsible for using a piece of software called 'qminim' (Saghaei & Saghaei, 2011) to randomise participants, this software uses the minimisation randomisation technique. This enables clinical trials to balance trial arms whilst still randomly assigning participants, for the purposes of this trial, treatment and placebo arms of the trial were balanced for gender and BSI score. This ensured that there would be an approximately equal number of males and females in both treatment and placebo groups, and an equal number of high and low somatisers. The software then informed the RA which group the participant had been allocated to, this was then logged and stored in an excel spread sheet (in case of catastrophic failure of the software), on a secure server behind a password that only the RA knew. The RA would then take an envelope and write the unique participant identifier on the front and insert either sixty placebo or treatment needles, along with pre-, post-, and follow-up questionnaires (which also had the unique identifier printed on each page). The RA only worked with unique identifier numbers and not names, it was deemed safe for the PI and the RA to communicate as should the PI mention the name of the participant there was little chance of un-blinding. The PI then collected the envelopes containing the sham or genuine needles, and questionnaires before the initial appointment.

2.2.4.2 ACUPUNCTURE SESSIONS

At the initial appointment the PI (who was also the sole practitioner) welcomed participants to the clinic and invited them to take a seat in the waiting room, where the participant was asked to complete pre-treatment measures (in isolation from researchers). This included a further in-depth consent form, which informed participants that they would receive five weeks of genuine of placebo acupuncture and that they and the PI would not know which treatment they were receiving. Participants were informed that if at the end of the trial that they were in the placebo group, they would be offered the opportunity to take five free genuine

acupuncture sessions. On completion the participants were taken to a treatment room where they began their initial session (see 2.3.2.3 for acupuncture protocol). Participants were generally booked in for 5 weekly treatments on the same day and time of the week. It was highlighted to the participant the importance of completing the sessions within the timeframe as this may affect the results of the study. No participant took longer than 6 weeks to complete the 5 treatments and all participants had a minimum of five treatments over five weeks. The primary reason for selecting 5 treatment session was, previous literature indicating that the most frequently used trial length is between 4 and 6 weekly sessions. For example in a meta-analysis for acupuncture to treat IBS, out of nineteen trials eleven used between 4 and 6 weekly treatments (Manheimer et al., 2012). Another meta-analysis investigating acupunctures effectiveness in treating osteoarthritis of the knee had an average treatment length of 8 weeks (Manheimer, Linde, Lao, Bouter, & Berman, 2007). Zhang, Chen, Yip, Ng, and Wong (2010) conducted a meta-analysis consisting of 20 acupuncture trials for the treatment of depression, the average treatment length of all included trials was 6.8 weeks. An additional reason for restricting treatment length to 5 weekly sessions was a combination of pragmatism, in that there were only a finite number of sham needles available for use due to funding restrictions.

During the five acupuncture sessions patients tongue and pulse were taken and some general questions were asked relating to their main complaint, changes in acupuncture points were made according to TCM practise. If new symptoms had emerged, treatment would be amended accordingly to attempt to treat this, if they participant indicated that this was not their main complaint. Conversation surrounding the group allocation instigated by the patient was always met with a neutral response from the practitioner and an explanation of how it would be impossible to ascertain which group they were in was reinforced. On completion of the final session the post-treatment questionnaire pack was given to participants to complete in the waiting area of the clinic. Upon completion participants were

thanked for their time and it was advised that they would receive an email in 8 weeks requesting that they complete a follow-up questionnaire.

2.2.4.3 FOLLOW-UP QUESTIONNAIRE AND UN-BLINDING

Eight weeks following the final appointment an email was sent to the participant inviting them to participate in a follow-up questionnaire. A link was provided in the email to a Qualtrics questionnaire. Once completed the PI would receive an email which would instigate a final email which would un-blind the participant. If the participant was in the placebo group, they were informed of how to claim their five free acupuncture sessions. These five free sessions could be taken within twelve months of completion of the follow-up measures. Participants that were in the treatment group were thanked for their participation and time, and were provided with the contact information of the PI once more in case they had any further questions regarding the study and its outcomes.

2.2.4.4 STATISTICAL ANALYSIS

All statistical analyses were undertaken using SPSS 21 (unless otherwise stated), data was entered from hard copies of questionnaires or imported and combined with hard copy data from exports from Qualtrics. This section will address the analyses relating to each hypothesis of the study beginning with the primary outcome measures.

Primary Outcome Measures

The primary objective of study one was to ascertain if acupuncture treatment can significantly reduce psychological distress and somatic symptoms when compared to placebo treatment. To test this hypothesis a 2 x 2 mixed effects multivariate analysis of variance (MANOVAs) will be conducted. Correlations of the two DVs suggest a relationship that warrants investigation with a MANOVA (Field, 2013), doing so will increase statistical detection power beyond that of two separate ANOVAs. The repeated factor for this test will

be the pre-post treatment time points whilst the between subjects' factor will be the group the participant was assigned to. Primary outcomes (DVs) are the BSI and GHQ-12. A further MANOVA will be conducted using only the sub-scales of the BSI in order to explore the effects on specific clusters of somatic symptoms. It is predicted that on all sub-scales the reduction will be greater in the treatment group than in the placebo group.

The reason for not undertaking one large MANOVA to test the pre-post-follow-up scores at the same time is that there is that there is a theoretical expectation that scores will increase again between post-treatment and follow-up (for both acupuncture and placebo groups). There are two separate effect points in this study, one where an intervention took place (pre-treatment to post-treatment) and one where it didn't (post-treatment to follow-up). To analyse both simultaneously would be both a theoretical and analytical mistake that would result in inflated chances of type 2 error. However, to further investigate the differences between the placebo and treatment group at follow-up a second 2 x 2 MANOVA will be conducted which will include post-treatment scores and follow up scores for both BSI and GHQ-12. Doing so will provide evidence to support the hypothesis that the acupuncture effect will remain significantly reduced at follow-up compared to pre-treatment scores. The repeated and between subjects' factors and DVs will remain the same as the initial MANOVA. Once again, a further exploration of the sub-scale of the BSI will provide information about specific clusters of symptoms between post and follow-up treatment points. It is predicted that there will be no significant change in any of the symptoms in either placebo or treatment group on the BSI sub-scales.

In order to explore the differences in treatment efficacy between those who report MUS or are high somatisers compared to those who are not, a 2 x 2 x 2 MANOVA will be conducted. This will consist of the randomly manipulated IV (trial group), the between subjects' factor MUS status and a repeated measures factor of treatment time point (pre-treatment and post-treatment. For the hypothesis to be accepted no significant differences should be observed for the interaction effect of MUS status by pre-post treatment.

Secondary Outcome Measures

Secondary measures include the RQ questionnaire, the CATS, and the MEAQ. These measures will allow the exploration of the role of attachment and experiential avoidance in acupuncture therapy.

Previous research by Sochos and Bennett (2016) suggests that attachment style moderates post-treatment outcomes on psychological distress suggesting that those with a greater attachment strategy receive more benefit from acupuncture. This study will first explore this hypothesis using moderation analysis using only those patients that received genuine acupuncture. It is hypothesised that attachment style will moderate post-treatment outcomes on both primary outcomes measures. The moderator effect thresholds for all hypotheses that require moderation analysis, will be reported using the Johnson-Neyman (J-N) technique (Hayes & Matthes, 2009), this will provide a point, on the moderator, where the moderation achieves significance. Attachment strategy (Machin & Dunbar, 2011) and acupuncture (Ma, 2004) have both, separately, been linked to the endogenous opioid system, differences between treatment and placebo moderations may confirm the link between attachment and acupuncture. Therefore, it is predicted that there will be differences between moderation direction or significance on the RQ and CATS when moderating either the GHQ or BSI between placebo and treatment groups.

In order to test the hypothesis that there is a relationship between experiential avoidance and somatic symptoms several Pearson's correlations will be conducted between the total and sub-scales of the MEAQ and both the GHQ-12 and the BSI and its sub-scales.

2.3 STUDY 2

2.3.1 DESIGN

The study was a quasi-experimental design as there was no control group used in this study. Therefore, there was no independent variable, however there was a within subjects' factor of time, i.e. pre- and post-treatment and a between subjects' factor of practitioner. Primary outcomes (dependant variables) were the scores of the GHQ-12 and the BSI; secondary outcomes (co-variants, predictors and/or moderators) were the CATS, MEAQ and the RQ (see Materials for acronym definitions). In addition to these, practitioner measures were used as secondary outcomes for patients, these include the practitioners; demographic, education and length of practice, attachment style (RQ) and experiential avoidance (MEAQ).

2.3.2 PARTICIPANTS

Twenty practitioners were approached, comprising of personal contacts and recommendations of the principal investigator (PI), to take part in the study, out of which ten (50%) agreed to begin collecting data, soon after beginning the data collection a further five clinics ceased to wish to take part as they felt that the questionnaire pack was too intrusive and time consuming. For four out of the five clinics that withdrew, it was their first ever attempt at participating with research and as such may have been slightly overwhelming for them and their patients. Practitioners ages ranged from 35 – 55 (M = 43.96, SD 7.65) and on average they had been in practice for 16.28 years (SD 8.56). They were mostly female (n = 4, 80%) and were all white ethnicity. When asked about their highest qualification, 40% held postgraduate diplomas, 20% held BSc and 40% had a Diploma. All practitioners self-reported suffering from a condition that is considered MUS.

From the five clinics a total of one hundred and eighty-four (N = 184) patients were recruited using opportunity sampling. Participants were recruited via their acupuncture practitioner who asked them to participate in a study investigating the efficacy of acupuncture in the

treatment of somatic symptoms and psychological distress. No restrictions were placed on previous exposure to acupuncture, and besides having to be over the age of 18 there were no other exclusion criteria. In order to maximise the anonymity of both the practitioners and the patients, clinics were arbitrarily numbered one to five. Clinic 1 had a total of 37 completed participants ($n = 37$, 20.1%), clinic 2 provided 43 ($n = 43$, 23.4%), clinic 3 had a total of 26 completed participants ($n = 23$, 14.1%), clinic 4 provided data for 36 participants ($n = 36$, 19.6%) and lastly, clinic 5 had 42 participants ($n = 42$, 22.8%) who completed pre-post measures. The mean age across all participants was 46.63 ($SD = 15.51$) ranging from 18 to 77, with a gender split of 78% in favour of females ($n = 144$; Male $n = 40$, 21.7%). Participants were predominantly of white ethnic origin ($n = 149$, 81%) and presented to the clinics with an existing western diagnosis ($n = 102$, 55.4%). The remainder of the participants' ethnicities were made up of Pakistani ($n = 10$, 5.4%), Black African ($n = 8$, 4.3%), Indian ($n = 6$, 3.3%), Black Caribbean ($n = 4$, 2.2%) and others ($n = 7$, 3.85%). Using the cut off for high somatisers as proposed by Al-sayyad et al. (2010) it was found that 45 participants scored as high somatisers on the BSI ($N=45$, 24.26%). Of the remaining participants, 44 ($N=44$, 23.91%) were considered moderate somatisers and, 95 ($N=95$, 51.63%) were considered low. Compared to study one there were many more participants who fell within both the high and moderate categories, the figures seen in this study are more indicative of what might be expected in primary or secondary care according to Barsky et al. (2005); Brown (2004); Henningsen and Creed (2009); Peveler et al. (1997). Participants presented to the clinics with a variety of complaints that they wished to be treated, the majority of participants ($N = 131$, *71*.2%) indicated that they had been previously diagnosed with a syndrome that could be considered Medically Unexplained. Of those that indicated a MUS diagnosis 42.7% ($n = 56$) had multiple diagnoses. The most prevalent MUS diagnosis indicated by participants was IBS ($n = 25$, 13.6%) closely followed by lower back pain ($n = 23$, 12.5%) (See Table 2.2.2.1).

MUS Diagnosis	Frequency (%)	
IBS	25	(13.6%)
Pelvic Pain	1	(0.5%)
Psychiatric	12	(6.5%)
Lower Back Pain	23	(12.5%)
Tension Headache	1	(0.5%)
Chronic Headaches	1	(0.5%)
Palpitations	2	(1.1%)
Post-viral Fatigue	2	(1.1%)
Insomnia	5	(2.7%)
Repetitive Strain Injury	1	(0.5%)
Pre-menstrual Syndrome	2	(1.1%)
Multiple	56	(30.4%)
None	53	(28.8%)
Total	**184**	

Table 2.2.2.1 – Indicated MUS diagnoses given to participants.

2.3.3 MATERIALS

2.3.3.1 QUESTIONNIARES

Materials used in the study were compiled as a questionnaire pack for each participant that participated in this study. This pack consisted of pre- & post-treatment, paper based questionnaires (See appendix B). These were pre-numbered randomly to ensure anonymity and participants were not required to put their names anywhere on the questionnaire. Clinics were provided with envelopes to securely store completed questionnaires until such time as they could be collected. In addition, a practitioner questionnaire was given to each practitioner that provided treatment to participants during the study (See appendix C). This was completed once per practitioner prior to the commencement of the study.

2.3.3.2 PARTICIPANT QUESTIONNAIRE

The participant questionnaire for this study was identical to study one (see 2.2.3.3 and appendix B). However, no follow-up questionnaire was provided. The pre- and post-questionnaires contained primary outcomes measures (GHQ-12 & BSI) and the RQ and the MEAQ, which were measured at each time-point. The CATS was only obtained post-treatment to capture the relationship that had formed between client and practitioner (in this case acupuncturist) during the treatment sessions.

2.3.3.3 PRACTITIONER QUESTIONNIARE

The practitioner questionnaire was completed prior to the commencement of the trial and consisted of three parts. It was completed once per practitioner and results were duplicated across participants to form the additional predictor and covariate variables for analysis. The first part collected demographic information, including; age, gender, and ethnicity. It also asked practitioners to provide the number of years they had been in practice as well as their acupuncture qualification. Lastly it requested information about previous MUS diagnoses as with participants. The second and third parts of the questionnaire consisted of scales that were also completed by participants, these were the RQ and MEAQ. For the full practitioner questionnaire pack, please see appendix C.

2.3.3.4 ACUPUNCTURE

Clinics that participated in the trial were all single practitioner clinics who all had over five years' practice experience and were qualified to deliver acupuncture. All clinics practiced using the TCM framework as in the first study. Number of needles and session time were not restricted for the purpose of the study; clinicians were asked to practice as they normally would. Following the TCM framework initial consultation consisted of an in-depth consultation with the practitioner to gather patient history, questioning about the main complaint and observations including and tongue diagnosis. Whilst point selection was not recorded by the practitioners due to time constraints, each participant received needling according to their own personalised diagnosis. An additional reason for not recording point selection, or any other clinical information (E.G. Syndrome diagnosis, Pulse or tongue picture) is that the aim of this study was not to identify the points which were most effective in the treatment of MUS or psychological distress but instead to see if the system of medicine as a whole was effective.

2.3.4 PROCEDURE

In order to recruit participants for this study twenty clinics were approached. They were all offered the chance to invite their patients to take part in a piece of research that was investigating the ability of acupuncture to treat psychological and physical distress. It was also explained to the practitioners that additional measures would be taken from them in order to try and explain some of the underlying mechanisms of acupuncture's efficacy. Of the twenty clinics that were approached, ten agreed to participate. On completion of the study five clinics provided complete data that could be used for analysis. When a clinic agreed to participate in the trial an initial meeting took place between the practitioner and the principal investigator. In this meeting the nature and purpose of the study was explained as well as the procedure for collecting data from participants. It was explained to the practitioners that participation of the clinic and individual patients of the clinic was entirely voluntary and either could withdraw at any time. If practitioners agreed to participate they were then asked to complete the practitioner questionnaire (see. 2.3.3.3) which was taken away by the principal investigator. Each clinic was left with one hundred pre-post questionnaire packs and were given instruction on how to ethically ask for patients to participate. This study was approved by the Research Centre for Applied Psychology ethics committee (See Appendix E).

New patients of the clinic were asked by their practitioner to participate in a study that was investigating the efficacy of acupuncture in the treatment of psychological and physical distress. Patients, whilst they had to be attending for a new course of treatment, did not have to be naïve to acupuncture treatment and no restriction was placed on the last time they had treatment. This restriction was only present in study 1 to avoid the slim chance of un-blinding participants. They were informed that agreeing, declining or subsequently withdrawing from participation would have no impact on their treatment what so ever. It was explained that a

questionnaire would have to be completed on their initial appointment and after 5 acupuncture sessions, however, there was no obligation to have 5 acupuncture sessions should the participant choose not to. Participants were made aware that the study was being conducted by researchers at the University of Bedfordshire's Psychology department and that, on completion, their data would be anonymously transferred to them for analysis. If the patient agreed to participate they were then asked to complete the pre-treatment questionnaire which included an informed consent form which was signed. On completion of the pre-treatment questionnaire it was put in an envelope and stored securely until such time that the principal investigator could collect them. The participant then began their treatment as normal and continued as they would, I.E. they may have had one treatment per week or one per fortnight, the frequency of treatments was advised by the practitioner but is ultimately the participants decision. Due to time restraints and not wanting to overwhelm practitioners, frequency of treatment sessions was no recorded, the recording of this information is not always beneficial as treatment frequency can fluctuate with participants' personal circumstances.

Once the participant had completed five treatments they were asked to complete the post-treatment questionnaire. For many participants this may not have been their last treatment for the main complaints that they were visiting for, however, for the purposes of this study, a total of five treatments was determined to be the cut-off in order to match study one (see 2.4.1.2). Once the post-treatment questionnaire was completed it was stored securely with the other participants' questionnaires and awaited collection by the principal investigator. Participants were then thanked by their practitioner for their participation and reminded of the contact information of the principal investigator at the University of Bedfordshire should they wish to make contact for any reason. They were also told that their treatment at the clinic could continue and would be entirely unaffected be their participation in the trial.

2.3.4.1 STATISTICAL ANALYSIS

All statistical analyses were undertaken using SPSS 21 (unless otherwise stated), data was entered from hard copies of questionnaires. Each participant had their practitioner's questionnaire responses added to form additional variables. These variables would be the same for each participant that participated at a particular clinic. This section will address the analyses relating to each hypothesis of the study beginning with the primary outcome measures.

Primary Outcome Measures

The primary objective of study two was to validate the findings of study one, in that acupuncture will significantly reduce psychological and physical distress (GHQ and BSI respectively) in an ecologically valid setting. To test this hypothesis, a repeated measures multivariate analysis of variance (MANOVAs) will be conducted. Correlations of the two DVs suggest a relationship that warrants investigation with a MANOVA (Field, 2013), doing so will increase statistical detection power beyond that of two separate ANOVAs and reduce the risk of a type one error. The repeated factor for this test will be the pre-post treatment time points. Primary outcomes (DVs) are the BSI and GHQ-12. A further MANOVA will be conducted using only the sub-scales of the BSI in order to explore the effects on specific clusters of somatic symptoms. It is predicted that on all sub-scales the reduction will be significant pre- to post-treatment.

In order to test for differences between practitioners a 2x5 factorial MANOVA will be conducted where pre-post GHQ and BSI measures are the repeated measures factor and the between participant factor is the clinic they attended. Lastly in order to test for differences between those who were diagnoses as suffering with MUS and those who were not a final 2x2 MANOVA will be conducted. The repeated measures factor will be pre-post treatment on the GHQ and BSI and the between subjects' factor is the presence of an MUS diagnosis or not.

Secondary Outcome Measures

Secondary measures include the RQ, CATS and MEAQ. These measures will allow the exploration of the role of attachment and experiential avoidance in acupuncture therapy.

In order to test all hypotheses pertaining to secondary outcomes a series of moderation analyses will be conducted. In all instances in where hypotheses achieve statistical significance, further statistical probing will be conducted and reported using the Johnson-Neyman (J-N) technique (Hayes & Matthes, 2009), this will provide a point, on the moderator continuum, where the moderator begins significantly moderating the DV.

CHAPTER 3 – STUDY 1

PSYCHOLOGICAL DISTRESS, SOMATIC SYMPTOMS AND THE ROLE OF ATTACHMENT IN ACUPUNCTURE

A DOUBLE-BLIND RANDOMISED CONTROL TRIAL

3.1 AIMS/HYPOTHESES/RATIONAL

This study aims to investigate the effectiveness of acupuncture in the treatment of psychological distress and somatic symptoms , whilst exploring the involvement attachment and experiential avoidance in the clinical setting. Due to an absence of previous, rigorous empirical evidence, the gold standard in clinical trial methodologies, a double-blind randomised control trial, was used to ensure that effects of extraneous variables were reduced and the true effect of acupuncture could be observed. A deeper understanding of the effectiveness of acupuncture for psychological and somatic distress and MUS will help inform practitioners of acupuncture and inform local NHS policy about referral to these services. An understanding of the psychological mechanisms that are active during acupuncture therapy and between practitioner and therapist could help with further developing training provided to practitioners, but may also provide valuable insight for other healthcare professionals and may inform their practice.

It is hypothesised that participants receiving genuine acupuncture treatment will show greater post-treatment reductions on primary outcome measures (see 2.3.1) when compared to the placebo acupuncture group. Also, it is hypothesised that, at follow up this difference between groups will be maintained. It is predicted that those with medically unexplained symptoms will receive an equal therapeutic effect when compared to those with explained symptoms. The endogenous opioid theory which has implications in the attachment system and acupuncture (see Chap. 1.2 and 1.3), suggests that there will be a difference between placebo and treatment groups in the moderation of attachment style only on the BSI and not on the GHQ (Sochos & Bennett, 2016). It is hypothesised that a moderation effect will be observed in the treatment groups but not in the placebo group. In support of the link between experiential avoidance and somatic symptoms, it is predicted that there will be a significant positive correlation between those who are high on the sub-scales of experiential avoidance and both psychological distress (GHQ-12) and somatic symptoms (BSI) pre-treatment. Like attachment there may be reason to believe that experiential avoidance may moderate

treatment outcomes. Therefore, it is hypothesised that the MEAQ will moderate post-treatment outcomes on both the GHQ-12 and BSI for the treatment group. In addition, it is expected that there will be a difference in the moderation effects of the MEAQ between the treatment and placebo groups. Lastly, it is predicted that the attachment that the client develops to the acupuncturist during the treatment will moderate post-treatment effects on both the GHQ-12 and BSI. As with previous hypotheses, the implication of endogenous opioids in both the attachment system and acupuncture, suggests that there should be a difference between the moderation effects between treatment and placebo groups.

3.2 RESULTS OF PRIMARY OUTCOMES

The descriptive statistics of the primary outcome measures suggest that there may be a reduction in symptoms irrespective of treatment group. Pre-treatment means of placebo and treatment group appear similar with means of 13.20 (*SD* 5.57) and 13.05 (*SD* 5.60) for GHQ and 24.65 (*SD* 20.65) and 25.72 (*SD* 17.30) for the BSI respectively. Post-treatment means for the GHQ suggest an average reduction of 2.25 points for the placebo group and 8.05 for treatment, suggesting greater efficacy for the genuine acupuncture group. This same effect is observed on the BSI with the placebo group having an average reduction of 2.45 and the treatment group showing an average reduction of 16.17. Follow up scores on the GHQ suggest a small increase in symptoms from post-treatment in the placebo group (*M* = 12.38, *SD* = 5.07) and the treatment group (*M* = 5.41, *SD* = 2.96). Scores for the BSI are different with a reduction between post follow being observed in the placebo group (*M* = 19.46, *SD* = 21.54) but a slight increase in the genuine acupuncture group (*M* = 11.38, *SD* = 9.86) (See Table 3.1.1).

A 2x2 Multivariate Analysis of Variance (MANOVA) was conducted in order to establish if the acupuncture group showed a greater reduction in symptoms compared to the placebo group. Box's test of equality of covariance matrices suggested that no transformation of the D.V. was required (*p* = .01). Results showed no significant multivariate main effect of trial group

(p = .06), suggesting that overall (irrespective of time point) there were no significant differences between placebo and treatment groups. This is expected as the randomisation process (see. 2.2.4.1) should have ensured that both pre-treatment groups were similar in terms of both GHQ-12 and BSI scores. The main multivariate effect of time point (irrespective of treatment group) was significant [F (2, 60) = 45.67, $p < .001$; Wilk's Λ = .40, partial η^2 = .60], observed power for this effect was high. The multivariate interaction effect of time point and trial group was also significant [F (2, 60) = 18.35, $p < .001$; Wilk's Λ = .32, partial η^2 = .38], given the significance of the both the main effect of time point and the interaction effect of time point and trial group, univariate interaction effects were examined for the two DVs. A significant interaction between time point and trial group was observed on the GHQ-12 [$F(1, 61)$ = 33.91, $p < .001$; partial η^2 = .36] and the BSI [$F(1, 61)$ = 13.94, $p < .001$; partial η^2 = .19] suggesting that the acupuncture group saw significantly greater improvement than the placebo group (See Fig. 3.1.2 & 3.1.3).

	Placebo Group (*N*=20)		Genuine Group (*N*=22)	
Age, *M*(*SD*)	37.60	(11.95)	36.64	(12.52)
Female gender, N (%)	15	(75)	17	(77)
Pre-Treatment GHQ, *M*(*SD*)	13.20	(5.57)	13.05	(5.60)
Post-Treatment GHQ, *M*(*SD*)	10.95	(4.51)	5.00	(3.73)
Follow-up GHQ, *M*(*SD*)	12.38	(5.07)	5.41	(2.96)
Pre-Treatment BSI, *M*(*SD*)	24.65	(20.65)	25.72	(17.30)
Post-Treatment BSI, *M*(*SD*)	22.20	(18.39)	9.55	(6.06)
Follow-up BSI, *M*(*SD*)	19.46	(21.54)	11.38	(9.86)
MUS Diagnoses: *N*(%)				
IBS	1	(5)	3	(13.6)
Pelvic Pain	1	(5)	0	(0)
Psychiatric	1	(5)	3	(13.6)
Lower Back Pain	4	(20)	2	(9.1)
Tension Headache	0	(0)	1	(4.5)
Pre-menstrual Syndrome	0	(0)	1	(4.5)
Palpitations	1	(5)	0	(0)
Repetitive Strain Injury	1	(5)	0	(0)
Multiple Diagnoses	6	(30)	4	(18.2)
None	5	(25)	8	(36.4)
Total	20		22	

Table 3.1.1 Means between placebo and treatment groups
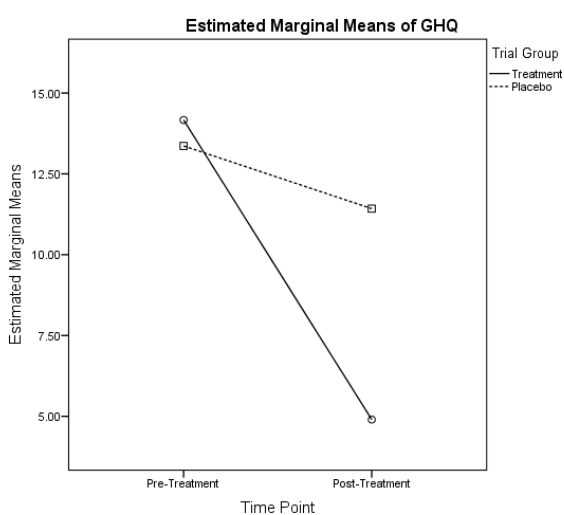
Figure 3.1.2
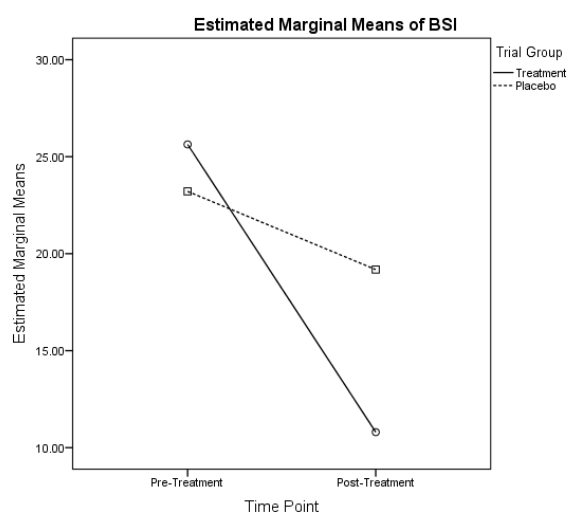
Figure 3.1.3

Figure 3.1.2 & 3.1.3 show the interaction effect between trial group and time point for both GHQ and BSI respectively. In both instances the post treatment drop in the treatment group was significantly higher than in placebo group. The use of a MANOVA for this analysis has reduced the chances of an inflated type 1 error rate that would be present if the analysis was undertaken using two separate ANOVAs (Field, 2013). In order to explore the effects of acupuncture on specific clusters of symptoms a separate MANOVA was conducted using the sub-scales of the BSI (Head, Chest, Abdomen, Fatigue, Heat, Globus Hystericus, Frequency and Panic), this would determine if acupuncture was successful at treating a range of somatic symptoms or if there was a focus on particular clusters of symptoms. Box's test of equality of covariance matrices showed a breach [F(136, 11270.82) = 2.595, $p < .001$] therefore the more conservative Pillai's Trace will be reported. Once again, the overall main effect of trial group [$F_{(8, 54)}$ = 2.71, $p = .01$; Pillai's Trace = .29, partial η^2 = .29] and time point [$F_{(8, 54)}$ = 2.71, $p < .001$; Pillai's Trace = .45, partial η^2 = .45] were significant in addition to this, the interaction between the two factors was also significant [$F_{(8, 54)}$ = 2.71, $p = .02$; Pillai's Trace = .27, partial η^2 = .27]. Univariate tests on the individual sub-scales revealed that the main effect of time point was significant for all but two sub-scales, suggesting that there was no significant difference in scores pre-post-treatment (irrespective of trial group) for somatic chest ($p = .11$) and heat related symptoms ($p = .24$). The main effect of trial group (irrespective of time point) was not significant for any of the sub-scales of the BSI. However, five of the eight sub-scales were significant (see Table 3.1.4) for the effect of the interaction, suggesting significant differences between trial groups and time points.

Source	Measure	df	df Error	F	Sig.	Partial η^2	Observed Power[a]
Time Point	BSI Head	1	61	7.14	.01	.11	.749
	BSI Chest	1	61	2.70	.11	.04	.366
	BSI Abdomen	1	61	18.40	<.001	.23	.988
	BSI Fatigue	1	61	41.88	<.001	.41	1.000
	BSI Heat	1	61	1.43	.24	.02	.218
	BSI Globus	1	61	5.61	.02	.08	.644
	BSI Frequency	1	61	11.88	.001	.16	.924
	BSI Panic	1	61	7.33	.01	.11	.760
Trial Group	BSI Head	1	61	.43	.52	.01	.10
	BSI Chest	1	61	.29	.59	.01	.08
	BSI Abdomen	1	61	.02	.90	<.001	.05
	BSI Fatigue	1	61	3.49	.07	.05	.45
	BSI Heat	1	61	2.19	.14	.04	.31
	BSI Globus	1	61	2.83	.10	.04	.38
	BSI Frequency	1	61	.27	.61	.004	.08
	BSI Panic	1	61	.76	.76	.002	.06
Time Point * Trial Group	BSI Head	1	61	1.79	.19	.03	.26
	BSI Chest	1	61	6.33	.01	.09	.70
	BSI Abdomen	1	61	6.97	.01	.10	.74
	BSI Fatigue	1	61	8.77	.004	.13	.83
	BSI Heat	1	61	1.06	.31	.02	.17
	BSI Globus	1	61	9.03	.004	.13	.84
	BSI Frequency	1	61	6.69	.01	.10	.72
	BSI Panic	1	61	.63	.43	.01	.12

[a] Computed using alpha = .05

Table 3.1.4 Univariate Results for BSI Sub-Scale MANOVA

As seen in figure 3.1.6 & 3.1.7, which are two examples of significant interaction terms, those in treatment group fared better if they were suffering with Fatigue and/or Chest related somatic symptoms. Symptoms related to the chest on average became worse between pre- and post-treatment in the placebo group. The treatment group saw an average reduction in symptoms across all subscales, whereas the placebo group saw an average increase on two subscales (See Table 3.1.5). It is important to note that some of the pre-post mean differences were less than one which, despite being significant (e.g. BSI Chest) may not be clinically relevant. Abdominal and fatigue related symptoms groups have good statistical power (partial η^2 = .10 & .13 respectively) and pre-post means suggest a relevant clinical effect.

Measure	Treatment Mean		Placebo Mean	
	Pre	Post	Pre	Post
BSI Head	2.57	1.20	2.58	2.12
BSI Chest	1.13	.27	.82	1.00
BSI Abdomen	5.07	2.27	8.27	3.30
BSI Fatigue	8.27	3.30	9.06	7.21
BSI Heat	.83	.43	1.12	1.09
BSI Globus	1.30	.53	.36	.45
BSI Frequency	2.97	1.27	1.94	1.70
BSI Panic	1.00	.50	.82	.55

Table 3.1.5 Means of BSI Sub-scales pre- and post-treatment, placebo vs. treatment
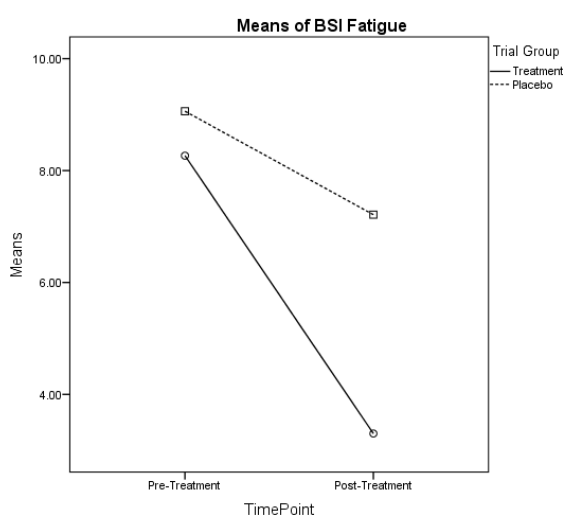
Figure 3.1.6
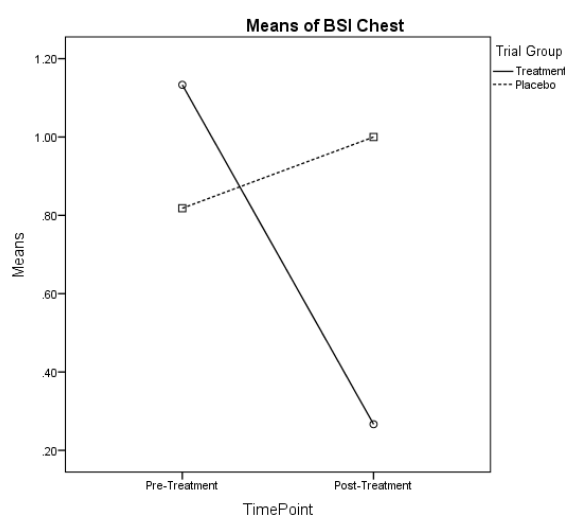
Figure 3.1.7

In order to test the maintenance effect of acupuncture compared to placebo a further 2x2 MANOVA was undertaken. Means from the DVs suggested very little change in GHQ between post-treatment ($M = 7.96$, $SD = 5.06$) and follow up ($M = 9.04$, $SD = 5.44$), this was equally true of the mean between post-treatment ($M = 15.50$, $SD = 14.61$) and follow up ($M = 15.80$, $SD = 17.53$) on the BSI. Box's test of equality of covariance matrices was significant [F(10, 9085.47), $p < .001$] indicating that the variance between the DVs were unequal, which they were due to the drop-out rate between post-treatment and follow up. Pillai's trace was used as a correction for the significant Box's plot as variance is similar between post-treatment and follow up on both DVs, variance for GHQ is greater for post-treatment and as

there are more cases this will result in a conservative significance value. However, for BSI the variance is higher in the follow up data, which has the least number of cases, which may be indicative of a more liberal significance value being computed and therefore marginal significances should be treated with caution (Tabachnick & Fidell, 2001). The main multivariate effect of trial group was significant [$F(2, 43) = 16.39$, $p < .001$; Pillai's Trace = .43, partial $\eta^2 = .43$]. There was a significant effect of time point, suggesting significant differences between post-treatment and follow up on both measures [$F(2, 43) = 4.76$, $p = .01$; Pillai's Trace = .18, partial $\eta^2 = .18$]. The interaction between time point and trial group was not significant ($p = .18$) indicating that there was no significant change in symptoms in either group at either time point. Univariate statistics relating to the interaction term will be ignored, due to a non-significant effect.
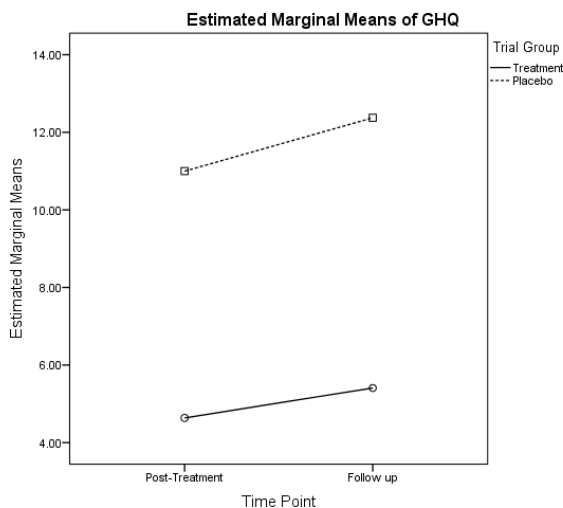
Figure 3.1.7
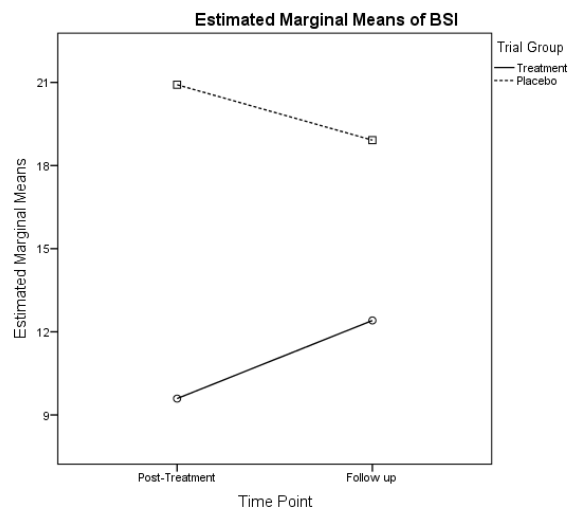
Figure 3.1.8

The univariate main effect of time point was significant for the GHQ [$F(1, 44) = 9.57$, $p = .003$; partial $\eta^2 = .179$] but not for the BSI ($p = .77$), this suggests that across all participants there was a significant increase in GHQ scores and no significant change in symptoms. Tests of between-subjects effects revealed that there were significant differences between trial groups across the time points on both the GHQ [$F(1, 44) = 33.53$, $p < .001$; partial $\eta^2 = .43$] and the BSI [$F(1, 44) = 4.12$, $p = .049$; partial $\eta^2 = .09$]. These differences can be seen

in figure 3.1.7 & 3.1.8, where the treatment group for both the GHQ and BSI measures is significantly lower than the placebo group.

A further 2x2 MANOVA was conducted to explore the differences between post & follow-up on the BSI subscales. The main effects of trial group and time point were non-significant (p =.07; p = .62 respectively) the interaction term was also not significant (p = .21). This result implies that there is no difference between placebo and treatment groups or post-treatment and follow-up time points.

In order to test if there were differences in treatment efficacy between those with and those without a MUS diagnosis across placebo and treatment groups a 2x2x2 MANOVA was conducted. Classification of patients with MUS was based on self-report of at least one functional syndrome diagnosis. Results showed that there was no significant interaction between MUS status and trial group (p = .74) or time point (p = .928). There was also no significant three-way interaction between MUS status, time point and trial group (p = .34). Equally there was no main effect of MUS status (p = .24). This result was maintained between post-treatment and follow up time points with no significant main effect of MUS status (p = .06), interactions between MUS status and time point (p = .32) or trial group (p = .26) or three-way interaction between MUS status time point and trial group (p = .92). These results are suggestive of no treatment bias between MUS and non-MUS patients in treatment, placebo or follow up stages.

3.2 RESULTS OF SECONDARY OUTCOMES

Secondary outcomes are those which relate to attachment and experiential avoidance, namely the RQ, CATS and MEAQ. Firstly, it is expected that attachment style should not change between pre- and post-treatment time points, however a repeated measure MANOVA showed a significant main effect of time point (pre-post) [$F(4, 59) = 5.20$, $p = .001$; partial $\eta^2 = .26$]. Univariate tests uncover that between pre- and post-treatment secure attachment significantly increased [$F(1, 62) = 10.31$, $p = .002$; partial $\eta^2 = .14$], fearful attachment significantly decreased [$F(1, 62) = 5.37$, $p = .02$; partial $\eta^2 = .08$], dismissive attachment significantly increased [$F(1, 62) = 4.96$, $p = .04$; partial $\eta^2 = .07$] and preoccupied attachment did not significantly change ($p = .72$). A 2x2 MANOVA revealed that these differences were not due to the differences between placebo and genuine treatment ($p = .55$), despite the significant findings, confidence intervals reveal that differences between pre- and post on all attachment styles are never more than 1.5 points on the 7-point scale. In the context of the RQ this would represent a very minor, if any, change in attachment strategy.

3.2.1 MODERATIONS – ATTACHMENT, GHQ & BSI

To test the hypothesis that attachment strategy moderates the post-treatment outcomes of both the BSI and GHQ, several moderation analyses were undertaken. Each of the four questions from the RQ (each corresponding to a particular attachment style) were used as moderators whilst the remaining three questions were added to the model as additional predictors in order to control for their effect in the model, age and gender were also controlled for in the model. For the two primary outcomes, four RQ questions and placebo and treatment groups, a total of 32 moderations were conducted. The first moderation was of the treatment group on GHQ using the secure attachment question as the moderator. No significant moderation model existed ($p = .48$) which suggests that attachment security does not moderate post-treatment outcomes in the genuine acupuncture group. However, in the placebo group secure attachment the overall model for the moderation was significant [$F(8,$

24) = 7.12, $p < .001$], explaining 70% ($R^2=.70$) of the total variance in post-treatment GHQ scores. The interaction term of the moderation did not achieve significance, but was borderline [$t(24) = 2.02$, $p = .06$, $\beta = 1.43$] suggesting that attachment security did not moderate post-treatment outcomes on the GHQ in the placebo group. This result pattern was identical for the other three attachment styles; the overall model was significant for the placebo group for Fearful [$F(8, 24) = 5.70$, $p < .001$], Preoccupied [$F(8, 24) = 5.96$, $p < .001$] and Dismissive [$F(8, 24) = 6.54$, $p < .001$] questions on the RQ, with all interaction terms being non-significant ($p = .73$, $p = .36$, $p = .13$, respectively) but overall models were non-significant in the treatment group. These results suggest that there is no moderation effect of attachment style on post-treatment outcomes on the GHQ, however they also suggest that there is a difference between how attachment strategies impact as models in the placebo group were all significant and were non-significant in the treatment group.

In the case of attachment strategy moderating the post-treatment outcomes on the BSI numerous moderations were once again undertaken first investigating the total BSI score and then using the sub-scales of the BSI. Analysis was again divided between placebo and treatment groups, in order to observe differences between moderations effects, age and gender were added to the model to control for their effects. For attachment security moderating the post-treatment outcomes on the BSI the overall model was significant [$F(8, 21) = 13.17$, $p < .001$], the model explains 83.39% ($R^2 = .83$) of the variance in post BSI scores. The moderation interaction was also significant [$t(21) = 3.77$, $p = .001$; $\beta = -.13$] suggesting that attachment security moderates post-treatment outcomes on the BSI in the treatment group. This is illustrated in Fig. 3.2.1.1 where it can be seen that treatment efficacy depended on the level of secure attachment, those who provided a higher secure attachment score fared better in treatment.
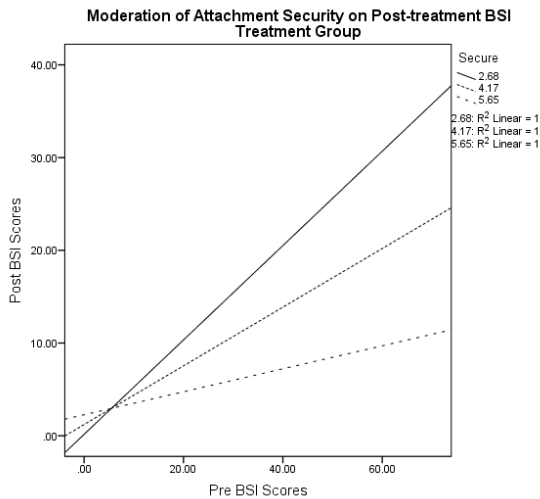
Figure 3.2.1.1
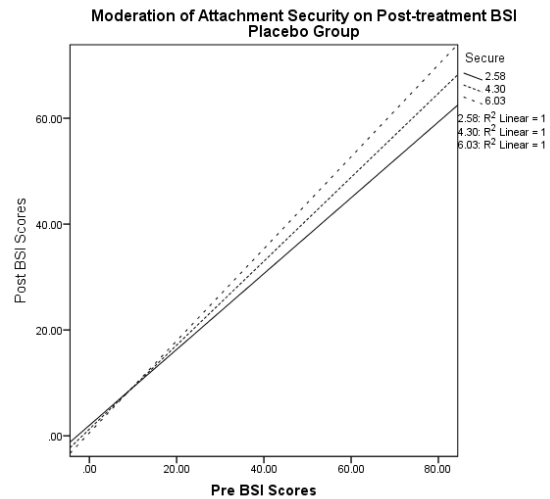
Figure 3.2.1.2

The Johnson-Neyman (J-N) technique (Hayes & Matthes, 2009) was applied post-hoc in order to explore the threshold at which the moderator began significantly impacting the relationship between pre- and post BSI measures. Results of this correction show that the upper limit of the moderator at the significance threshold of 95% was 5.19 suggesting that all scores lower than this on the secure attachment question of the RQ would moderate the BSI outcome in the treatment group [$t(21) = 2.08$, $p = .05$; β = .18]. Interestingly when conducting the same analysis using the placebo group a significant model was present [$F(8, 24) = 10.65$, $p < .001$] explaining 78% ($R^2 = .78$) of the variance in post-treatment BSI scores. However, the moderation interaction term was not a significant predictor ($p = .53$) suggesting that attachment security did not moderate BSI outcome in the placebo group. Fig. 3.2.1.2 shows the direction of the relationship, it was found that those who were higher in attachment security fared worse in treatment if receiving placebo treatment, it is important to note that although the overall model is significant, the moderation non-significant and therefore it cannot be stated that this effect is present.

Fearful attachment in the treatment group showed a significant overall model for the moderation analysis [$F(8, 21) = 6.91$, $p < .001$] explaining 72% of the variance in the post-treatment BSI scores ($R^2 = .72$). However, the moderation interaction term was not a significant predictor of the model ($p = .64$). Indicating that, scores for the fearful attachment

question, on the RQ, do not moderate the post-treatment outcomes on the BSI. This same result was found for the placebo group with a significant overall model [$F_{(8, 24)}$ = 10.61, p <.001] explaining 78% of the variance in the post-treatment BSI scores (R^2 = .78) but a non-significant moderator (p = .56). This same pattern of results was also observed in the treatment and placebo group when using the preoccupied question from the RQ. In the treatment group the overall model was significant [$F_{(8, 21)}$ = 6.94, p <.001] explaining 73% of the variance in the post-treatment BSI (R^2 = .73), the moderation interaction term was not significant (p = .59). The placebo group, using the same preoccupied attachment question form the RQ, displayed the same pattern, the overall model was significant [$F_{(8, 24)}$ = 12.53, p <.001] explaining 81% of the variance in the post-treatment BSI (R^2 = .81). The moderation interaction term was non-significant, suggesting that no moderation effect was present (p = .06). Due to the borderline result that was present a power calculation was undertaken to calculate the required sample size to eliminate any chance of a type 2 error (accepting the null hypothesis erroneously), based on the effect size of f^2 = 4.18 and alpha of .05, a power of .95 and 8 predictors the required sample size calculated was 12. This indicates that the result achieved is free of type 2 error.

Next, the moderation effects of dismissive attachment were investigated. Once again for the treatment group the same pattern was observed where the overall model was significant [$F_{(8, 21)}$ = 6.96, p < .001] explaining 73% of the total variance in the post-treatment BSI score (R^2 = .73). However, the moderation interaction term was non-significant (p = .57) suggesting that in the treatment group, dismissive attachment does not moderate the post-treatment outcomes on the BSI. In contrast the placebo group had an overall significant model [$F_{(8, 24)}$ = 13.09, p < .001] explaining 81% of the variance in the post-treatment BSI (R^2 = .81) for the placebo group. In addition to this, the dismissive attachment style significantly moderated the BSI's post-treatment outcome [$t_{(24)}$ = -2.19, p =.04; β = -.11]. As can be seen in Fig. 3.2.1.3 those who were higher in the dismissive attachment style fared better in treatment compared to those who were lower. The J-N technique was applied post-

hoc to discover the threshold at which the moderator became significant and discovered that the entire continuum (1-7 Likert scale see Chap. 2.3.1.4) of the moderator was significant [$t(24) = 3.71$, $p = .001$; $\beta = .53$].
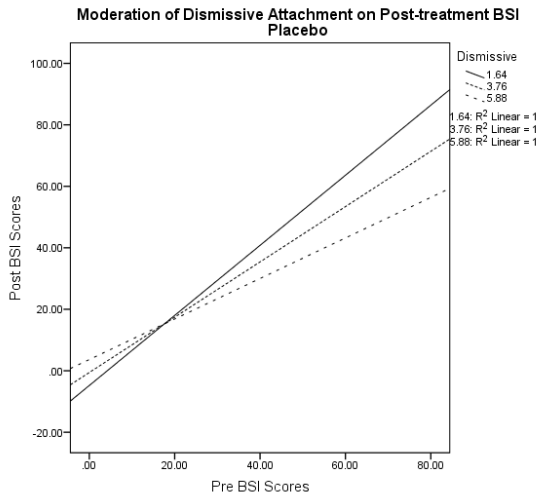
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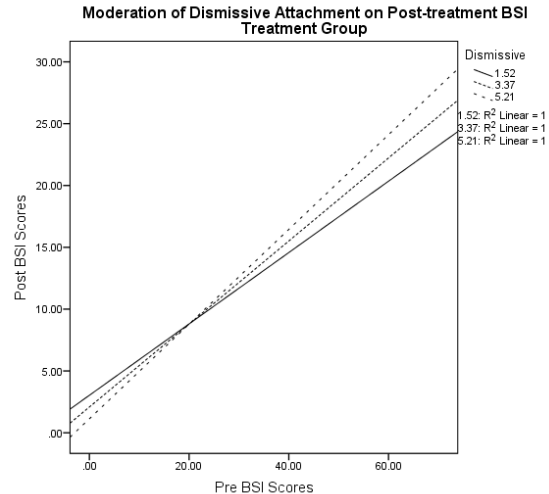
Figure 3.2.1.4

Interestingly, despite the moderation not being significant for the treatment group it can be observed that where higher levels of dismissive attachment result in better treatment outcomes in the placebo group, the opposite is true with the treatment group. Higher dismissive attachment resulted in a non-significant reduction in treatment efficacy in the treatment group.

Further exploration of the subscales of the BSI using moderation analysis could determine if the effects seen in the total BSI are the result of the moderations only being present in one symptom cluster (e.g. only head related symptoms). Equally, moderations of subscales may be significant for attachment styles that were non-significant for the total BSI as a result of certain clusters of symptoms being affected by the attachment system. To explore this 64 separate moderation analyses were undertaken and the results of these can be seen in Table 3.2.5. Of the moderations 56 had significant overall models but only 15 of these showed significant results for the moderation terms in the model, six in the treatment group and nine in the treatment group. Only the frequency sub-scale of the BSI has significant moderations for both placebo and treatment groups when secure attachment is the

moderator. There are differences in the significances of overall models between treatment and placebo groups for the heat and panic subscales; all placebo attachment styles were non-significant and all treatment group attachment styles were significant in both instances.

Moderator	Outcome Scales	Treatment		Placebo	
		F	p	F	p
Secure	BSI/Head	5.39	<.001	4.32	.002
Fearful	BSI/Head	2.46	.05	4.49	.002
Preoccupied	BSI/Head	2.82	.03	5.88	<.001*
Dismissing	BSI/Head	2.47	.05	7.33	<.001*
Secure	BSI/Chest	3.86	.01*	5.16	<.001
Fearful	BSI/Chest	2.62	.04	6.76	<.001*
Preoccupied	BSI/Chest	2.95	.02	10.09	<.001*
Dismissing	BSI/Chest	2.97	.02	7.60	<.001*
Secure	BSI/Abdomen	7.29	<.001	10.55	<.001
Fearful	BSI/Abdomen	6.15	<.001	9.75	<.001
Preoccupied	BSI/Abdomen	6.08	<.001	10.58	<.001
Dismissing	BSI/Abdomen	6.04	<.001	9.57	<.001
Secure	BSI/Fatigue	10.13	<.001*	6.23	<.001
Fearful	BSI/Fatigue	6.29	<.001	5.47	<.001
Preoccupied	BSI/Fatigue	6.60	<.001	5.65	<.001
Dismissing	BSI/Fatigue	6.26	<.001	6.94	<.001*
Secure	BSI/Heat	9.32	<.001*	1.29	.29
Fearful	BSI/Heat	3.93	.01	1.89	.11
Preoccupied	BSI/Heat	4.57	.002	2.24	.06
Dismissing	BSI/Heat	4.03	.01	1.22	.33
Secure	BSI/Globus	7.31	<.001*	4.59	.002
Fearful	BSI/Globus	4.51	.003	5.06	.001
Preoccupied	BSI/Globus	4.44	.003	5.56	.001
Dismissing	BSI/Globus	8.09	<.001*	4.59	.002
Secure	BSI/Frequency	6.86	<.001*	6.20	<.001*
Fearful	BSI/Frequency	4.44	.003	6.67	<.001*
Preoccupied	BSI/Frequency	4.63	.002	8.22	<.001*
Dismissing	BSI/Frequency	4.39	.003	4.85	.001
Secure	BSI/Panic	3.43	.01	1.62	.17
Fearful	BSI/Panic	3.52	.01	1.28	.30
Preoccupied	BSI/Panic	3.46	.01	1.39	.25
Dismissing	BSI/Panic	3.89	.006	1.53	.20

* = Significant moderation term in model.

Table 3.2.1.5 – Moderations of Attachment Styles and BSI Sub-Scales

3.2.2 MODERATIONS – CATS, GHQ & BSI

The client attachment to therapist scale (CATS) measures the relationship that the client has to the therapist and gauges how secure, avoidant or preoccupied the relationship is from the clients' perspective. It is hypothesised that much like the RQ which measures general attachment strategy, a more secure client attachment to therapist would result in higher treatment efficacy in the treatment group. It is expected that there will be no significant

moderations for the placebo groups. In the moderation analysis, age and gender will be controlled for, as well as the other CATS sub-scales to control for their effect.

For the treatment group the secure CATS sub-scale did no moderate the post-treatment outcomes on the GHQ ($p = .28$). However, for the placebo group, a significant overall model was observed [$F(7, 24) = 10.19$, $p < .001$] which explained 75% of the variance in the post-treatment GHQ scores ($R^2 = .75$), in addition the interaction term was also significant [$t(24) = 2.20$, $p = .04$; $\beta = .02$]. As can be seen in Figure 3.2.2.1, higher attachment security resulted in lower treatment efficacy in the placebo group. The J-N technique revealed that the moderation effect was only present with Secure CATS scores above 40.49 [$t(24) = 2.06$, $p = .05$; $\beta = .37$]. A similar pattern of results was observed with the BSI, the treatment group had a significant overall model with the Secure CATS sub-scale [$F(7, 22) = 8.00$, $p < .001$] explaining 72% of the variance ($R^2 = .72$), however, the moderation interaction term was not significant. With the placebo group there was a significant overall model [$F(7, 24) = 18.10$, $p < .001$] explaining 84% of the variance ($R^2 = .84$). The moderation interaction term was also significant [$t(24) = 3.49$, $p = .002$; $\beta = .04$] as with the GHQ, participants with higher scores fared worse in treatment (See Fig. 3.2.2.2). The J-N technique showed that scores on the Secure CATS of over 41.86 [$t(24) = 2.60$, $p = .05$; $\beta = .30$] would result in a significant moderation of post-treatment BSI.
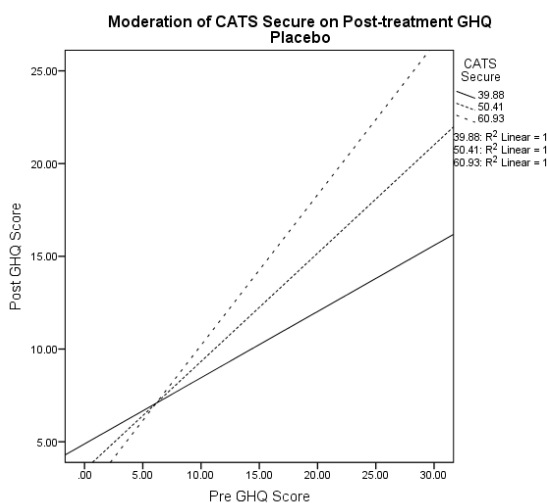
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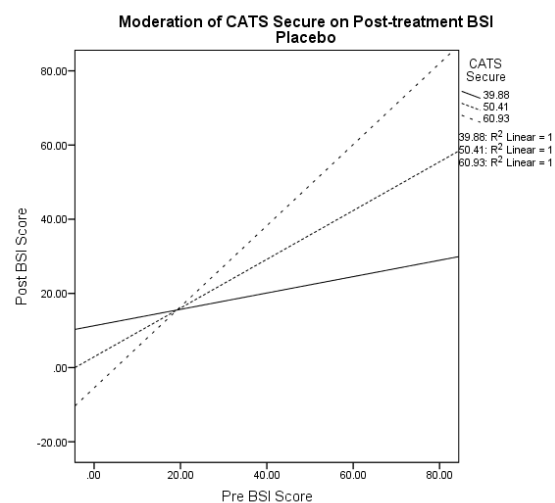
Figure 3.2.2.2

For the avoidant CATS sub-scale, there was no moderation in the treatment group on the GHQ ($p = .35$), however, a power analysis showed that this result is underpowered and potentially subject to type 2 error and a sample size of 62 would be required. For the placebo group, despite a significant overall model [$F(7, 24) = 8.08$, $p < .001$], the model explains 70% of the variance ($R^2 = .70$), the moderation interaction term was not significant ($p = .77$). The model for avoidant CATS, in the treatment group and BSI was significant [$F(7, 22) = 9.40$, $p < .001$], it explains 75% of the variance in the post-treatment BSI, the moderation interaction term was also significant [$t(22) = 2.49$, $p = .02$; $\beta = .04$]. As can be seen in Fig. 3.2.2.3 those with higher avoidant attachment fared worse in treatment. The J-N technique showed that an avoidant attachment score of over 20.74 [$t(22) = 2.07$, $p = .05$; $\beta = .21$] would result in a significant moderation in post-treatment BSI scores, in the treatment group. For the placebo group with avoidant attachment as the moderator on the BSI, a significant model was observed [$F(7, 24) = 10.91$, $p < .001$] which explained 76% of the variance ($R^2 = .76$). The moderation interaction term, however, was not significant ($p = .77$).

Lastly the preoccupied CATS sub-scale was tested first for the treatment group on the GHQ, preoccupied attachment did not moderate the outcome of the GHQ ($p = .51$). For the placebo group, despite a significant overall model [$F(7, 24) = 8.16$, $p < .001$] which explains 70% of the variance in post-treatment GHQ ($R^2 = .70$), there was no significant moderation interaction term. The BSI for the treatment group showed a significant overall model [$F(7,22) = 6.65$, $p < .001$] which explains 68% of the variance ($R^2 = .68$), however, there was no significant moderation effect. Analysis revealed a significant overall model for the placebo group [$F(7, 24) = 13.87$, $p < .001$] explaining 80% of the variance in post-treatment BSI scores ($R^2 = .80$). The interaction term was also significant [$t(24) = 2.25$, $p = .03$; $\beta = .02$], as can be seen in Fig. 3.2.2.4 higher scores on the preoccupied subscale of the CATS resulted in worse post-treatment outcomes on the BSI. The J-N technique revealed that scores above 7.93 [$t(24) = 2.06$, $p = .05$; $\beta = .38$] would cause a significant moderation effect limiting placebo efficacy.
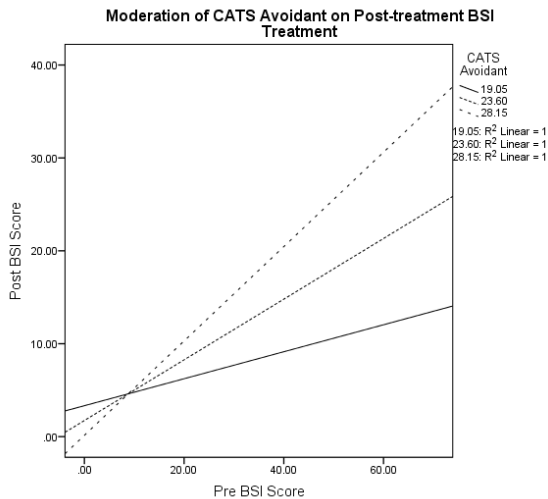
Figure 3.2.2.3
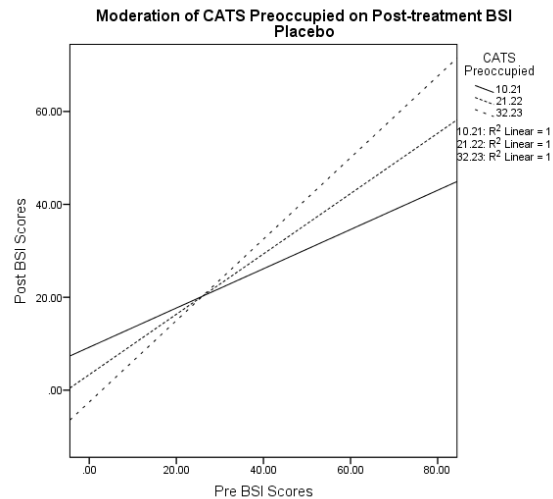
Figure 3.2.2.4

3.2.3 CORRELATIONS – MEAQ, GHQ & BSI

It is expected that experiential avoidance will positively correlate with both psychological distress and presentation of somatic symptoms. In order to test this, a Pearson's correlation will be carried out using the total and subscales of the MEAQ, the GHQ-12 and the total and subscales of the BSI. Both GHQ [r = .24, N = 62 p = .03] and BSI [r = .30, N = 62, p = .01] totals correlate positively with total MEAQ scores suggesting that there is a positive relationship between experiential avoidance and psychological distress and presentation of somatic symptoms. The MEAQ distraction and suppression sub-scale did not correlate with the GHQ, BSI or sub-scales, the BSI Globus sub-scale was the only subscale not to correlate with any of the MEAQ variables. All significant correlations in the matrix (see Table 3.2.3.1) were positive; only two out of 40 correlations were negative.

	MEAQ Total	MEAQ Distress Aversion	MEAQ Distraction & Suppression	MEAQ Repression & Denial
GHQ TOTAL	.240*	.264*	.062	.204
BSI TOTAL	.302**	.312**	.106	.263*
BSI HEAD	.229*	-.174	.089	.271*
BSI CHEST	.211*	.207	.016	.231*
BSI ABDO	.312**	.398**	.161	.152
BSI FATIGUE	.192	.163	.022	.236*
BSI HEAT	.245*	.286*	.092	.172
BSI GLOBUS	.122	.085	.015	.173
BSI FREQUENCY	.259*	.279*	.179	.161
BSI PANIC	.145	.089	-.097	.285*

*. Correlation is significant at the 0.05 level (1-tailed).
**. Correlation is significant at the 0.01 level (1-tailed).

Table 3.2.3.1 – Correlations between GHQ, BSI, BSI Subscale and MEAQ

3.2.4 MODERATIONS – MEAQ, GHQ & BSI

The tendency for a patient for avoid experiences may impact the efficacy of treatment or placebo. Therefore, moderation analysis was undertaken in order to explore firstly, the total experiential avoidance as a moderator between pre- and post-treatment in the treatment and placebo group separately, age and gender were controlled for in the model. In the treatment group there was no moderation effect of the total MEAQ score on GHQ (p = .13), in the placebo group the overall model was significant [$F(5, 27)$ = 9.77, p < .001] explaining 64% of the variance in post-treatment BSI (R^2 = .64), the interaction term however, did not achieve statistical significance (p = .24). The overall model for the MEAQ total moderating the post-treatment BSI scores in the treatment group, was significant [$F(5, 23)$ = 26.57, p < .001] explaining 85% of the variance (R^2 = .85) the moderation interaction was also significant [$t(23)$ = 4.92, p < .001; β = .01]. As can be seen in Fig. 3.2.1 those with lower overall experiential avoidance benefitted from higher treatment efficacy in the treatment group. The J-N technique revealed that scores on the MEAQ above 77.85 will significantly moderate the post-treatment outcome for the patient on the BSI [$t(23)$ = 2.07, p =.05; β = .15].
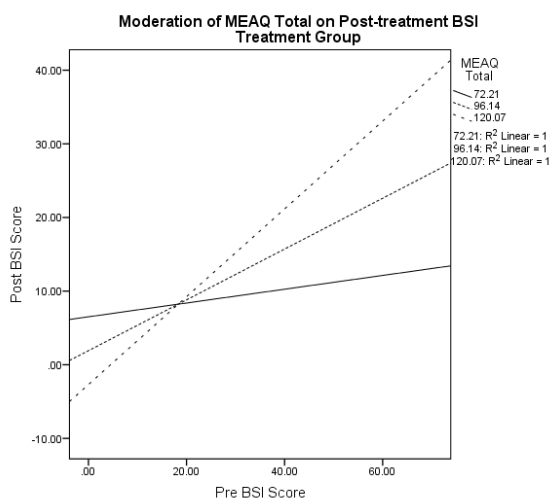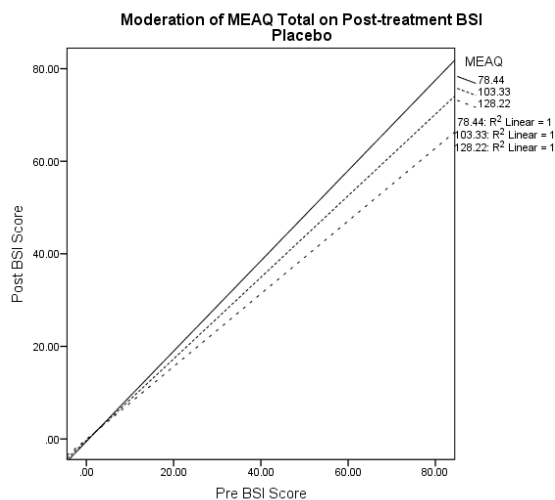
Figure 3.2.4.1

Figure 3.2.4.2

In the placebo group the overall model for the moderation was significant [$F(5, 27) = 17.38$, $p < .001$] explaining 76% of the variance in the post-treatment BSI scores ($R^2 = .76$). The moderation interaction was not significant, which indicates that overall MEAQ scores do not moderate treatment efficacy in the placebo group ($p = .24$). However, in Fig. 3.2.2 it can be seen that the higher the MEAQ score the more effective the placebo effect is, although this is not significant, it is noteworthy as it is the opposite to the treatment group effect.

To further explore the moderation effects of experiential avoidance on post-treatment outcomes, the three subscales of the MEAQ that were utilised for this study will be used as moderators for both treatment and placebo groups for the GHQ and BSI, once again controlling for age and gender. Distress aversion did not moderate the outcome of the GHQ in the treatment group ($p = .26$), it is important to note that this analysis only had an achieved power of .53, a further a-priori power analysis revealed that total sample size of 70 would be required to rule out a type 2 error with a power of .95, an effect size of .31 (observed in the current analysis) and an error probability of .05. For the placebo group however, the overall model was found to be significant [$F(5, 27) = 9.94$, $p < .001$] explaining 65% of the variance in the post-treatment GHQ ($R^2 = .65$), however, there was no significant moderation. Distress aversion did not significantly moderate the outcome of the BSI in the placebo group ($p = .64$), however, the overall model was significant [$F(5, 27) = 17.10$, $p <$

.001] explaining 76% of the variance in the post-treatment BSI ($R^2 = .76$). The moderation model for distress aversion on the BSI in the treatment group was significant [$F_{(5, 23)} = 19.05$, $p < .001$] explaining 81% of the variance ($R^2 = .81$). The moderation interaction term was also significant [$t_{(23)} = 4.15$, $p < .001$; $\beta = .02$], implying that the distress aversion component of experiential avoidance moderates the post-treatment outcomes on the BSI but only in the treatment group. As can be seen in Fig. 3.2.4.3, higher distress aversion scores result in reduced treatment efficacy, the J-N technique suggests that a distress aversion score above 32.26 would begin to significantly impact the efficacy of the treatment [$t_{(23)} = 2.07$, $p = .05$; $\beta = .18$]. Observing the normative data that is distributed with the MEAQ measure (Gámez et al., 2011), the distress aversion mean for 201 "community adults" was 34.40, this mean being close to the significance threshold would make sense, as it was
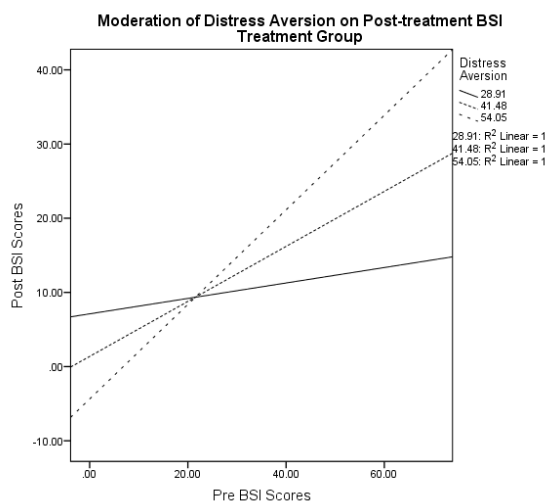
hypothesised that those with higher than average distress aversion scores would fare worse in treatment.
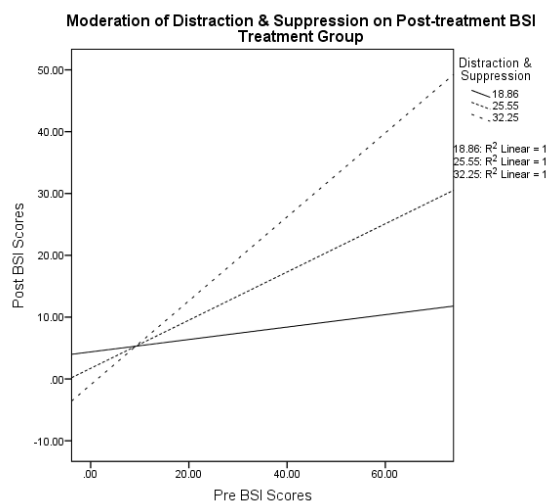
Figure 3.2.4.3   Figure 3.2.4.4

The distraction and suppression sub-scale did not moderate on the GHQ for the treatment group ($p = .25$) or the placebo group ($p = .19$), despite a significant overall model [$F_{(5, 27)} = 9.50$, $p < .001$]. Distraction and suppression significantly moderated the post-treatment BSI outcome, the overall model explained 81% of the variance [$F_{(5, 23)} = 20.01$, $p < .001$; $R^2 = .81$]. The moderation interaction term was significant [$t_{(23)} = 4.19$, $p < .001$; $\beta = .04$],

indicating that lower levels of distraction and suppression result in higher treatment efficacy (See Fig. 3.2.4.4). The J-N technique revealed that the moderator's significance threshold was 20.57 [$t(23) = 2.07$, $p = .05$] at and above this, treatment efficacy would be negatively impacted by distraction and suppression. Gámez et al. (2011) provided the mean of 25.64 for this subscale in a population of 201 community adults, according to the findings of this analysis, even those with average distraction and suppression scores would have slightly (but significant) reduced treatment efficacy. In the placebo group distraction and suppression, despite a significant overall model [$F(5, 23) = 17.09$, $p < .001$] predicting 76% ($R^2 = .76$) of the variance in post-treatment BSI scores, was not a significant moderator ($p = .73$). The repression and denial subscale of the MEAQ was tested to see if it moderated the post-treatment outcome of the GHQ. The placebo group showed significant overall model [$F(5, 27) = 9.00$, $p < .001$] but no significant moderation ($p = .82$), the treatment group did not provide a significant model ($p = .057$). For the BSI in the treatment group, the overall model was significant [$F(5, 23) = 40.10$, $p < .001$] and explained 90% of the variance ($R^2 = .90$). The moderation interaction term was also significant [$t(23) = 6.94$, $p < .001$; $\beta = .03$], and as can be seen in Fig. 3.2.4.5 the lower repression and denial scores the greater treatment efficacy if pre-treatment BSI scores were above 20, and the opposite if pre-treatment BSI scores were below 20. The J-N technique revealed when scores were above 16.74 [$t(23) = 2.07$, $p = .05$; $\beta = .13$], treatment efficacy was significantly moderated. For the placebo group, despite a significant overall model [$F(5, 27) = 23.48$, $p < .001$] the interaction term was not significant ($p = .0504$) meaning that repression and denial did not moderation the BSI outcomes in the placebo group.

Moderation of Respression & Denial on Post-treatment BSI
Treatment Group
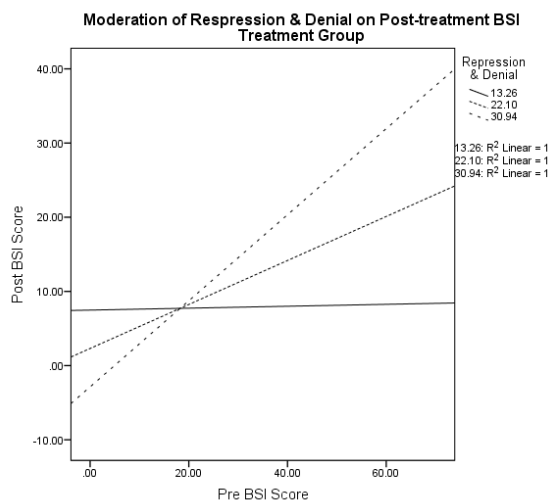
Figure 3.2.4.5

3.3 DISCUSSION

This study aimed primarily to examine the efficacy of acupuncture in the treatment of psychological and somatic distress, whilst also investigating the role of attachment and experiential avoidance in treatment outcome. The results of primary outcomes (see 3.2) confirm the hypothesis that genuine acupuncture will perform significantly better than placebo acupuncture in the treatment of psychological (GHQ) and Somatic (BSI) distress. These findings, being from a double blind randomised control trial, are likely to be robust, effect sizes are considerable which suggest that the benefit to those in the genuine acupuncture group, although significant, was also clinically relevant (O'Keefe, 2007). The results are also supported by previous literature that suggested that acupuncture is effective in the treatment of somatic distress (i.e. medically unexplained symptoms) (Errington-Evans, 2012; Madsen, Gøtzsche, & Hróbjartsson, 2009; Paterson et al., 2011; Wu et al., 2012). Further exploration of the sub-scales of the BSI showed that five of the eight sub-scales showed significant differences between placebo and treatment groups. The chest, abdomen, fatigue, globus and frequency sub-scales were all significant, previous research supports the efficacy of acupuncture for such complaints. For example, Richter, Herlitz, and Hjalmarson (1991), who conducted a randomised control trial, showed that instances of angina attacks significantly reduced in the genuine acupuncture group compared to placebo. It has also been noted that patients who suffer with chest pain and of Asian descent, are likely to use

acupuncture for pain management in conditions which involve chest pain (Kim, Jeong, & Ahn, 2004). Irritable bowel syndrome (IBS), arguably one of the most commonly observed MUSs in primary care (Spiegel et al., 2005; Zijdenbos, 2008), would fall under the abdomen sub-scale of the BSI. Previous research supports the finding that genuine acupuncture can benefit those with IBS (MacPherson et al., 2012; Reynolds et al., 2008; Schneider et al., 2007; Smith, 2008). Most recently a meta-analysis of randomised control trials for IBS revealed that there was a significant clinical improvement in genuine acupuncture when compared to a placebo. Four out of the six studies included in the meta-analysis used placebo acupuncture as a control the review included over 600 participants over three continents (Chao & Zhang, 2014). The significance of the Fatigue sub-scale also has support from previous literature from both explained and medically unexplained origins. Cancer related fatigue (CRF) is common among those undergoing chemotherapy or radiotherapy, a pilot study by Balk, Day, Rosenzweig, and Beriwal (2009) suggests that acupuncture may be beneficial for those who are currently experiencing cancer related fatigue. A larger multisite randomised control trial involving 302 participants showed that acupuncture significantly improve CRF outcomes, include depression and anxiety measures (Zhukovsky, 2013). Whilst CRF is very much medically explained, it is usually caused by the side effects of long term intoxication from chemotherapy drugs or radiation from radiotherapy. Another condition known as chronic fatigue syndrome (CFS) is very much medically unexplained. This type of fatigue is more likely to be somatic, due to its lack of organic origin (Price, 2009), and therefore more likely reflect the measurements of the BSI fatigue sub-scale. Previous research has indicated that acupuncture is effective in the treatment of CFS (Kim et al., 2015; Ng & Yiu, 2013; Yuemei, Hongping, Shulan, & Dongfang, 2006). It is important to note that although many of these conditions have been shown to overlap with somatic complaints, the current study could not classify participants as suffering with any particular complaint, instead the overall efficacy of acupuncture for psychological and somatic distress was the focus of interest, rather than constituent conditions. In doing

so, this study reveals that overall acupuncture treatment efficacy for psychological and somatic distress is superior to placebo.

It was also hypothesised that treatment efficacy would be maintained at follow up, with acupuncture upholding its post-treatment difference at eight-week follow-up. The results showed that at the eight-week follow-up point there was still a significant difference between treatment and placebo groups on both the GHQ and the BSI, therefore the hypothesis may be accepted. These results support the findings of previous research that suggest that the effects of acupuncture are sustained beyond the termination of treatment when compared to a control (Kjendahl, Sallstrom, Osten, Stanghelle, & Borchgrevink, 1997; Paterson et al., 2011). Lastly, with regards to the primary outcomes, it was hypothesised that those with medically unexplained symptoms would fare equally in treatment when compared to those who did not. This hypothesis is accepted as there were no significant differences between those with and without MUS, suggesting that acupuncture's efficacy is equal for both groups of participants, when treating psychological and physical distress.

Results from secondary outcomes aimed to help further understand the role of attachment and experiential avoidance in the practice of acupuncture. Evidence already exists to suggest that the attachment system may be implicated in acupuncture's therapeutic effect (Sochos & Bennett, 2016). However, comparison to a placebo group would establish if this effect is purely present in the relationship between practitioner and patient, or if acupuncture itself plays a mechanistic role in elicitation of this effect. It was hypothesised that attachment strategy would moderate the post-treatment BSI score (not GHQ) in the treatment group and not in the placebo group. This hypothesis may be partially accepted as only the secure attachment scale moderated the post-treatment BSI in the treatment group, one other significant moderation was present in the placebo group for those who were high in the dismissive attachment strategy. In the case of secure attachment moderating the post-treatment BSI in the treatment group, it was observed that higher levels of attachment security resulted in greater treatment efficacy. This supports the hypothesis that the

endogenous opioid system is activated during genuine acupuncture (Ma, 2004; Sochos & Bennett, 2016) as this moderation effect was not present in the placebo group. In the case of the significant moderation of the dismissive attachment style, higher dismissive attachment strategy resulted in better treatment efficacy, but only in the placebo group. This effect may have been observed in part because the individual with a dismissive attachment style typically engages in deactivation of the endogenous opioid system, particularly in times of distress, this mechanism could have improved the efficacy of the placebo effect as there was no external activation of the endogenous opioid system (Carvallo & Gabriel, 2006). These results are further supported by the findings of the moderation effects of the client attachment to therapist scale (CATS), although results were quite different, there are still clear differences between significances between placebo and treatment groups, indicating some mechanistic and causal link between acupuncture and the attachment system. For the BSI and GHQ, the secure attachment style was a significant moderator, but only in the placebo group. The results showed that those who perceived more attachment security between the practitioner and themselves fared worse in the placebo groups on both measures. This indicates that attachment security to the practitioner may provide a protective effect against the placebo effect, the lack of activation of the opioid system may be responsible for those with a more secure attachment strategy to fare worse in placebo treatment. This same pattern was seen for the preoccupied scale of the CATS, in the placebo group but only on the post-treatment BSI, the higher the preoccupied score, the worse the BSI treatment outcome became. The only significant moderation of the CATS in the treatment group was for the avoidant attachment style on the BSI, participants that had a higher avoidant attachment style with their practitioner fares worse in treatment with regard to somatic complaints. Returning to the endogenous opioid theory, over activation may not be desirable for those who score highly on the avoidant attachment strategy, as they would generally be expected to have a deficit in opioid function (Machin & Dunbar, 2011). With regards to the hypothesis that there will be differences in significance or direction in

moderation between placebo and treatment groups on BSI and GHQ for the CATS subscales, this can be partially accepted.

In order to support the theory that there is a link between somatic symptoms, psychological distress and experiential avoidance, it was hypothesised that there would be significant correlations between the MEAQ subscales and the GHQ and BSI. Results showed several significant correlations between the MEAQ and the BSI and GHQ indicating that the higher experiential avoidance a person presents with the higher the instance of psychological (GHQ) and somatic (BSI) distress. Interestingly with regards to somatic symptoms the distress aversion sub-scale showed a stronger positive correlation than the others, drilling down even further in to the sub-scales of the BSI it can be seen that this strength comes from a positive correlation with the abdomen sub-scale. This is seen to be supported in the literature with several studies confirming the positive relationship between higher levels of experiential avoidance and abdominal distress (Drews & Hazlett-Stevens, 2008; Ljótsson et al., 2010; Naliboff, Frese, & Rapgay, 2008). Moderation results from the subscales of the MEAQ show that all subscales moderate post-treatment outcomes on the BSI in the treatment group but not in the placebo group. In all of the four significant moderations, higher levels of experiential avoidance resulted in lower outcomes on the BSI, this reluctance to engage in experiences results in a much more difficult patient for acupuncture to treat, but only with regards to somatic symptoms. This relationship is supported by research by Tull et al. (2004) who showed that there were positive correlations between experiential avoidance, anxiety, depression and somatic symptoms. There were no significant moderations for the GHQ in either the placebo or treatment group. This suggests that higher levels of experiential avoidance only limits treatment efficacy of acupuncture for somatic symptoms and not for psychological distress.

The findings of this study highlight the effectiveness of acupuncture in the treatment of both psychological and somatic distress. Previous research has yet to test acupuncture's efficacy under such experimental conditions, and there has been a call for many years for

acupuncture research to embrace more single and double blind RCT methodologies (Chao & Zhang, 2014; Hopton & MacPherson, 2010; Kong, Lee, Shin, Song, & Ernst, 2010; Linde et al., 2009; Smith, Hay, & MacPherson, 2010; Trine, Terje, & Jianping; Trinh et al., 2006; Wu et al., 2006; Zhao, Du, Liu, & Wang, 2012; Zheng, Chen, Wu, Li, & Liang, 2010). This approach to discovering if acupuncture can perform better than a placebo is not without its limitations, not least of which is the potential lack of ecological validity. Participants who participated in this study were aware of the fact that they were participating in a double blind RCT and that they would either be receiving genuine or placebo acupuncture. This fact could have affected the way in which participants responded to the questions in post-treatment, particularly if patients had convinced themselves they were receiving genuine or placebo treatment. For instance, patients who believed they were in the treatment group may have overestimated their improvement, whilst those who believed they were in the placebo group may have underestimated. This phenomena is knows as confirmation bias, and is a cognitive bias that is unavoidable to a large extent, not just in these circumstances, but also in everyday life (Nickerson, 1998). One way to potentially control for this effect would be to ask patients to disclose which treatment they believed they were receiving at post-treatment and using this data as a covariate in analysis to control for this bias. Another way to address this lack of ecological validity would be to conduct a multi-centre quasi-experimental study to validate the findings in the treatment group of the current study. If these findings were similar to those seen in the current study, then it can be assumed that the findings of the current study were not affected by a lack of ecological validity.

This study also removes the potential impact of the practitioner in the therapeutic relationship. By using a single practitioner, it is not possible to see what variation in results might be due to the practitioners' own attachment style or level of experiential avoidance. It could be treatment efficacy relies entirely (or partly) on the practitioners' psychopathology, although this is unlikely to be the case. This could also further support the main findings of this study that acupunctures efficacy is beyond that of a placebo or talking therapy as an

absence of significant moderations of practitioner attachment style and experiential avoidance would suggest that the effect of acupuncture not impacted by these interpersonal factors. In this instance a study involving multiple practitioners could also be beneficial as some level of variance in scores would improve statistical reliability.

Lastly, the current study was unable to fully investigate the differences in treatment efficacy between those with a MUS diagnosis and those without. The literature suggests that in conventional treatments patients with MUS are difficult to treat, if this is the case with acupuncture there will be a difference in treatment response between those that have a MUS diagnosis and those who do not. The current study showed no significant difference between those who have a MUS and those who do not in terms of treatment efficacy. However, statistical power was weak and would benefit from re-testing in a larger trial.

In summary, this study had a primary aim of investigating the efficacy of acupuncture in the treatment of psychological distress and somatic symptoms. The results showed that acupuncture significantly outperformed placebo in both the treatment of psychological distress and somatic symptoms. This study also deepened the understanding of the role of the attachment system and experiential avoidance in acupuncture therapy, which could help better understand the mechanisms by which acupuncture works. The potential for the implication of the endogenous opioid system gives rise to further research questions which could help better understand how the brain reacts to acupuncture therapy and guide future research.

CHAPTER 4 – STUDY 2

A MULTI-CENTRE STUDY OF ACUPUNCTURE FOR THE TREATMENT OF PSYCHOLOGICAL DISTRESS AND SOMATIC SYMPTOMS

THE IMPACT OF PATIENT AND PRACTITIONER ATTACHMENT AND EXPERIENTIAL AVOIDANCE

4.1 AIMS/HYPOTHESES/RATIONAL

The primary aim of the second study is to validate the results from study one in order to improve the ecological validity of the main effects of treatment efficacy of acupuncture on the primary outcomes of the GHQ and BSI. In addition, this study aims to re-test the moderation findings of attachment and experiential avoidance on primary outcomes. Whilst the results from study one were statistically powerful and the methodology was of a high standard, there is a chance that the detected effects may not be observed outside of the experimental setting. In the first study it was not possible to analyse the differences in moderation effects of attachment between those who had been diagnosed with MUS and those who hadn't due to a lack of statistical power. Doing so could help better understand if those with MUS have their treatment efficacy reduced or boosted when accounting for their attachment style and/or levels of experiential avoidance. In addition, this study aims to explore the effects of the attachment style of the practitioner on therapeutic outcome, while continuing to explore the role of patient attachment and experiential avoidance on therapeutic outcomes. An understanding of the role of the therapist in therapeutic outcomes could help improve acupuncture training as with psychodynamic counselling (Mallinckrodt et al., 1995; Mallinckrodt et al., 2005). In addition, this study will give further evidence for the efficacy of acupuncture in the treatment of psychological and physical distress, which will help inform patient and practitioner choice.

Much like study one and research published by Sochos and Bennett (2016), it is predicted that there will be a significant reduction between pre- and post-treatment in both psychological and physical distress as measured by the GHQ and BSI respectively. It is predicted that there will be no significant difference in treatment efficacy, as measured by the GHQ and BSI, between practitioners. In addition, it is hypothesised that there will be no difference in treatment efficacy between those presenting with or without a MUS diagnosis. Theoretically it is not expected that scores on the RQ or the MEAQ will significantly differ between pre- and post-treatment. However, study one did show a significant difference in

RQ between pre- and post-treatment, although this difference was deemed practically insignificant as is only represented a very small change on a seven-point scale. Therefore, it is anticipated that this same significance will be found in this study. It is also hypothesised that treatment efficacy will be moderated by the participants' attachment style whereby those who exhibit greater attachment security will have better outcomes on the BSI. Whereas, this same moderation effect should be absent when using the GHQ as found in study one (see chapter 3.2). It is predicted that higher levels of experiential avoidance will moderate post-treatment outcomes on the BSI and not the GHQ in line with the findings of the first study. It is expected that there will be a difference in moderation effects of attachment (RQ) and experiential avoidance (MEAQ) between participants who have had a MUS diagnosis when compared to those who do not. It is hypothesised that the practitioners' attachment style will not moderate post-treatment outcome on either the BSI or GHQ when controlling for the attachment style of the participant. It is also predicted that greater client to practitioner (CATS) attachment security will not moderate post-treatment outcomes on the BSI and not the GHQ as seen in study one. It is also hypothesised that the MEAQ scores of practitioners will not moderate post-treatment outcomes on either the BSI or GHQ.

4.2 RESULTS OF PRIMARY OUTCOMES

The aim of this study was to validate the findings of study one that acupuncture is an effective treatment for physical and psychological distress. Descriptive statistics of primary outcomes measures (GHQ and BSI) indicate a post-treatment reduction in symptoms in line with this hypothesis. As can be seen in table 4.2.1 pre-treatment means were very similar to those of study one with the mean pre-treatment GHQ score in study one being 13.05 (*SD* 5.60) and in study two being 12.18 (*SD* 4.73). This is also seen in the means for pre-treatment BSI in study one (*M* = 25.72, *SD* 17.30) compared to study two (*M* = 26.22, *SD* 17.30). Similarly, post-treatment reduction in symptoms on the GHQ appear to be similar in study two (*M* = 8.82, *SD* 4.73) compared to study one (*M* = 5.00, *SD* 3.73). However, reduction on the BSI appears to be more apparent in study one (*M* = 9.55, *SD* 6.06) when compared to study two (*M* = 14.23, *SD* 8.35), despite this across both primary measures, after 5 treatments of acupuncture, there is a reduction in symptom severity on both the GHQ

	Study two participants (*N*=184)		Study one Genuine Group (*N*=22)	
Pre-Treatment GHQ, *M*(*SD*)	12.18	(4.73)	13.05	(5.60)
Post-Treatment GHQ, *M*(*SD*)	8.82	(4.74)	5.00	(3.73)
Pre-Treatment BSI, *M*(*SD*)	26.22	(16.73)	25.72	(17.30)
Post-Treatment BSI, *M*(*SD*)	14.23	(8.35)	9.55	(6.06)

and BSI.

Table 4.2.1 – Descriptive statistics of primary outcomes for study two participants.

In order to test for significant differences between pre- and post-treatment outcomes, a repeated measures MANOVA was conducted using time-point as the independent variable and the scores on the GHQ and BSI as dependent variables. Results of this analysis showed an overall main multivariate effect of time point [$F_{(2, 182)}$ = 103.43, $p < .001$; Wilk's Λ = .47, partial η^2 = .53] this indicates a significant difference across all DVs. Given this significance, univariate results were investigated and it was found that there were significant differences across both GHQ [$F_{(1, 183)}$ = 58.07, $p < .001$; partial η^2 = .24] and BSI [F (1,

183) = 187.35, $p < .001$; partial η^2 = .51]. This indicates a significant reduction in both physical (BSI) and psychological (GHQ) distress, analogous with the results of study one.

To further investigate the findings, further analysis was conducted using all sub-scales of the BSI as DVs without the presence of the GHQ. This analysis would give more detail about the specific dimensions of somatic symptoms that acupuncture is effective in treating. Results showed an expected main multivariate effect of time point on all of the BSI sub-scales [F (8, 176) = 25.49, $p < .001$; Wilk's Λ = .46, partial η^2 = .54]. Univariate results revealed that all subscales on the BSI demonstrated a significant (Table 4.2.2) reduction between pre- and post-treatment with the exception of frequency ($p = .51$).

Source	Measure	df	df Error	F	Sig.	Partial η^2
Time Point	BSI Head	1	183	19.08	<.001	.09
	BSI Chest	1	183	34.33	<.001	.16
	BSI Abdomen	1	183	35.26	<.001	.16
	BSI Fatigue	1	183	150.30	<.001	.45
	BSI Heat	1	183	9.08	.003	.05
	BSI Globus	1	183	17.44	<.001	.09
	BSI Frequency	1	183	.436	.51	.002
	BSI Panic	1	183	24.76	<.001	.12

[a] Computed using alpha = .05

Table 4.2.2 - Univariate Results for BSI Sub-Scale MANOVA

Whilst results are very similar in terms of statistical power, it could be that a practitioners training or experience is implicated in the effectiveness of acupuncture treatment. As acupuncture practitioner training is quite nationally standardised and all practitioners taking part in this study were both highly experienced and trained, it was predicted that there would be no significant difference in post-treatment reduction in symptoms on both the GHQ and BSI between practitioners. To test this a 2x5 factorial MANOVA was conducted using time-point as the repeated measures factor and practitioner as a between subjects' factor in the analysis. Results showed a significant multivariate main effect of practitioner [F (8, 356) = 2.23, $p = .03$; Wilk's Λ = .91, partial η^2 = .05] irrespective of time point. This suggests that there was a difference in all scores (BSI and GHQ) between practitioners not accounting for the differences pre- and post-treatment which must be taken in to consideration in order to

fully answer this hypothesis. The multivariate main effect of time was also significant [F (2, 178) = 98.90, p <. 001; Wilk's Λ = .47, partial η^2 = .53] as expected. Finally, the interaction term of pre-post-treatment and practitioner was also significant [F (8, 356) = 2.36, p = .02; Wilk's Λ = .10, partial η^2 = .05] suggesting that when accounting for both pre-post-treatment and the practitioner giving the treatment there is an effect on outcome on both the GHQ and BSI. In order to investigate whether this effect is statistically present in both the GHQ and BSI univariate statistics will be reported. Interestingly, univariate results reveal that the interaction effect is only significant on the GHQ [F (4, 179) = 65.51, p = .01; partial η^2 = .08] and not the BSI.

The significance of this interaction effect is best understood by comparing the interaction graphs of both the GHQ and BSI. As can be seen in figure 4.2.1 very few of the lines crossover indicating no interaction effect, whereas, in figure 4.2.2 both clinic 5 and 2 have much better results in reducing GHQ scores when compared to the other clinics, this crossover illustrates the significant interaction. In other words, results suggest that the practitioner is not a factor in acupunctures effect when treating somatic symptoms(BSI) but is when treating psychological distress(GHQ). An important note relating to this finding is the value of the partial eta^2 for the interaction term (η^2 = .05), this value is very low and indicates a very weak effect, despite its statistical significance. The partial eta^2 value implies that only 0.05% of the variance across both DVs is a result of the interaction term. When this is compared to the partial eta^2 of the time point (η^2 = .53) which accounts for 53% of variance in both DVs, it is clear that the effect of the practitioner, although statistically significant is practically meaningless in terms of effect size. Further analysis of practitioner attachment style and experiential avoidance could help to explain the differences in performance between practitioners when treating psychological distress (see 4.3.5).
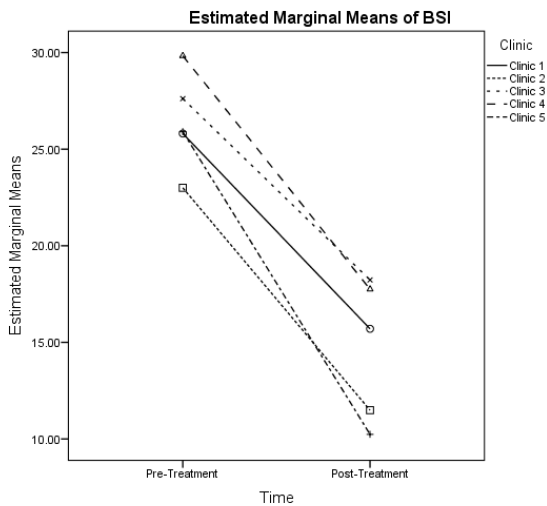
Figure 4.2.1
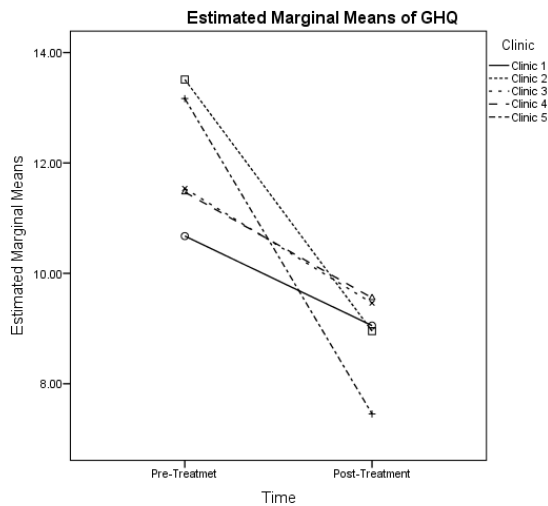
Figure 4.2.2

In order to test the hypothesis that there will be no significant difference in treatment efficacy between those who had been given a MUS diagnoses and those who has not, a factorial MANOVA was conducted using time point as the repeated measures factor and the presence of a MUS diagnosis as a between subjects' factor. Results showed a non-significant main effect of MUS diagnosis irrespective of time point (p = .09). The main effect of time was significant as expected [F (2, 181) = 76.99, p < .001; Wilks' Λ = .54, partial η^2 = .46], however, the interaction effect of time and MUS diagnosis was not significant (p = .07). This suggests that irrespective of the presence of a MUS diagnosis treatment efficacy is the same, this is best illustrated by the figures 4.2.3 and 4.2.4.
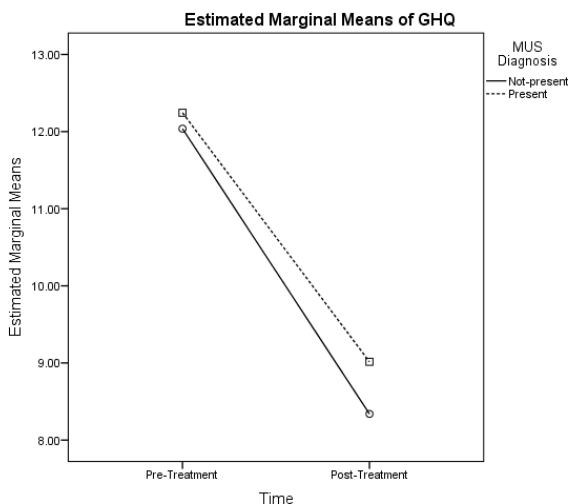
Figure 4.2.3
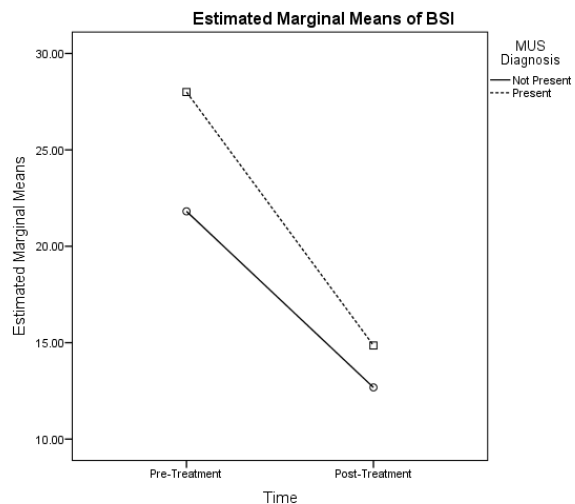
Figure 4.2.4

As the multivariate interaction term was not significant univariate results should not be explored as there is an increased risk of type 1 error.

4.3 RESULTS OF SECONDARY OUTCOMES

Secondary outcomes are those which are not expected to be modified by acupuncture treatment, but instead, may impact the way a participant responds to treatment. Therefore, it is expected that they shouldn't change between pre- and post-treatment, to test this a repeated measures MANOVA was conducted. The multivariate main effect of time point was significant [$F(4, 176) = 8.05$, $p < .001$; Wilks' $\Lambda = .85$, partial $\eta^2 = .16$]. Univariate results revealed a significant decrease in attachment security [$F(1, 179) = 11.03$, $p = .03$; partial $\eta^2 = .03$], a significant increase in fearful attachment [$F(1, 179) = 25.63$, $p < .001$; partial $\eta^2 = .13$], a significant increase in dismissive attachment [$F(1, 179) = 22.59$, $p < .001$; partial $\eta^2 = .11$] and a significant decrease in preoccupied attachment [$F(1, 179) = 4.06$, $p = .045$; partial $\eta^2 = .14$]. Despite these significant finding they are largely an artefact of the number of participants, all effect sizes are small with an overall effect size across all attachment styles of 16% (partial $\eta^2 = .16$). Most interestingly the mean difference between pre- and post-treatment on all attachment styles was lower than one point which, as with study one, represents a negligible change on the 7-point RQ scale (see Table 4.3.1).

Attachment Style	Pre-Treatment Mean (SD)	Post-Treatment Mean (SD)	Difference
Secure	4.17 (1.74)	3.82 (1.72)	0.35
Fearful	3.07 (1.60)	3.87 (1.72)	0.80
Preoccupied	3.20 (2.06)	2.87 (1.51)	0.33
Dismissive	3.38 (1.73)	4.10 (1.69)	0.72

Table 4.3.1 – Difference between attachment styles pre-post-treatment means.

4.3.1 MODERATIONS – ATTACHMENT, GHQ & BSI

In order to confirm the findings of study one where attachment style moderated post-treatment outcomes on the BSI but not on the GHQ, moderation analyses were conducted. All moderations included the other three attachment style scores in the regression model in order to control for their effects, in addition the age and gender of participants were controlled for as in study one. Unlike study one which included a placebo groups, for study

two all cases were analysed initially together. The Johnson-Neyman (J-N) was applied post-hoc to all moderations that showed a significant interaction effect in order to show at the threshold at which the moderator begins impacting the DV. The first moderation determined if attachment security moderated post-treatment outcomes on the GHQ. Results showed a significant overall model predicting post-treatment outcomes on the GHQ [F(8, 173) = 5.18, p < .001], which explained 19% (R^2=.19) of the total variance in GHQ scores. The moderation interaction term was not significant (p = .14) indicating that secure attachment does not moderate post-treatment outcomes on the GHQ as with study one. This result pattern was the same for fearful and dismissive attachment styles; the overall model for fearful [F(8, 173) = 4.84, p < .001] and dismissive [F(8, 173) = 4.93, p < .001] attachment was significant. However, interaction terms for both moderators was not significant (fearful p = .90; dismissive p = .44). For preoccupied attachment the overall regression model was significant [F(8, 173) = 5.61, p < .001] accounting for 21% (R^2=.21) of the variance in post-treatment GHQ scores. In addition, the interaction term was significant [t(173) = -2.24, p = .03; β = -.10] suggesting that preoccupied attachment style moderates post-treatment GHQ scores. The J-N technique revealed that that any score under 3.67 on the preoccupied question of the RQ would moderate the GHQ outcome. This result indicates that those with a higher level of preoccupied attachment have a better post-treatment outcome on the GHQ (Fig. 4.3.1.1).
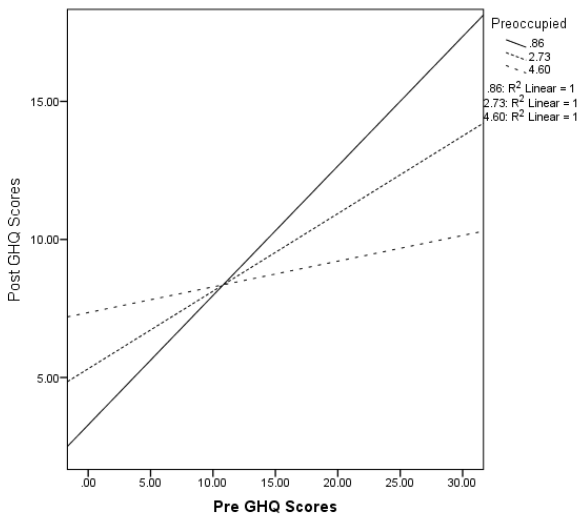
Figure 4.3.1.1
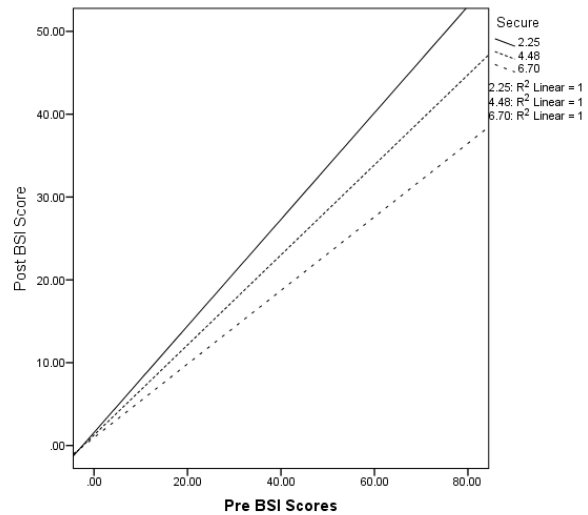
Figure 4.3.1.2

Further moderation analysis using the BSI as the DV and secure attachment as the moderator, provides an overall significant model [$F(8, 173)$ = 44.98, $p < .001$] accounting for 68% (R^2=.68) of variance in post-treatment BSI scores. The interaction term was also significant [$t(178)$ = -3.15, p = .002; β = -.04] indicating that those with a higher secure attachment score would receive improved acupuncture efficacy (Fig. 4.3.1.2). The J-N technique revealed that scores along any point on the moderator continuum would significantly moderate post-treatment outcomes on the BSI ($p < .001$). The model including fearful attachment showed a significant overall model [$F(8, 173)$ = 41.42, $p < .001$] accounting for 66% of the overall variance in post-treatment BSI (R^2=.66). The moderation interaction term was not significant (p = .71), meaning that fearful attachment doesn't moderate treatment BSI score reduction. The model including preoccupied attachment as the moderator accounted for 67% of the variance in post-treatment BSI scores. Both the model [$F(8, 173)$ = 43.02, $p < .001$] and interaction term [$t(173)$ = 2.13, p = .03; β = .03] was significant, however, unlike secure attachment, lower somatic symptom treatment efficacy was received by those who were higher in preoccupied attachment (Fig. 4.3.1.3). Probing the moderator using the J-N technique showed that all scores on the preoccupied question would result in a significant moderation of post-treatment BSI scores ($p <. 001$). Lastly, the model using dismissive attachment as the moderator was significant overall [$F(8, 173)$ = 42.43, $p < .001$] explaining 66% of the variance (R^2 = .66), but the interaction term was not (p

= .09) signifying no moderation effect of dismissive attachment on post-treatment BSI scores.

In order to address the hypothesis that there will be differences in moderation effects of attachment on post-treatment measures (GHQ and BSI) between those with and without a MUS diagnosis, two sets of eight moderation analyses were undertaken. The pairs (MUS vs. no MUS) of moderations will be reported simultaneously in order to compare differences. First, moderations for the GHQ were analysed the first pair showed that both MUS diagnosis [$F(8, 122) = 2.77$, $p = .01$] and non-MUS diagnosis [$F(8, 42) = 4.01$, $p = .001$] models were significant, explaining 15% ($R^2=.15$) and 43% ($R^2=.43$) of the variance respectively. However, neither the non-MUS diagnosed ($p = .52$) or MUS diagnosed ($p = .07$) moderation interaction terms were significant. This means that despite a MUS diagnosis, attachment security does not moderate treatment outcomes on the GHQ. The pair of models involving the fearful attachment style were both significant (MUS – [$F(8, 122) = 2.41$, $p = .02$] $R^2=.14$; Non-MUS - [$F(8, 42) = 5.04$, $p < .001$] $R^2=.49$). Those who were not diagnosed with a MUS had their treatment efficacy moderated by the fearful attachment score [$t(42) = -2.27$, $p = .03$; $\beta = -.14$]. As can be seen in figure 4.3.1.4 those with a higher attachment score fared better in treatment of psychological distress (GHQ).
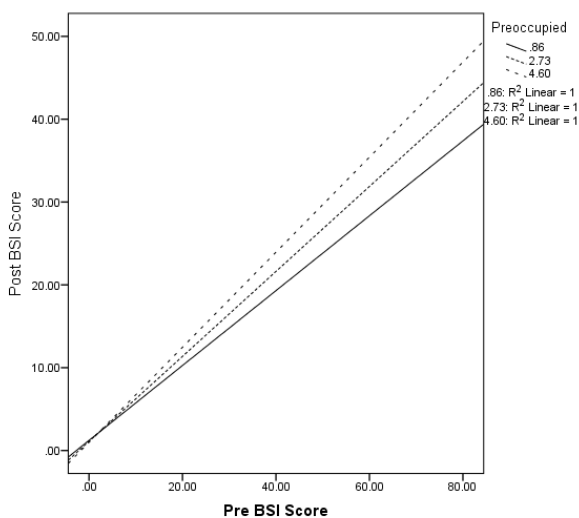
Figure 4.3.1.3
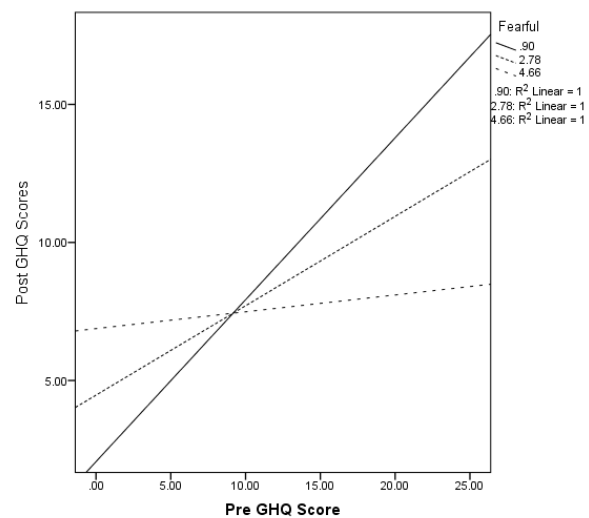
Figure 4.3.1.4

Post-hoc moderation probing using the J-N technique revealed that the moderator was only effective ($p = .05$) when it was below 3.38. Interestingly, the moderation interaction effect was not significant for those who did have a MUS diagnosis ($p = .35$), meaning that presenting with a MUS results in fearful attachment not moderating post-treatment outcomes on the GHQ. For non-MUS participants the overall model for preoccupied attachment was significant [$F(8, 42) = 4.14$, $p = .001$], this was also the case for those with a MUS diagnosis [$F(8, 122) = 2.88$, $p = .01$]. The models accounted for 44% ($R^2 = .44$) and 16% ($R^2 = .16$) of variance respectively. The moderation interaction term for those without a MUS diagnosis was not significant ($p = .32$), whereas for those with a MUS diagnosis was significant [$t(122) = -2.03$, $p = .045$; $\beta = -.12$]. Those who scored higher for the preoccupied attachment and presented with a MUS diagnosis fared better in treatment (Fig. 4.3.1.5), this effect was not present in those without a MUS diagnosis. J-N moderator probing revealed that the moderator (preoccupied attachment score) only caused changes in post-treatment GHQ scores when it was below 3.07 ($p = .05$).
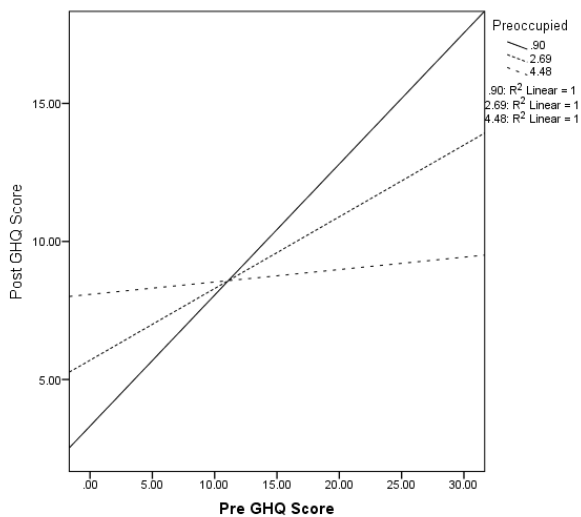
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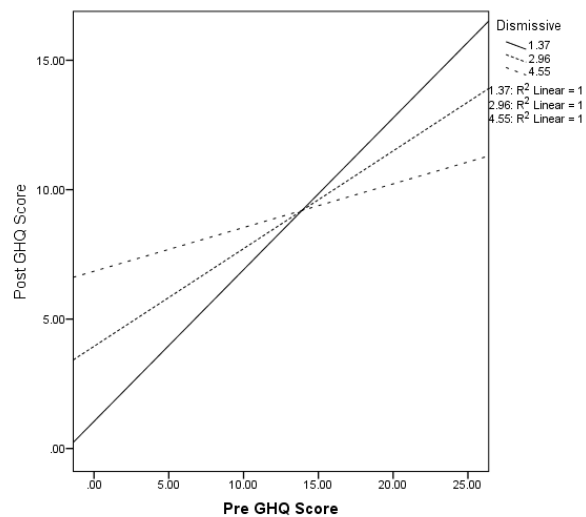
Figure 4.3.1.6

Finally, for the dismissive attachment style, the group with a MUS diagnosis had a significant overall model [$F(8, 122) = 2.29$, $p = .03$] which accounted for 13% of the variance in post-treatment GHQ scores ($R^2 = .13$). The non-MUS group model was also significant [$F(8, 42) = 5.60$, $p < .001$], explaining 52% of the overall variance in post-treatment GHQ scores

(R^2=.52). Moderation interaction terms were not significant for those with a MUS diagnosis (p = .88) but were significant for those without a MUS diagnosis [$t(42)$ = -2.78, p = .01; β = -.13]. In this instance, having no MUS diagnosis and both high dismissive attachment and BSI scores would result in better post-treatment outcomes (Fig. 4.3.1.6). The J-N technique was applied post-hoc and revealed that scores under 4.09 on the dismissive scale would significantly (p = .05) moderate post-treatment outcomes on the GHQ.

The same set of 8 moderations were ran using the pre- and post-treatment BSI scores at the focal predictor and the DV. Secure attachment models were significant in both non-MUS [$F(8, 42)$ = 15.88, p < .001] and MUS [$F(8, 122)$ = 28.79, p < .001] groups explaining 65% (R^2=.65) and 75% (R^2=.75) of variance in post-treatment BSI scores respectively. In the non-MUS group, the moderation interaction term was not significant (p = .17), whereas, in the MUS diagnosed group the moderation term was significant [$t(122)$ = -2.62, p = .01; β = -.04]. This significant term indicates that those with higher secure attachment see greater improvement compared to those with lower attachment security scores (Fig. 4.3.1.7). The J-N technique showed that the moderation effect was present across all points on the 7-point secure scale (p < .001). This result suggests that the treatment response of the participant is fundamentally different depending on whether they have or do not have a MUS diagnosis.
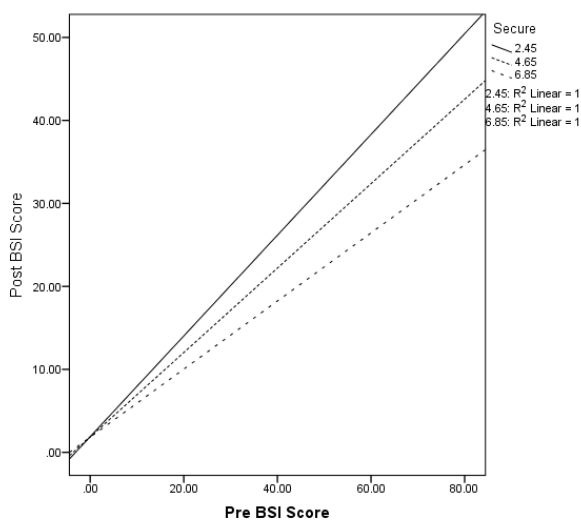
Figure 4.3.1.7
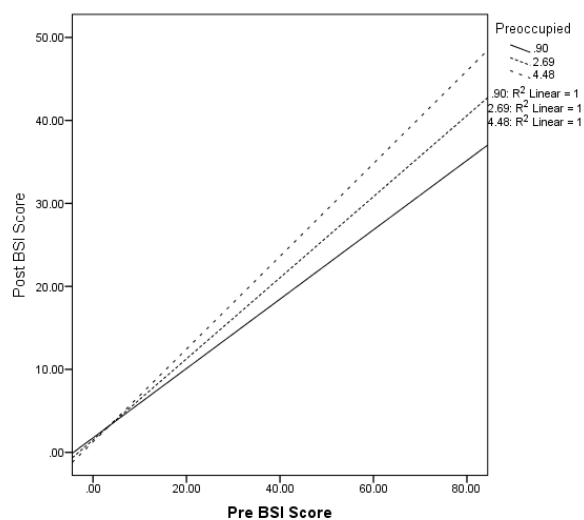
Figure 4.3.1.8

Results of the fearful models were significant for both MUS diagnosed [$F_{(8, 122)}$ = 26.49, p < .001] and non-diagnosed [$F_{(8, 42)}$ = 15.57, p < .001], accounting for 63% (R^2=.63) and 75% (R^2=.75) of the variance respectively. Moderation interaction terms were both non-significant, meaning fearful attachment does not moderate BSI treatment outcomes for either those with or without a MUS diagnosis (p > .05). Preoccupied attachment models were significant for both the MUS diagnosed [$F_{(8, 122)}$ = 28.18, p < .001; R^2=.65] and the non-MUS diagnosed groups [$F_{(8, 42)}$ = 14.95, p < .001; R^2=.74]. The moderation interaction term for the non-MUS group was not significant (p = .83). However, for the MUS group the moderation term was significant [$t_{(122)}$ = 2.27, p = .02; β = .04], implying that higher scores on the preoccupied scale would result in worse treatment outcome on the BSI (Fig. 4.3.1.8). The J-N technique showed that the entire continuum of the preoccupied attachment scale would result a significant moderation of post-treatment BSI scores. Finally, for the MUS diagnosed group, the overall model for dismissive attachment was significant [$F_{(8, 122)}$ = 26.59, p < .001] explaining 64% (R^2=.64) of the variance in post-treatment BSI. This was the same for the non-MUS diagnosed group [$F_{(8, 42)}$ = 18.86, p < .001], explaining 78% (R^2=.78) of the variance. The moderation interaction term for the MUS group was not significant (p = .49) but was significant for the non-MUS diagnosed group [$t_{(42)}$ = 2.86, p = .01; β = .12]. Higher scores on the dismissive scale resulted in worse outcomes on the BSI scale (Fig. 4.3.1.9). The J-N technique revealed that all points on the dismissive scale resulted in significant moderation of the DV.
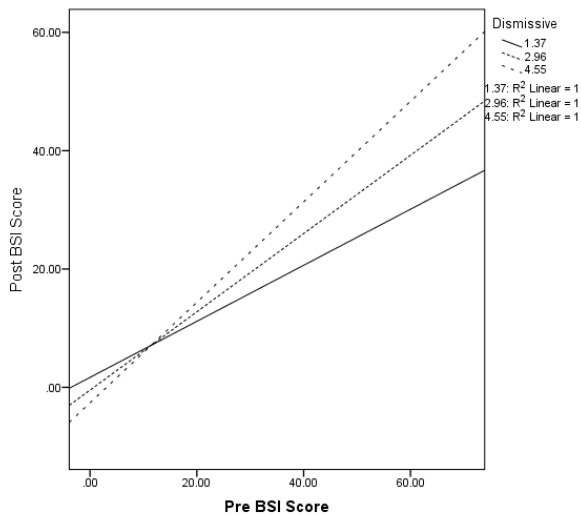
Figure 4.3.1.9

4.3.2 MODERATIONS – CATS, GHQ & BSI

The CATS measures the relationship that the client forges with their practitioner throughout their treatments. Unlike the RQ which measures a persons' general attachment style the CATS instead measures the attachment style between two people on three sub-scales; secure, avoidant or preoccupied. This measure was only taken post-treatment as at pre-treatment no relationship existed between the participant and practitioner rendering it's administration moot. It is expected that there will be no significant moderation effects of any of the CATS subscales on either the GHQ or the BSI. In all moderation analyses, as with the RQ, the two remaining sub-scales will be entered in to the model in order to control for their effect. In addition, as with previous moderation analysis, age and gender will also be controlled for.

Attachment security between the participant and practitioner did not moderate post-treatment outcomes on the GHQ ($p = .52$). However, the overall regression model was significant [$F(7, 173) = 7.59$, $p < .001$], explaining 24% of the variance of post-treatment GHQ scores ($R^2=.24$). The same pattern of results was observed with the avoidant sub-scale of the CATS, the overall model was significant [$F(7, 173) = 7.85$, $p < .001$], and explained 24% of the variance of the GHQ ($R^2=.24$). The moderation interaction term was not significant ($p = .18$). Lastly, with the preoccupied sub-scale the overall model was significant

[$F(7, 173) = 7.54$, $p < .001$], and accounted for 23% of the variance of post-treatment GHQ scores ($R^2=.23$). These results suggest that acupuncture's treatment efficacy is not moderated by the relationship that forms between client and therapist.

The same set of moderation analyses were conducted for the BSI scale. The secure sub-scale overall model was significant [$F(7, 173) = 48.78$, $p < .001$], and explained 66% of the variance of post-treatment BSI scores ($R^2=.66$). The moderation interaction term was not significant ($p = .97$). The overall model for the avoidant sub-scale was significant [$F(7, 173) = 49.71$, $p < .001$], explaining 67% of the variance in post-treatment BSI scores. The moderation interaction term was also, not significant ($p = .14$). Finally, the same pattern of results was observed with the preoccupied sub-scale, the overall model was significant [$F(7, 173) = 48.81$, $p < .001$]. The model explained 66% of the variance in post-treatment BSI scores ($R^2=.66$), but the interaction term was not significant ($p = .76$). These results indicate no presence of a moderation effect of participants to practitioner attachment on treatment efficacy of acupuncture for somatic symptoms (BSI). These results appear to differ slightly from study one, in that, one significant moderation of the avoidant sub-scale was observed in the treatment group on the BSI scale, but there were no significant moderations on either scale in this study. All other moderation findings were the same in terms of significance.

As with the moderations of the RQ, analysis was also conducted using the CATS sub-scales dividing participants in to those who had been given a MUS diagnosis and those who had not. Due to the emotional involvement of MUS it could be that this group of people rely more or less heavily on the client to therapist attachment style for treatment efficacy. As with the RQ results will be paired in order to be able to compare the MUS group to the non-MUS group for differences in moderation effects. The secure attachment style overall model was significant for both non-MUS [$F(7, 42) = 4.26$, $p = .001$] and MUS [$F(7, 123) = 4.72$, $p < .001$] diagnosed groups. Models explained 42% and 21% of the variance in post-treatment scores on the GHQ and BSI respectively. Both moderation interaction term for the non-MUS ($p =.37$) and MUS ($p = .62$) groups were non-significant, indicating that the presence of an

MUS diagnosis did not impact the moderation of participants' attachment to the practitioner on post-treatment outcomes of the GHQ. For the attachment avoidance sub-scale for those without a MUS diagnosis the overall model was significant [$F(7, 42) = 4.23$, $p = .001$] explaining 41% of the variance in GHQ scores post-treatment ($R^2=.41$). The moderation interaction term was not significant ($p = .42$). For the MUS diagnosed group the overall model was significant [$F(7, 123) = 5.48$, $p < .001$], accounting for 24% of the variance in GHQ scores. In addition to this the moderation interaction term was also significant [$t(123) = -2.11$, $p = .04$; $\beta = -.03$] suggesting that lower scores on the avoidance scale would result in greater treatment efficacy when treating lower levels of psychological distress. However, higher avoidant scores would provide better treatment to those who presented with higher initial levels of psychological distress (Fig. 4.3.2.1). According to the J-N technique, a score higher than 17.02 on the avoidant sub-scale of the CATS would allow for a significant moderation of the DV ($p = .05$). Lastly, for the GHQ the preoccupied sub-scale revealed significant overall models for both MUS [$F(7, 123) = 4.69$, $p < .001$] and non-MUS [$F(7, 42) = 4.25$, $p = .001$] diagnosed groups, accounting for 21% ($R^2=.21$) and 41% ($R^2=.21$) respectively. Neither of the moderation interaction terms for MUS ($p = .39$) and non-MUS ($p = .81$) diagnosed groups was significant. These results indicate that scores on the avoidant attachment sub-scale of the CATS moderate post-treatment outcomes of the GHQ when a MUS diagnosis is present.

The secure attachment sub-scale of the CATS provides two significant overall models for the non-MUS diagnosed [$F(7, 42) = 19.83$, $p < .001$] and the MUS diagnosed [$F(7, 123) = 29.71$, $p < .001$], these explained 77% and 63% of the variance in post-treatment BSI scores respectively. The moderation interaction terms for both the groups were not significant ($p = .19$; $p = .78$). Next, the avoidant sub-scale revealed two significant overall models for MUS diagnosed [$F(7, 123) = 29.96$, $p < .001$] and non-diagnosed [$F(7, 42) = 22.68$, $p < .001$] groups, accounting for 63% ($R^2=.63$) and 79% ($R^2=.79$) of the variance respectively. The MUS diagnosed group had no significant moderation interaction term ($p = .39$). Conversely

the non-MUS diagnosed group had a significant moderation interaction term [$t(42)$ = -2.56, p = .01; β = -.02], suggesting that an increased avoidance sub-scale score on the CATS leads to increased treatment efficacy on the BSI outcome measure (Fig 4.3.2.2). The J-N technique reveals that only scores below 28.37 (p = .05) on the avoidant CATS subscale would result in a significant moderation of the BSI post-treatment scores. Lastly, the preoccupied attachment sub-scale provided two significant overall models for the MUS [$F(7, 123)$ = 29.91, p < .001] and non-MUS [$F(7, 42)$ = 20.34, p < .001] diagnosed groups, accounting for 63% and 77% of the variance respectively. Moderation interaction terms were not significant for either the MUS (p = .45) or non-MUS (p = .11) diagnosed groups. These
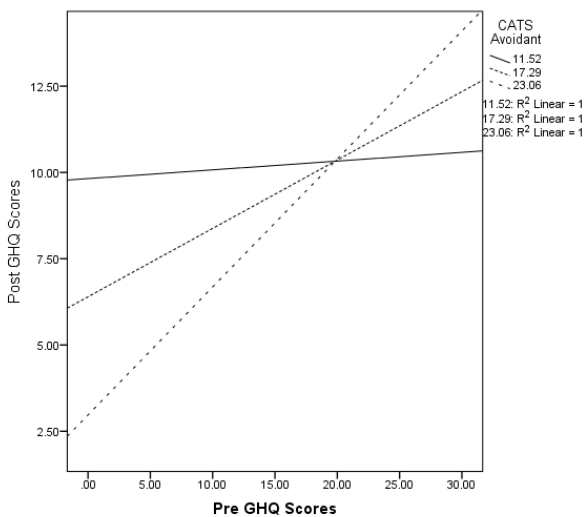
results suggest that with the moderation effect of the sub-scales of the CATS are not affected by the presence of a MUS diagnosis, with the exception of avoidant attachment which moderated the non-MUS diagnosed group on post-treatment BSI scores.
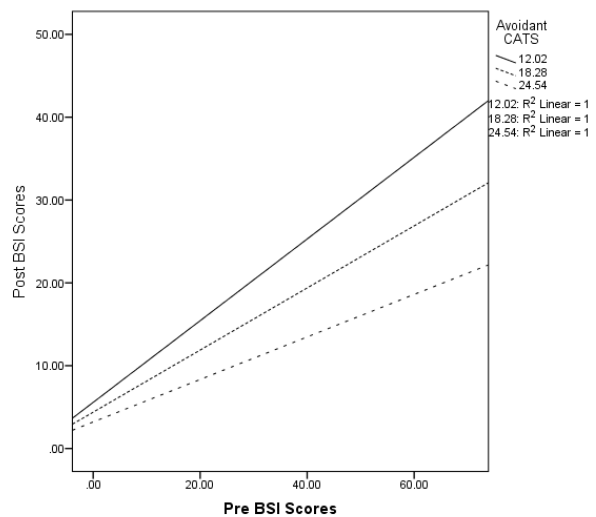
Figure 4.3.2.1   Figure 4.3.2.2

4.3.3 MODERATIONS – MEAQ, GHQ & BSI

Experiential avoidance as measured by the MEAQ is expected to moderate outcomes on the BSI but not on the GHQ as with study one. Once again as with previous moderation analysis, age and gender will be controlled for. The overall model for total MEAQ scores moderating post-treatment GHQ was significant [$F(5, 173)$ = 8.80, p < .001] explaining 20%

of the post-treatment variance (R^2=.20). The moderation interaction term, did not however, reach statistical significance (p = .19) meaning that in the treatment of psychological distress, experiential avoidance did not moderate acupuncture's efficacy. For the BSI however, there was a significant overall model [F(5, 173) = 51.42, p < .001] that accounted for 60% of the variance in post-treatment BSI scores (R^2=.60). In addition to this the moderation interaction term was also significant [t(173) = 2.47, p = .01; β = .002], indicating that those with higher levels of total experiential avoidance would fare worse in treatment of somatic symptoms as in study one (Fig. 4.3.3.1). The J-N technique results indicate that scores on the total MEAQ of 20.02 and over would elicit a significant moderation effect on the post-treatment BSI scores, this is also the same finding as study one.

To further explore these results separate moderation analysis will be conducted on the sub-scales of the MEAQ. This should uncover if there is any one facet of experiential avoidance that is contributing to the significant effect on the BSI or if this is a result of multiple avoidance techniques. During these moderation analyses the sub-scales that are not being investigated as the moderators will be added to the statistical model in order to control for their effects. The GHQ will not be further investigated in this manner to avoid the chances of a type one error. To begin the distress aversion sub-scale analysis revealed a significant overall model [F(7, 171) = 40.54, p < .001] which explained 62% of the overall variance in post-treatment BSI scores (R^2=.62). The moderation interaction term was not significant (p =.07), suggesting that distress aversion did not moderate treatment efficacy in the treatment of somatic symptoms. The distraction and suppression sub-scale overall model for the BSI was significant [F(7, 171) = 41.86, p < .001] and explained 63% of the overall variance in the post-treatment BSI (R^2=.63). The moderation interaction term was also significant [t(171) = 2.63, p = .01; β = .01], indicating that those with higher distraction and suppression scores would fare worse in treatment of somatic symptoms (BSI). The J-N technique revealed that scores on the distraction and suppression sub-scale would significantly moderate post-treatment outcomes on the BSI with scores over 6.22. Although this score on the distraction

and suppression sub-scale seems low to have a moderating effect on post-treatment scores, it is important to note that the beta (β) of the moderation effect is very low, meaning a very weak moderation effect. This can be observed by the closeness of the three lines in figure 4.3.3.2 indication little difference in treatment efficacy between those with high, moderate and low score on this sub-scale. The final subscale of the MEAQ is repression and denial whilst the overall model was significant [$F(7, 171) = 39.89$, $p < .001$] and explained 62% of the variance in post-treatment BSI scores ($R^2=.62$), the moderation interaction term to not achieve statistical significance ($p = .21$). This subsequent exploration has uncovered that distraction and suppression is the only subscale of the MEAQ that provides a significant moderation effect on post-treatment BSI scores. This result is the same as study one as the only treatment group sub-scale to provide a significant moderation effect was distraction and suppression (See 3.2.4).
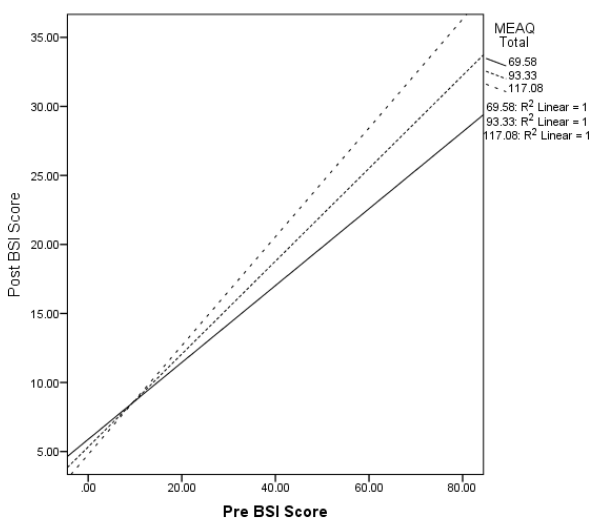
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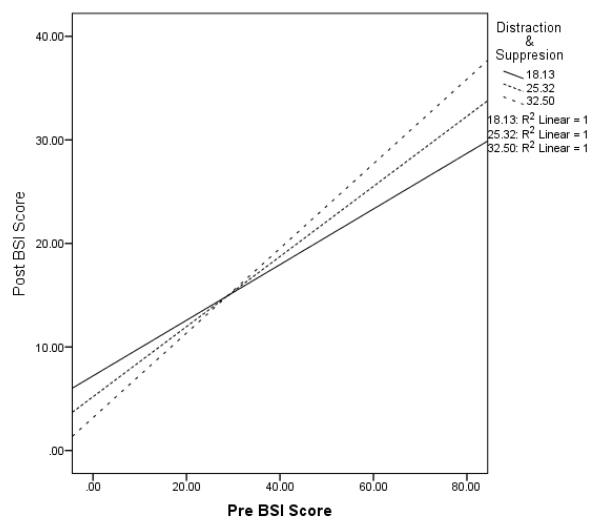
Figure 4.3.3.2

It is possible that those with a MUS diagnosis may engage with negative experiences differently to those who do not have a MUS diagnosis. A comparison of two moderations using the sole significant sub-scale moderator of the MEAQ (distraction and suppression) on BSI was undertaken. The non-MUS group provided a significant overall model [$F(7, 42) = 11.40$, $p < .001$] accounting for 66% ($R^2=.66$) of the overall variance in the post-treatment

BSI scores. The moderation interaction term was not significant ($p = .67$). In the MUS group the overall model was also significant [$F(7, 121) = 29.69$, $p < .001$] accounting for 63% of the variance in BSI scores ($R^2 = .63$). As with the non-MUS diagnosed group the moderation interaction term was not significant ($p = .08$). Although both interaction terms are not significant it is interesting to note the difference in their significance values, which may be indication of the different way in which those with a MUS react when receiving acupuncture treatment.

4.3.4 MODERATIONS – PRACTITIONER GENERAL ATTACHMENT, BSI & GHQ

One aim of this study was to investigate if the attachment style of the practitioner moderated treatment outcomes. In order to test this a series of moderation analyses were conducted, these included the participant age and gender as well as their scores from the RQ in order to control for the participant attachment effect. As with previous moderation analysis the practitioner attachment styles that were not entered in to the model as moderators were instead entered in to the model to control for their effect. The first set of analyses were conducted on the GHQ, the overall model for practitioner attachment security scores was significant [$F(12, 169) = 3.33$, $p < .001$] explaining 19% of the overall variance in post-treatment GHQ scores ($R^2 = .19$). However, the moderation interaction term was not significant ($p = .94$). This same pattern of results was observed for practitioner fearful attachment where the overall model was significant [$F(12, 169) = 3.34$, $p < .001$; $R^2 = .19$] but the moderation interaction term was not ($p = .78$). For preoccupied attachment the overall model was significant [$F(12, 169) = 3.35$, $p < .001$] explaining 19% of the variance ($R^2 = .19$), but once again the moderation interaction term was not significant ($p = .67$). Lastly, for the GHQ, the practitioners' dismissive attachment overall model was significant [$F(12, 169) = 3.34$, $p < .001$] accounting for 19% of the post-treatment variance ($R^2 = .19$), but the moderation interaction term was not ($p = .80$). These results suggest that the attachment style of the practitioner does not moderate the psychological distress (GHQ) treatment efficacy of acupuncture.

The same set of moderation analyses were undertaken using the BSI as the DV and results revealed a similar pattern with practitioner secure scores providing a significant overall model [$F(12, 169) = 36.52$, $p < .001$] explaining 72% of the post-treatment variance ($R^2 = .72$). However, the moderation interaction term did not achieve statistical significance ($p = .25$). The practitioner fearful attachment model was also statistically significant [$F(12, 169) = 36.65$, $p < .001$] explaining 72% of the variance in post-treatment BSI scores, but the moderation interaction term was not significant ($p = .19$). The same was found of the practitioner preoccupied analysis, where the overall model was significant [$F(12, 169) = 36.66$, $p < .001$; $R^2 = .72$] but the moderation interaction term was not ($p = .18$). Lastly, the dismissive practitioner attachment style yielded a significant overall model [$F(12, 169) = 37.43$, $p < .001$] explaining 73% of the variance in post-treatment BSI scores. This time, however, the moderation interaction term was also significant [$t(169) = -2.09$, $p = .04$; $\beta = .02$]. These results indicate that with the exception of dismissive attachment, practitioner attachment style is not implicated in the treatment efficacy of acupuncture for the treatment of somatic symptoms. The one significant moderation suggests that the higher the practitioners dismissive score, the better treatment effect will be for the patient (Fig. 4.3.4.1).
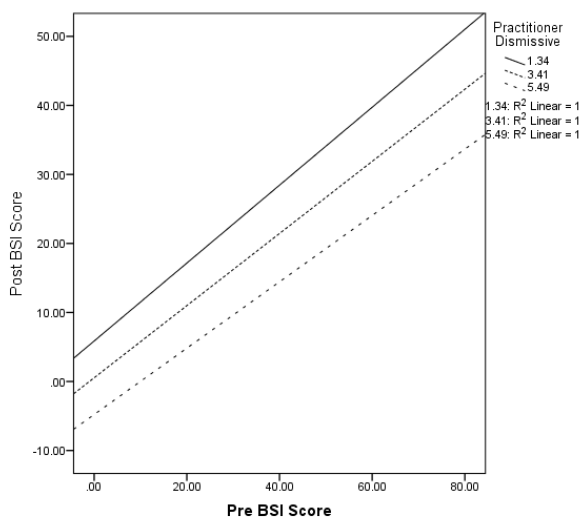
Figure 4.3.4.1

4.3.5 MODERATIONS – PRACTITIONER MEAQ, GHQ & BSI

As with the previous section, experiential avoidance levels of the practitioner may also moderate treatment efficacy. It was predicted however, that there would be no moderation of practitioner MEAQ levels on either the GHQ or BSI. In order to test this two moderation analyses were conducted one for GHQ scores and one for BSI, once again age and gender were controlled for, in addition the MEAQ scores of participants were also added in to the model to control for their effect. Results showed that the overall model for total practitioner MEAQ score on post-treatment GHQ outcomes was significant [$F(6, 172) = 7.12$, $p < .001$] and explained 20% of the variance ($R^2=.20$). The moderation interaction term was not significant ($p = .42$) meaning that there was no moderation effect of practitioners' levels of experiential avoidance on post-treatment GHQ scores. The same analysis was conducted using BSI scores as the DV and results indicated a significant overall model [$F(6, 172) = 40.25$, $p < .001$] accounting for 58% of the variance in post-treatment BSI scores. However, the moderation interaction term was also not significant ($p = .90$), indicating that practitioners' experiential avoidance levels did not moderate treatment outcomes on the BSI. Further analyses of sub-scales of the MEAQ are contraindicated due to the inflated risk of a type one error, given the non-significant findings of the MEAQ total.

4.4 DISCUSSION

The primary aim of study two was to validate the findings of study one in that acupuncture is an effective treatment of psychological distress and somatic symptoms as seen in study one. By utilising a quasi-experimental multi-centre design, study two also aimed to increase the ecological validity of study one by observing effects in the real world with limited experimental manipulation. It was hypothesised that post-treatment scores on both the GHQ and BSI would be significantly reduced after 5 treatments of acupuncture across all participating clinics. This hypothesis can be accepted as results showed statistically significant differences between pre- and post-treatment outcomes on both the GHQ and BSI. Not only were these results deemed statistically significant, but the sizes of the effects on both DVs also indicate a meaningful clinical reduction in symptoms. This finding confirms the effects seen in study one where acupuncture was compared to a placebo, and also supports existing literature which suggests that acupuncture is beneficial for the treatment of both psychological and physical distress (Errington-Evans, 2012; Madsen et al., 2009; Ng & Yiu, 2013; Paterson et al., 2011; Wu et al., 2012). The additional analysis of sub-scales of the BSI showed that all sub-scales apart from frequency were significantly different between pre- and post-treatment. In comparison to study one, a higher number of the sub-scales were significant in study two, this could be a result of the increased number of participants and may indicate that study one was under powered due to lower numbers of participants in the treatment group.

The results of treatment efficacy differences between practitioners revealed a significant interaction of practitioner and pre- post-treatment outcomes on the GHQ. Whilst all practitioners were able to provide a significant reduction in scores on the GHQ over the five acupuncture treatments, two of the practitioners were able to reduce GHQ means to a much larger extent. There could be many reasons for this effect existing, the effect size of the interaction suggests that the differences observed between practitioners, whilst statistically significant, represented a very weak effect. Given the small number of practitioners that participated in the trial, it is difficult to draw any firm conclusions regarding the reasons for

the significance of this interaction. A wider scale trial using 20 practitioners, could result in a more meaningful analysis. The presence of this significant interaction is quite novel and, of the studies searched, none appear to compare practitioners' outcomes to one another despite many multi-centre trials being conducted (Diener et al., 2006; Endres et al., 2007; Molsberger, Schneider, Gotthardt, & Drabik, 2010; Streitberger et al., 2004; White et al., 2000 to name but a few.). Instead, research appears to focus on the ability for practitioners of TCM to come to the same conclusions with regards to diagnosis, for some unknown reason the diagnosis rather than the outcome of the patient has been the focus of inter-practitioner comparison research (e.g. Hogeboom, Sherman, & Cherkin, 2001; Zhang, Jiang, Chen, & Lu, 2012; Zhang et al., 2005; Zhang et al., 2008). It is important to note that differences in treatment efficacy between practitioners could be a result of their training and/or number of years in practice. Previous research by Robinson et al. (2012); Xue et al. (2015) has revealed that there are differences in both practice and training between the EU and China. They have suggested that future research should be planned so that it is sensitive to these differences and recommends more collaboration between the EU and China in research to better understand these differences and the potential clinical impact that might result.

Study one provided evidence that those with a MUS diagnosis would not fare worse in acupuncture treatment as they do in conventional treatments (Burton, 2012; Creed et al., 2011). Study two reinforces this finding by results showing no significant difference in treatment efficacy on either the GHQ or BSI for those with a MUS diagnosis or those without. Therefore, the hypothesis that no significant difference would be seen between those with and those without a MUS diagnosis can be accepted. The literature doesn't currently appear to include any trials where a general population sample has been taken and compares acupuncture treatment efficacy between those who have a MUS diagnosis and those who don't. Current evidence for the difficulty to treat those with MUS diagnoses comes from anecdotal reports (Burton, 2012; Creed et al., 2011) and satisfaction of type of treatment received (Fritzsche et al., 2011).

Secondary outcome results in both studies attempt to explain treatment efficacy on intra (MEAQ) and interpersonal (RQ, CATS) dimensions. Study one provided evidence that attachment style moderated post-treatment outcomes differently between the placebo and treatment group. In study two similar results were observed whereby scores on certain attachment questions (RQ) moderated post-treatment outcomes. The hypothesis that attachment scores would moderate post-treatment outcomes on the BSI can be partially accepted as two significant moderations were found (secure attachment and preoccupied). As expected these behaved in an opposing manner whereby a high level of attachment security resulted in better post-treatment outcomes on the BSI and a higher level of preoccupied attachment would result in a worse outcome. This is similar to the findings of study one, however, study one had one significant moderation of secure attachment. The betas for all significant moderation analyses show a weak, but still statistically significant, effect of the moderation on the DV suggesting that any effect that does exist is subtle. As discussed in the introduction (see. 1.2.1 & 1.4.2) endogenous opioids are implicated both in acupuncture treatment and in the attachment system. During acupuncture treatment, research suggests that endogenous opioids are released which are potentially the mechanism of acupunctures analgesic effect (Han, 2004; Ma, 2004). In addition to this, studies have concluded that attachment strategy impacts the way in which individuals engage with the activation of the opioid system (Errington-Evans, 2012; Madsen et al., 2009; Wu et al., 2012). The ability for higher levels of attachment security to moderate post-treatment outcomes on the BSI may be evidence of a link between these two elicitation mechanisms. Individuals who have a more secure attachment style tend not to suppress activation of the opioid system, whereas those who are insecurely attached, namely dismissive, actively engage in the suppression of the opioid system. This is a function of their lack of interpersonal engagement more than it is a conscious deactivation of the system. This could explain the opposing results in study two that those who are more secure receive better treatment efficacy on the BSI. Conversely, those who are more preoccupied in their attachment style do not fare as well in post-treatment BSI scores, this could be a result

of their inability to fully engage with the activation of the opioid system. Whilst these points are speculation, further research could be conducted in order to test these findings. A study by Zilber, Goldstein, and Mikulincer (2007) used an event related potential (ERP) paradigm whereby participants would respond to three sets of twenty pictures; pleasant, neutral and unpleasant. It was found that individuals with different attachment styles processed these stimuli differently, suggesting that attachment modulated the brains responses to emotional stimuli. If this paradigm were utilised using a repeated measures design with counterbalanced time points of; receiving acupuncture and not-receiving acupuncture, it would be expected that the modulation effect of attachment might be impacted by the presence of acupuncture needles, further supporting the opioid theory.

Insecure attachment has been linked to increased instances of MUS (Ciechanowski et al., 2002; Taylor et al., 2000; Taylor et al., 2012), it may therefore be assumed that those presenting with a MUS diagnosis may have their treatment efficacy moderated by their attachment style. Several moderation analyses were undertaken comparing those with and without a MUS diagnosis. Moderations revealed that fearful attachment moderated the MUS non-diagnosed group but not the MUS group. This finding suggests that the ability for fearful attachment to moderate outcomes on the GHQ is potentially impacted by the presence of a MUS diagnosis. For those without a diagnosis, higher fearful attachment resulted in greater treatment efficacy, this could indicate that acupuncture may protect non-MUS patients against psychological distress symptoms associated with attachment insecurity. Previous research has shown associations between higher levels of fearful attachment with a reduction in opioid function (Machin & Dunbar, 2011). If acupuncture treatment elicits the release of opioids, this could explain the subsequent opposite effect being observed in this study. It could also explain the lack of moderation effect seen in the MUS diagnosed group as the presence of an MUS diagnosis has been associated with elevated insecure attachment styles (Kolb, 1982; Stuart & Noyes Jr, 1999; Waldinger et al., 2006), acupuncture may have neutralised this effect through the elicitation of endogenous opioids. It is important to note that implications of causation are to be treated tentatively with regards to study two

findings in relation to opioid elicitation, further research must be conducted in order to identify the causal links in the hypothesised links mentioned here. Preoccupied attachment revealed a different pattern, whereby those with a MUS diagnosis and higher scores on the preoccupied scale received greater treatment benefits, compared to those without a MUS diagnosis. This suggests that unlike fearful attachment, acupunctures protective effect was present in those with a MUS diagnosis with higher preoccupied attachment levels. Dismissive attachment levels moderated those without a MUS diagnosis but not those with. However, the moderation effect only favoured those who's pre-treatment GHQ scores were above 15. Participants who presented with scores greater than 15 would receive a benefit from having higher scores in dismissive attachment. On the contrary, scores below 15 resulted in higher dismissive scores negatively impacting treatment outcomes on the GHQ (see 4.3.1.6). This finding is supported by the disorganised nature of a dismissive attachment style and previous research (Carvallo & Gabriel, 2006). This research suggests that despite a lack of optimum psycho-social functioning induced by a dismissive individual's deactivation of the attachment system, this same deactivation may protect against psychological distress and other stressors to a certain extent. This may be why acupunctures efficacy is diminished until a certain level of psychological distress is observed.

For somatised distress (BSI) results showed that secure attachment moderated post-treatment outcomes suggesting that higher secure attachment scores resulted in better somatic treatment efficacy. Whereas, with the preoccupied attachment score, a higher score resulted in worse post-treatment outcomes on the BSI in participants with a MUS diagnosis. This same result was found for higher levels of dismissive attachment, in that, higher scores would result in poorer treatment efficacy of acupuncture. It would seem that although the previous studies have demonstrated close links between psychological distress and somatic symptoms (Brown, 2004; Henningsen et al., 2007), the presence of a MUS diagnosis is implicated in the relationship between the attachment system and the efficacy of acupuncture to treat somatic symptoms. Secure individuals appear to have an advantage

over insecurely attached individuals in the treatment of somatic symptoms, this may be due to their ability to achieve greater levels of opioid release during acupuncture. Given that preoccupied and dismissive individuals saw a reduction in efficacy, it could be conceived that their inherent defence of engaging in deactivation of the opioid system, resulted in a worse post-treatment outcome. Further research would be required to confirm this hypothesis using either biological or neurological evidence to support these claims.

Having seen the effects of general adult attachment on treatment efficacy, it was hypothesised that the participants' attachment to the practitioner may also have an impact on treatment outcomes. Although study one showed strong evidence that insertion of the needle is what causes acupuncture's effect, it could be that a secure relationship with the practitioner furthers this effect. The results from study two however, showed that there was no moderation effect of CATS on either psychological or somatic distress. This result shows further evidence of the link between the individuals' adult attachment style and treatment outcome, as the relationship with the practitioner was not a factor in treatment efficacy. Therefore, the hypothesis that there would be no significant moderation of post-treatment scores on either the GHQ or BSI by participants' attachment to therapist can be accepted. However, it could be that those with or without a MUS diagnosis required a more secure attachment to their practitioner in order to enhance acupuncture's effect. Two significant moderations were found both including the avoidant attachment to therapist, the first was MUS diagnosed individuals on GHQ outcomes. This result indicated that at higher levels of psychological distress (>20 on GHQ) a high level of avoidant attachment to the therapist resulted in worse treatment efficacy. Whereas, at lower levels of psychological distress (<20 on GHQ) a higher level of avoidant attachment resulted in better treatment efficacy. This could suggest that those with higher psychological distress form attachments with their practitioners which are lower in avoidance in order to facilitate better treatment efficacy, this is supported by the results of the general attachment. The other significant moderation came from those who did not have a MUS diagnosis, this result showed that in the treatment of somatic symptoms (BSI) treatment efficacy was enhanced with higher avoidant attachment

to the therapist. Overall these results show a conditional effect of attachment style on treatment outcome depending on if a MUS diagnosis is presented or not. With regards to the hypothesis that there would be differences in significances between moderation direction and/or significances between those who present with or without a MUS diagnosis, the hypothesis can be partially accepted as some differences were observed.

In order to confirm findings in study one where MEAQ sub-scales moderated post-treatment outcomes on the BSI, it was predicted that there would be moderation of the MEAQ on BSI outcomes but not on GHQ. The results of study two revealed that there was no moderation effect of total MEAQ score on post-treatment outcome of the GHQ meaning that this part of the hypothesis can be accepted. Conversely, on the BSI the total MEAQ score did moderate treatment efficacy with those who had higher levels of experiential avoidance receiving a diminished treatment effect. This is in line with the hypothesis and the literature that suggests that those who are higher in experiential avoidance are more likely to express somatic complaints and they are likely to be more difficult to treat (Tull et al., 2004). There is limited literature on the role of experiential avoidance (EA) on the expression of somatic distress and MUS. However, it is believed to be a logical component as existing literature does appear to have explored EA to comorbid conditions such as depression and anxiety (Berman, Wheaton, McGrath, & Abramowitz, 2010; Kashdan, Barrios, Forsyth, & Steger, 2006). Further exploration of the results reveals that only one of the sub-scales of the MEAQ significantly moderated the BSI outcomes, distraction and suppression. Once again, this ties together nicely with behaviours synonymous with insecure attachment namely fearful and avoidant predicting higher instances of somatic distress. Most interestingly, this moderation effect was only seen to be significant in those participants that presented with a MUS diagnosis. The manifestation of the MUS diagnosis may well act as a catalyst through which the experiential avoidance behaviours are reinforced, making response to treatment in those who are more active in distraction and suppression harder to treat. Very little research has explored the relationship between experiential avoidance and somatic symptoms, further research could help better understand the way in which somatic symptoms become

expressed through deeper understanding of the development of experiential avoidance and their links to both attachment style and depression and anxiety.

This study aimed to utilise measures provided by the practitioner of each clinic in order to see if aspects of the practitioners' psychopathology contributed to the efficacy of acupuncture treatment. Study one was unable to do this as only a single practitioner provided treatment to trial participants. The results from study one also suggests that irrespective of the interactions that take place between the client and practitioner, acupuncture is still effective, as communication between practitioner and participant were identical in both treatment and placebo groups. However, there could be an additional benefit of selecting a practitioner who has a general secure attachment style compared to those who are, for example dismissive. Despite this, it was predicted that there would be no moderation effect of practitioner general attachment style on either the GHQ or BSI. Results showed that there was no moderation effect of any of the four attachment dimensions on GHQ or BSI, with the exception of dismissive attachment on the BSI where higher scores resulted in greater treatment of somatic symptoms. This result was marginally significant (p = .04) and presented a very weak beta, suggesting very little actual effect of practitioner attachment on BSI scores. In addition, what these results are, to the best of the authors knowledge, the first of their kind, a sample of 5 practitioners does not offer the variance in attachment scores required to provide a more definitive result. The presence of this marginally significant result could be investigated in more detail in a larger multi-centre study. The hypothesis that there would be no significant moderation effect of practitioner attachment on GHQ and BSI outcomes is accepted. These results further refute claims that acupuncture treatment is purely placebo, as interpersonal relationship between practitioner and client has been linked with positive results in both psychological and physical therapies (Thygeson, Morrissey, & Ulstad, 2010). Research in this area has also implicated the attachment system suggesting that juxtaposition of the practitioner and patient, akin to parent and child provides a secure base from which the patient derives reassurance (Dozier, Cue, & Barnett, 1994).

As with practitioner attachment style, there is a possibility that the experiential avoidance (EA) levels of the practitioner could moderate post-treatment outcomes for patients of acupuncture. It was hypothesised that this would not be that case however, as study one revealed a significant effect of acupuncture over a placebo. This hypothesis is accepted as the total scores for the MEAQ of the practitioner did not moderated GHQ or BSI outcomes. These results further support the findings of study one that the efficacy of acupuncture is largely due to the insertion of needles and not any interpersonal relationship between the practitioner and the participant.

This study successfully reinforces primary outcome findings of study one, that acupuncture is an effective treatment for both psychological and somatic distress. Furthermore, it demonstrates this across multiple clinics in ecologically valid settings, something that has yet to be reported in the literature. Acupuncture also, does not appear to differentiate between patients with or without MUS diagnoses, but instead treats both groups with equal efficacy. In addition, this study re-highlights the endogenous opioid system as a potential mechanism of action as proposed by several researchers (Errington-Evans, 2012; Ma, 2004; Wu et al., 2012) by demonstrating links between the attachment and treatment efficacy. The findings of this study are not without their limitations, whilst the presence of endogenous opioid elicitation is theorised, this study offers no biological or neurological data to support this. In addition, results are not subject to comparison to a control group, although this was felt unnecessary given the results over placebo observed in study one. There may have also been a tendency for participants to overestimate the treatment effects received in order to please their practitioner as a form of social desirability. Once again, the results from study one, where participants were blind to the experimental groupings, would suggest that the results of this study were not liable to this type of bias. The current study also shows evidence that the role of the practitioner, in terms of their attachment style, attachment to the patient and experiential avoidance levels; does not impact the outcomes of patients. Instead, the patients' own psychopathology appears to be the leading indicator of moderation of treatment efficacy, and this should be a focus for future research.

CHAPTER 5 – DISCUSSION & CONCLUSIONS

5.1 DISCUSSION

The existence of somatic distress is not necessarily an indicator of the presence of Medically unexplained symptoms. In both studies patients who did not present with a functional syndrome (as listed in Chap. 1.1.1), still presented with some level of somatic distress. This somatic distress could have been the result of other, unmeasured, psychopathology such as work related stress (Kawano, 2008). The presentation patterns in both studies were consistent with what would be expected in the real world. Rates of presentation were similar to that expected in primary care for study one (Henningsen & Creed, 2009; Peveler et al., 1997) and secondary or tertiary care (Barsky et al., 2005; Brown, 2004; Henningsen & Creed, 2009) for study two. These presentation rates are important as they offer an additional layer of ecological validity, and support previous research regarding the prevalence of MUS. This is particularly the case for study two whereby participants of the study approached the clinic for treatment, not because of the study taking place, but because they felt that they would benefit from acupuncture treatment. Anecdotally, acupuncturists often report that a high percentage of patients turn to acupuncture after already exhausting NHS primary, secondary and tertiary care options. This is supported by Sharples et al. (2003) who's survey of 499 CAM patients revealed that the main reason for attending CAM therapy was because conventional treatment methods had not helped. This reason for attending acupuncture therapy, and the ever increasing demand for acupuncture services (WHO, 2013), gives rise to the need to study its effectiveness in the treatment of all manner is physical and psychological issues. Previous research has provided evidence of acupuncture's efficacy to treat depression (Wu et al., 2012), anxiety (Errington-Evans, 2012) and MUS (Madsen et al., 2009; Paterson et al., 2011); however, the two studies in this thesis further this knowledge by firstly comparing the effects to a placebo form of acupuncture and demonstrating an effect beyond the placebo control. Secondly, study two validates these findings in an ecologically valid setting with multiple practitioners across five clinics. The use of a non-penetrating sham control for acupuncture for study one may be considered a controversial choice, this type of sham acupuncture has received criticism as there is

evidence that it elicits a therapeutic effect on its own (Appleyard, Lundeberg, & Robinson, 2014), thus not technically full a placebo. This could have watered down the effects of the placebo as the sham-acupuncture needle could have provided some clinical effect. This would therefore result in the findings of study 1 not being acupuncture vs. a true physiologically inert placebo but instead vs. a mild form of treatment. This, in turn, would actually serve to strengthen the results of this study, providing stronger evidence of acupuncture therapy in the treatment of MUS. Supporting this, a meta-analysis by MacPherson et al. (2014) indicates that the Park Sham control, used in study one, provided the largest effect size for acupuncture efficacy and is therefore the most logical choice for use as a placebo control when attempting to blind participants and practitioners.

Prior to the two studies conducted in this thesis, studies involving cognitive behavioural therapy (CBT) provided the greatest treatment effect for those suffering with MUS (Kroenke, 2007; Price, 2009; Schroder et al., 2012; Zijdenbos, 2008). Many of these pieces of research are reviews whereby multiple clinical trials are evaluated, no such review has been conducted for acupuncture in the treatment of MUS due to a lack of clinical trials being published. The efficacy of CBT to treat MUS was measured using a number of outcomes, however, one study utilised identical measures to the studies of this thesis. A study by Sumathipala et al. (2000) utilised both the GHQ and BSI in a study comparing CBT treatment to usual care for MUS, their results revealed an average difference between control and treatment of four points on the GHQ and two points on the BSI. Conversely, study one showed a difference of five points on the GHQ and thirteen points on the BSI compared to the placebo control. These findings appear to indicate that acupuncture may be a more feasible treatment approach for sufferers of MUS, particularly when it comes to the treatment of the physical symptoms. One important consideration for recommending a treatment for a particular condition is the associated cost, this is predominantly the case in countries that have a NHS, like the United Kingdom[7]. Previous research has shown

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[7] This refers to any country that has a publicly funded social health care system. E.G. Norway, Germany, New Zealand etc.

evidence that acupuncture is both cost effective and an effective treatment for chronic headache (Wonderling, Vickers, Grieve, & McCarney, 2004), persistent low back pain (Ratcliffe, Thomas, MacPherson, & Brazier, 2006; Witt et al., 2006) and chronic neck pain (Willich et al., 2006). Given that each of these pieces of research investigates a syndrome that could be considered a MUS, it could be that acupuncture is a cost effective treatment for all MUS; however, further research would need to be conducted to confirm this hypothesis. If it is found that acupuncture is a cost-effective treatment it could help in the reduction of current costs of multiple GP visits, referrals and diagnostic tests and patients who are either not responsive or not engaging with other therapies, such as CBT. Overall, the findings of both studies suggest that acupuncture is a powerful treatment of both psychological and somatic distress. However, these results to not provide any information about how acupuncture achieves this effect.

The attachment system has been implicated in many areas that overlap with the expression of somatic distress and MUS, for instance pain. Studies that show that more securely attached individuals endure greater levels of pain (Meredith, Strong, & Feeney, 2006a), provide evidence that there is a link between our social interactions and our physical sensations. This has been further explained by a neuroendocrine and neurological mechanism triggering the activation of the endogenous opioid system (MacDonald & Leary, 2005; Machin & Dunbar, 2011), this same activation is responsible for supressing both physical (Holden et al., 2005) and social pain (MacDonald & Leary, 2005). Whilst the studies of this thesis did not collect biological data in order to evidence the activation of the opioid system during acupuncture, results showed that treatment efficacy was moderated by attachment style. Study one demonstrated that this moderation effect differed in its presence between placebo and genuine acupuncture groups whereby attachment security moderated somatic symptom scores on the treatment group but not in the placebo group. This is supported by research that suggests that the insertion of an acupuncture needle elicits an endogenous opioid response (Ma, 2004) and evidence that those with a secure attachment style engage with appropriate engagement of the opioid system (Carvallo & Gabriel, 2006).

Study one provides evidence that the link between acupuncture and improvement in somatic symptoms is subject to a moderation effect of attachment style, in addition, it shows that this effect is only present when the needle penetrates the skin. Study two further supports this finding by demonstrating the existence of this moderation effect in a multi-centre study. These results are novel and indicate a potential mechanism by which acupuncture achieves its efficacy in the treatment of somatic symptoms. It is believed that the mechanism by which the activation of the endogenous opioid system achieves its therapeutic effect with patients with MUS is, by offering a mild but clinically significant analgesic effect, this effect is not permanent but offers a window of opportunity for the patients' body to self-regulate and offers space for new habits to develop which may address the predisposing and precipitating factors of MUS. However, further investigation should be undertaken to further confirm this link, future research could employ the use of Event Related Potential (ERP) (See. Chap. 4.4) in order to examine how reactions vary between different attachment styles with the presence and absence of acupuncture needles to various images (positive, negative or neutral). Research has already shown that different adult attachment styles result in differences in brain response to certain images, it could be assumed that if acupuncture is moderated by attachment, then the presence of acupuncture may impact the attachment response. Such trials would be far easier to implement compared to studies that attempt to measure cerebral spinal fluid, which is the only truly accurate measure of endogenous opioid activation.

Interestingly, results of both studies showed evidence that irrespective of a MUS diagnosis treatment efficacy remains the same. This result shows that acupuncture does not appear to bias against those presenting with a MUS diagnosis. Further analysis revealed in study two that there are instances whereby attachment style would moderate post-treatment outcomes in those without a MUS diagnosis compared to those with. In the treatment of psychological symptoms (GHQ) greater levels of fearful attachment resulted in better outcomes for those without a MUS diagnosis, where those with a diagnosis were not impacted by their level of fearful attachment. Whereas greater levels of preoccupied attachment resulted in greater

treatment efficacy for participants with a MUS diagnosis on GHQ scores, but did not impact those without a MUS diagnosis. The dismissive style for those without a MUS diagnosis revealed a polarised moderation whereby higher GHQ scores resulted in a positive outcome for those higher in dismissive attachment and a worse outcome for lower GHQ scores. The literature suggests that the presentation of MUS is associated with higher rates of insecure attachment (fearful, preoccupied and dismissive) (Kolb, 1982; Stuart & Noyes Jr, 1999; Waldinger et al., 2006), however, the literature has yet to explore the differences between groups of participants who present with MUS and those who do not as a function of their attachment style. That is, does attachment impact treatment differently depending on the type of problem you present with, studies one and two suggest that with acupuncture, this is the case. This is likely to be due to a number of reasons firstly, whilst the presence of a MUS diagnosis is associated with higher levels of attachment insecurity there is no causal link, meaning individuals that do not have a MUS diagnosis may also have high levels of insecurity. In addition, whilst there are many MUSs that exist, not all patients will fall into one of these categories with their presentation of symptoms. One limitation of the studies of this thesis is that they do not use participants that have been assessed as officially medically unexplained by a general practitioner, this means that data is reliant on participant self-report and could be subject to lack of or exaggeration of diagnoses. However, collecting a general population sample and not excluding individuals that reported no MUS diagnosis has allowed for interesting comparison of their results which would have not otherwise been possible. Future studies may find benefit in excluding patients without an MUS diagnosis in order to isolate attachment effects of treatment efficacy.

Whilst adult attachment provides a picture of the participants' general attachment style, it does not provide any information about the relationship that has been forged between the practitioner and the patient. Research in the area of psychotherapy explores this attachment between client and therapist in order to understand the strength and quality of the therapeutic alliance and subsequent improvement of symptoms. Evidence suggests that a more secure client to therapist attachment is more conducive to a clinical reduction in

symptoms (Mallinckrodt et al., 1995; Mallinckrodt et al., 2005). Therefore, it was hypothesised that because the attachment system was implicated in the efficacy of acupuncture treatment (as with psychotherapy), so too may the relationship between practitioner and patient. Results of study one showed that in the placebo group, attachment security between practitioner and patient moderated treatment outcomes of both the BSI and GHQ. However, this was not the case for the treatment group, this finding indicates that the application of genuine acupuncture treatment removes any moderating effect of patients' secure attachment to practitioner, this finding is validated by study two, who's results were the same, further strengthening the evidence for the opioid theory. Additional results showed that those with higher levels of fearful attachment to the practitioner fared worse in genuine acupuncture treatment, this indicates that when a patient has a higher level of fearful attachment with a practitioner, he/she is likely to receive lower treatment efficacy for somatic symptoms. The results of both studies suggest that attachment insecurity with the practitioner could result in inhibited treatment efficacy, these finding support the literature in psychotherapy who find similar results. Study two compared moderation effects of patient attachment to practitioner between those with and those without a MUS diagnosis. It was seen that there was no difference in moderation effects of secure attachment between the two groups of participants on either the BSI or GHQ. These findings suggest that attachment to the practitioner has a limited capacity to impact post-treatment outcomes in acupuncture treatment. The significance of the fearful attachment moderation in the treatment group of study one would suggest that if a fearful attachment is formed between practitioner and patient, there is the potential for treatment efficacy to be inhibited. This is something that could be managed by offering additional training to acupuncturists in how to manage this relationship in order to maximise treatment outcomes. An important note here, is that whilst results were significant, they do not always represent a meaningful clinical effect. That is, with such low beta values from the interaction terms, it would require a huge increase in fearful attachment to diminish treatment efficacy to the point where it would be clinically relevant. The moderation analyses undertaken in both studies represent subtle effects that

are calculated across minute changes in attachment to the practitioner scores and whilst statistically significant may be misinterpreted as clinically significant.

It may be possible that, although the relationship between the patient and practitioner has a limited impact on treatment outcomes in acupuncture, aspects of the practitioners' psychopathology may impact treatment. This was tested in study two where practitioners completed measures of general attachment and experiential avoidance. Moderation results revealed that, with the exception of dismissive attachment, there was no moderation effect of attachment or MEAQ on treatment outcomes of either the GHQ or BSI. These results support the findings of study one, in that, the effect of acupuncture is a result of the penetration of the needle and not the interaction between patient and practitioner. The single significance of dismissive attachment revealed a very weak effect and may be the result of a type one error. A post-hoc Bonferroni correction of the marginally significant moderation would render the finding non-significant.

Experiential avoidance has a limited evidence base when it comes to its links with somatic symptoms and MUS (See Chap.1.3). Study one provided evidence of positive associations between experiential avoidance and both psychological and somatic distress, this supports limited existing evidence (Palm & Follette, 2011; Tull et al., 2004). Much of the research literature surrounding experiential avoidance focuses on post-traumatic stress disorder or early childhood trauma, however, this association from a general population sample suggests that the nuances of experiential avoidance may be involved in the presentation of psychological and somatic distress and MUSs, in isolation of PTSD. In both study one and two evidence of the moderation effect of experiential avoidance was found only on somatic symptoms. In both cases greater levels of experiential avoidance resulted in poorer treatment outcomes. Study two, due to a higher number of participants was able to show that the MEAQ sub-scale of distraction and suppression was the only sub-scale of the MEAQ to significantly moderate BSI outcomes. This indicates that distracting and supressing unpleasant experiences and emotions impacts the treatment efficacy of acupuncture. This

finding supports research conducted by Berking, Neacsiu, Comtois, and Linehan (2009) who found that there was an association between higher experiential avoidance levels and a decrease in treatment efficacy of dialectical behavioural therapy (DBT[8]) for borderline personality disorder. Study two also allowed for exploration between those who were and were not diagnosed with MUS, results showed that there were no significant moderation effects of experiential avoidance on BSI outcomes.

5.2 ORIGINAL CONTRIBUTION TO KNOWLEDGE

Literature searches have revealed a distinct lack of evidence of the efficacy of acupuncture in the treatment of MUS (see Chapter 1.4.1). The single previous study that was found was shown to be methodologically weak and findings were not considered gold standard (Cockram, 2011; Colquhoun, 2011; Devroey & Van De Vijver, 2011; Farrimond, 2011; Lawson, 2011; McCartney, 2011; Meijer & Verwoerd, 2011; Paterson et al., 2011; Power & Hopayian, 2011; Rose, 2011; Wallace, 2011). Study 1 of this thesis directly addresses the methodological flaws of the Paterson et al. (2011) study. Initially, by providing the first known evidence of acupunctures efficacy against placebo for the treatment of psychological and somatic distress. This study also shows the first evidence of a sustained effect of acupuncture over placebo at follow-up which is also entirely novel in the study of acupuncture to treat MUS. Besides the primary outcomes of study 1, secondary outcomes which investigated the role of psychological attachment, clients' attachment to the therapist, and experiential avoidance showed further novel findings. The study showed that attachment style moderated the treatment outcome of acupuncture treatment, this had been previously published (Sochos & Bennett, 2016) but study 1 provides these results in the context of a controlled experiment.

Study one uncovered findings that were not primary or secondary aims of this thesis, but still represent a significant contribution to knowledge. Firstly, it was seen that the placebo group

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[8] DBT is a form of CBT intended for the treatment of borderline personality disorder (BPD). The approach accounts for the potential of individuals with BPD to have large variations in their emotions.

still received a significant clinical effect on both the GHQ and BSI, which may support the reattribution approach used by CBT therapists for MUS (Morriss et al., 2007; Morriss et al., 2006). Confirmation of this finding would require further research whereby the consultation process of acupuncture is modified to remove the similarity to reattribution, this group could then be compared to the placebo acupuncture group as in study one. It would then be predicted that there would be a significant different between the treatment outcomes of the placebo group and the modified consultation group. Secondly, study one also revealed that dismissive attachment moderates the placebo effect in that higher levels of dismissive attachment result in better placebo effect outcomes. No previous research has investigated the role of attachment style in the placebo effect, these are the first empirical findings that demonstrate that a person reacts differently to a placebo treatment based on their attachment style. This has major implications for attachment theory as it confirms that hypothesis that attachment is an unconscious process in the mind. In study 1 participant and practitioner were blind to the treatment being given and therefore the reaction of the dismissive individual was purely neurological and pre-/sub-conscious. A literature search conducted on 07/06/2016 yielded no relevant results when searching for "dismissive" and/or "attachment" and "placebo" and/or "effect" in the MEDLINE and CINAHL databases. However, one theoretical publication posits the potential for a link between attachment and the placebo response (Kradin, 2011).

These contributions to knowledge will form the basis of a minimum of two papers that will be submitted to peer reviewed journals for publication. One will focus on the efficacy of acupuncture for the treatment of MUS and include data from study 1 & 2, it will cover the suspected role of the endogenous opioid system and the role of attachment in this relationship. The second will focus on the findings that attachment style moderates the intensity of the placebo effect and will likely be a shorter paper that might spark further investigation with analogous placebos being used to see if the effect is present in all placebo treatments (E.G. sugar pill).

5.3 LIMITATIONS

No research is without its limitations, one major limitation of this thesis is its lack of acknowledgement of the potential non-specific effects of the placebo treatment given in study 1. A meta-analysis undertaken by Linde, Niemann, Schneider, and Meissner (2010) shows evidence that non-specific effects, those which are believed to be "effects which are associated with the incidental elements of an intervention" (pp. 75). This could be the consultation part of the treatment, the physical touch element of palpation by the practitioner during the consultation etc. This means that all treatments, alternative or otherwise, will be comprised of both a specific (the active component of the treatment) and non-specific component. Both studies in this thesis do not take account of this. Therefore, the positive treatment effects seen in the placebo group in study 1 could be a result of, additional, non-specific effects brought about by other elements of the traditional Chinese medicine approach. Further investigation in to these non-specific effects is something that is important to fully understand the therapy that is being delivered to patients and exactly to what extent the penetration of the needle contributes to this effect. As outlined by (Langevin et al., 2011) very careful research design is required to unwrap the different effect types so they can be observed in isolation in order to demonstrate causal relationships.

This thesis, because of its aims and philosophical approach, doesn't take in to account the experiences or opinions of the participants. This is an inherent weakness of all quantitative research, it could be for instance that although a participant didn't see a statistical increase in either their GHQ or BSI scores, they could have had improved sleep, or noticed an ache or a pain disappear that isn't covered by one of those measures. A mixed methods approach, which incorporates both quantitative and qualitative methods would have provided a great deal more depth and breadth of data compared to that which was gathered by using quantitative methods alone.

In both studies the same operational definition of MUS was used, this was done for purely pragmatic reasons. As explained in Chapter 1.1.1, it was no feasible to utilise the services of

a general practitioner, psychiatrist or otherwise for the purposes of these studies. One weakness with the operational definition of MUS that was used is that it relies on self-report on the part of the participant. This could be open to both overreporting (claiming they have one of the diagnoses when they do not) and underreporting of symptoms. This could occur for a number of reasons. For examples, participants might be concerned that they would be excluded from the study if they did/did not report being diagnosed with one of the syndromes, and in the case of study 1, this would have resulted in them not receiving 5 free acupuncture sessions. They may also have genuinely forgotten or may not entirely understand their diagnoses and therefore have incorrectly self-reported. It is my belief that in reality this did not in actual fact impact the results of the study. The reason for this is that the population of both study 1 and 2 that reported a MUS diagnosis was very similar to the numbers that would be expected to appear in secondary care. For example, in study 1, 66% of participants reported suffering with one or more of the MUS diagnoses. In study two this was higher where 72% of participants reported one or more MUS diagnosis. Research suggests that anywhere upward of 50% of patients in secondary care present with MUS (Barsky et al., 2005; Brown, 2004; Bystritsky et al., 2012; Henningsen & Creed, 2009; Reid et al., 2002; Speckens et al., 1995; Stewart & O'Dowd, 2002). It was not possible to locate any research that specifically investigated prevalence of MUS in CAM therapy. Study 2 therefore potentially provides some of the first evidence of how high MUS are in CAM therapies, namely acupuncture. Future research could further this by having patients blind assessed by a GP, psychiatrist, psychology or other qualified healthcare professional. For the aims and hypotheses of the two studies in this thesis it is believed that the operational definition of MUS was appropriate and resulted in an expected, representative population being present in both studies.

Clinical data, which is data that the acupuncturist would normally collect for their own records relating to the diagnosis given, answers to specific questions, information about the tongue and pulse picture, were not recorded in either study 1 or 2. The absence of this information, is not detrimental to either of the findings of the studies, but does result in a lack

of depth of information. For instance, it could be that certain acupuncture points or combination of points could be beneficial for treatment of a particular MUS over another. This level of data is lost by not recording this information and adding it to the analysis. The primary aim of these studies was to assess and validate any clinical efficacy of acupuncture for the treatment of MUS, not to assess which points were most effective. In addition, as treatment followed the holistic principals of TCM, no two treatments were the same, meaning that if points were recorded this would have significantly increase the workload of the practitioners taking part in the trial. Whilst future research should certainly focus on recording details of needling as recommended by Standards for Reporting Interventions in Clinical Trials of Acupuncture (STRICTA) (MacPherson et al., 2010; MacPherson et al., 2002), it is imperative that the holistic principals are not sacrificed in order to attempt to force this, or any other form of CAM in to a scientific paradigm in which it does not and will not fit. The recording of needling and other relevant clinical data by practitioners can help improve the training that is provided to new practitioners whilst informing those who are already in practice to ensure they are delivering treatment from an evidence base. It could also aid in clarifying mechanisms by which acupuncture operates, contributing to the current limited but developing body of knowledge in this area.

5.4 CONCLUSIONS

In conclusion this thesis provides strong evidence for the efficacy of acupuncture the in treatment of psychological and somatic distress and MUS. It introduces the first known links between acupuncture, attachment and experiential avoidance, and provides additional supporting evidence of the potential presence of opioid elicitation in acupuncture therapy. This thesis also provides evidence of the isolation of the penetration of the needle in acupuncture effect and shows limited scope that practitioner psychopathology impacts treatment outcomes. These findings could help to inform patient choice and direct treatment protocols for sufferers of MUS who are currently over utilising primary and secondary care,

offering a potential saving to the current estimated £3.1 billion NHS spending for patients who are medically unexplained. If patients are aware that there is an effective treatment for MUS they can choose to take it, in this case acupuncture. They also uncover previously un-researched associations such as the ability for attachment to moderate the placebo effect. To support acupuncture's use for MUS future research should focus on four main areas; first, deepening the understanding of the bio- and neurological mechanisms that underpins acupuncture efficacy. Second, exploring in more detail the role other psychological constructs may influence in the expression and subsequent treatment of psychological and somatic distress and MUS, such as alexithymia. Thirdly, further, larger scale placebo controlled trials using a clinical sample in order to validate the findings of this study. Lastly, assessing the potential for cost saving of early referral to acupuncture treatment compared to CBT or usual care (multiple secondary care referrals). Despite the culmination of this thesis, patients who are suffering with MUS are currently dissatisfied and have limited treatment options available to them. Primary care trusts currently rate the issue of MUS as a priority both due to the wellbeing of the patient and the increasing cost implication. Until such time as an alternative suitable therapy is found and implemented, research should continue to investigate more therapeutically intense and cost-effective forms of treatment (Burton et al., 2012).

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APPENDICIES

Consent form for participation in Traditional Chinese Medicine Randomised Control Trial

This research trial is to help better understand how effective Traditional Chinese Medicine is at treating individuals' health problems. The research is conducted in the Psychology Department, University of Bedfordshire with the approval of the Research Centre for Applied Psychology and University Ethics Committee.

By signing this form you are consenting to take part in a 5 week trial. This trial consists of receiving 5 free treatments of either true Traditional Chinese Acupuncture or placebo acupuncture. Placebo acupuncture will appear to both you and the practitioner as real acupuncture however the needle will not penetrate the skin and there will be no effect from the treatment. It will be as if you have had no treatment. You will not be told which condition you have been assigned to until after the trial is completed, in addition your practitioner will not be aware of which condition you are in, this is so the results can in no way be influenced and to test if real acupuncture can perform better than a placebo alone.

If you are in the placebo group you will offered 5 free treatments of real acupuncture at the end of the trial, with one of the practitioners involved in the trial.

Once you have signed this form your first appointment will be made. The trial lasts a total of 5 weeks (1 appointment per week) with a follow up questionnaire after 3 months from today. During the trial if you are unable to attend your scheduled appointment please contact your practitioner either by phone or email (details provided), if you miss more than two weeks, increasing your trial beyond a total of 6 weeks your data will not be able to be included and your appointments will stop. Equally you may not take your five acupuncture sessions within one week; the shortest time in which the trial may be completed is 4 weeks.

To protect your data and your anonymity, please do not write your name anywhere on the questionnaire itself. Please fill in your name on this sheet where indicated, detach this sheet from the questionnaire itself, and give both coversheet and questionnaire to the researcher (or practitioner). All information you provide will be treated with the strictest confidence and will only be reduced to numbers for statistical analysis. Throughout the analysis, your data will be identified via a code (top right) so that anonymity of the data is preserved.

If you wish to withdraw from the trial you may do so at any time, even if you have already completed part of the whole questionnaire or treatments. If you wish to withdraw, require further information, or are interested in the findings of the study, feel free to email Ashley Bennett on ashley.bennett@beds.ac.uk or Dr. Antigonos Sochos on antigonos.sochos@beds.ac.uk, tel: 01234 400 400.

If you feel like you would like to talk to someone in confidence about something raised during participation in this trial please ask for more information.

We thank you greatly for your participation in this trial.

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First Name *(Please print)*:_____

Surname *(Please print)*:_____

I agree for data collected in the following questionnaires to be used as part of the study.

Signed:_____

Appointment Schedule:

Date	Time	Practitioner	Completed

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<u>Part I Background Information</u>

Age:_____

Gender (Please Circle):   M   F

Ethnicity: White [ ]   Bangladeshi [ ]   Pakistani [ ]   Indian [ ]   Chinese [ ]

Black African [ ]   Black Caribbean [ ]   Other ....   Mixed Ethnicity ....

Please fill in the following questions to the best of your knowledge.

1. **What problem brings you to the clinic today?**_____

2. **How many times have you visited a health professional (western medicine eg. GP,**

Nurse, Consultant) for this problem in the last six months _____

3. **Was a western diagnosis given**: Yes [ ]   No [ ]

4. **If yes, what was the diagnosis given?**_____

5. **How successful has the western treatment been during that period (of six**

months): [*Please circle*]

Very Successful   Successful   Neither Successful/Unsuccessful   Unsuccessful   Very Unsuccessful

6. **How many times have you visited a health professional for any problem other than the**

current in the past six months _____

7. Have you <u>ever</u> been given the following diagnoses:

Irritable bowel syndrome [ ]   Pelvic pain [ ]   A psychiatric diagnosis [ ]

Fibromyalgia [ ]   Fibrositis [ ]   Low back pain [ ]

Chronic back pain [ ]   Tension headache [ ]   Chronic headaches [ ]

Atypical facial pain [ ]   Chronic fatigue (ME) [ ]   Palpitations [ ]

Post-viral fatigue syndrome [ ]   Non-cardiac chest pain [ ]

Non-ulcer dyspepsia [ ]   Dizziness [ ]   Insomnia [ ]

Mitral Valve Prolapse [ ]   Multiple Chemical Sensitivity [ ]   Globus [ ]

Sick Building Syndrome [ ]   Repetitive Strain Injury [ ]

Chronic Whiplash [ ]   Hyperventilation Syndrome [ ]

Pre-menstrual Syndrome [ ]   Vocal Cord Dysfunction [ ]

Temporomandibular Joint Disorder [ ]

8. If yes, how long ago? _____

Part II

We would like to know how your health has been in general over **the last few weeks.** Please circle the response that best applies to you.

1. **Been able to concentrate on what you're doing?**	better than usual	same as usual	less than usual	much less than usual
2. **Lost much sleep over worry?**	not at all	no more than usual	rather more than usual	much more than usual
3. **Felt that you are playing a useful part in things?**	more so than usual	same as usual	less so than usual	much less than usual
4. **Felt capable of making decisions about things?**	more so than usual	same as usual	less than usual	much less than usual
5. **Felt constantly under strain?**	not at all	no more than usual	rather more than usual	much more than usual
6. **Felt you couldn't overcome your difficulties?**	not at all	no more than usual	rather more than usual	much more than usual
7. **Been able to enjoy your normal day activities?**	more so than usual	same as usual	less so than usual	much less than usual
8. **Been able to face up to your problems?**	more so than usual	same as usual	less than usual	much less than usual
9. **Been feeling unhappy or depressed?**	not at all	no more than usual	rather more than usual	much more than usual
10. **Been losing confidence in yourself?**	not at all	no more than usual	rather more than usual	much more than usual
11. **Been thinking of yourself as a worthless person?**	not at all	no more than usual	rather more than usual	much more than usual
12. **Been feeling reasonably happy, all things considered?**	more so than usual	same as usual	less so than usual	much less than usual

Part III

How much have you been suffering with the following in the **past 2 weeks**: *(Please circle)*

1) Severe Headaches	Not at all	A little	Somewhat	Quite a lot	Extremely
2) Fluttering or movement in your stomach	Not at all	A little	Somewhat	Quite a lot	Extremely
3) Pain / tension in neck and shoulders	Not at all	A little	Somewhat	Quite a lot	Extremely
4) Burning / itching skin all over	Not at all	A little	Somewhat	Quite a lot	Extremely
5) Constriction of your head as if it was being gripped tightly from outside	Not at all	A little	Somewhat	Quite a lot	Extremely
6) Pain in the chest or heart	Not at all	A little	Somewhat	Quite a lot	Extremely
7) Mouth or throat feeling dry	Not at all	A little	Somewhat	Quite a lot	Extremely
8) Darkness or mist in front of your eyes	Not at all	A little	Somewhat	Quite a lot	Extremely
9) A burning sensation in your stomach	Not at all	A little	Somewhat	Quite a lot	Extremely
10) A lack of energy (weakness) much of the time	Not at all	A little	Somewhat	Quite a lot	Extremely
11) Head feeling hot or burning	Not at all	A little	Somewhat	Quite a lot	Extremely
12) Sweating a lot	Not at all	A little	Somewhat	Quite a lot	Extremely
13) Pressure or tightness on your chest or heart	Not at all	A little	Somewhat	Quite a lot	Extremely
14) Suffering ache or discomfort in the abdomen	Not at all	A little	Somewhat	Quite a lot	Extremely
15) A choking sensation in your throat	Not at all	A little	Somewhat	Quite a lot	Extremely
16) Hands or feet had pins and needles or gone numb	Not at all	A little	Somewhat	Quite a lot	Extremely
17) Felt aches or pains all over the body	Not at all	A little	Somewhat	Quite a lot	Extremely
18) A feeling of heat inside your body	Not at all	A little	Somewhat	Quite a lot	Extremely
19) Palpitations (heart pounding)	Not at all	A little	Somewhat	Quite a lot	Extremely
20) Pain or burning in your eyes	Not at all	A little	Somewhat	Quite a lot	Extremely
21) Indigestion	Not at all	A little	Somewhat	Quite a lot	Extremely
22) Trembling or shaking	Not at all	A little	Somewhat	Quite a lot	Extremely
23) Passing urine more frequently	Not at all	A little	Somewhat	Quite a lot	Extremely

24) Low back trouble	Not at all	A little	Somewhat	Quite a lot	Extremely
25) Stomach feeling swollen or bloated	Not at all	A little	Somewhat	Quite a lot	Extremely
26) Head feeling heavy	Not at all	A little	Somewhat	Quite a lot	Extremely
27) Feeling tired, even when you are not working	Not at all	A little	Somewhat	Quite a lot	Extremely
28) Pain in your legs	Not at all	A little	Somewhat	Quite a lot	Extremely
29) Feeling sick in the stomach (nausea)	Not at all	A little	Somewhat	Quite a lot	Extremely
30) Pressure inside your head as if your head was going to burst	Not at all	A little	Somewhat	Quite a lot	Extremely
31) Difficulty in breathing, even when resting	Not at all	A little	Somewhat	Quite a lot	Extremely
32) Tingling (pins and needles) all over the body	Not at all	A little	Somewhat	Quite a lot	Extremely
33) Constipation	Not at all	A little	Somewhat	Quite a lot	Extremely
34) Wanting to open your bowels (go to the toilet) more often than usual	Not at all	A little	Somewhat	Quite a lot	Extremely
35) Sweaty palms	Not at all	A little	Somewhat	Quite a lot	Extremely
36) Difficulty in swallowing, as if there was a lump in your throat	Not at all	A little	Somewhat	Quite a lot	Extremely
37) Feeling giddy or dizzy	Not at all	A little	Somewhat	Quite a lot	Extremely
38) A bitter taste in your mouth	Not at all	A little	Somewhat	Quite a lot	Extremely
39) Whole body feeing heavy	Not at all	A little	Somewhat	Quite a lot	Extremely
40) Burning sensation when passing urine	Not at all	A little	Somewhat	Quite a lot	Extremely
41) A buzzing noise in your ears or head	Not at all	A little	Somewhat	Quite a lot	Extremely
42) The feeling of a weak or sinking heart	Not at all	A little	Somewhat	Quite a lot	Extremely
43) Excessive wind (gas) or belching	Not at all	A little	Somewhat	Quite a lot	Extremely
44) Hands or feet feeling cold	Not at all	A little	Somewhat	Quite a lot	Extremely
MEN ONLY					
45) Difficulty getting full erection	Not at all	A little	Somewhat	Quite a lot	Extremely
46) Passing semen in your urine	Not at all	A little	Somewhat	Quite a lot	Extremely

Questionnaire Part IV

Please rate each paragraph according to the *extent* to which you think each corresponds to your general relationship style.

A. It is easy for me to become emotionally close to others. I am comfortable depending on them and having them depend on me. I don't worry about being alone or having others not accept me.

Not at all like me			Somewhat like me			Very much like me
1	2	3	4	5	6	7

B. I am uncomfortable getting close to others. I want emotionally close relationships, but I find it difficult to trust others completely, or to depend on them. I worry that I will be hurt if I allow myself to become too close to others.

Not at all like me			Somewhat like me			Very much like me
1	2	3	4	5	6	7

C. I want to be completely emotionally intimate with others, but I often find that others are reluctant to get as close as I would like. I am uncomfortable being without close relationships, but I sometimes worry that others don't value me as much as I value them.

Not at all like me			Somewhat like me			Very much like me
1	2	3	4	5	6	7

D. I am comfortable without close emotional relationships, It is very important to me to feel independent and self-sufficient, and I prefer not to depend on others or have others depend on me.

Not at all like me			Somewhat like me			Very much like me
1	2	3	4	5	6	7

Please indicate the extent to which you agree or disagree with each of the following statements

1	2	3	4	5	6
strongly disagree	moderately disagree	slightly disagree	slightly agree	moderately agree	strongly agree

2. If I could magically remove all of my painful memories, I would ………………………... 1 2 3 | 4 5 6

3. When something upsetting comes up, I try very hard to stop thinking about it …………... 1 2 3 | 4 5 6

4. I sometimes have difficulty identifying how I feel …………………………………….... 1 2 3 | 4 5 6

7. Happiness means never feeling any pain or disappointment …………………………… 1 2 3 | 4 5 6

9. When negative thoughts come up, I try to fill my head with something else ……………... 1 2 3 | 4 5 6

10. At times, people have told me I'm in denial ……………………………………………. 1 2 3 | 4 5 6

13. When I am hurting, I would do anything to feel better ...……………………………….. 1 2 3 | 4 5 6

15. I usually try to distract myself when I feel something painful ………………………….. 1 2 3 | 4 5 6

16. I am able to "turn off" my emotions when I don't want to feel …………………………. 1 2 3 | 4 5 6

19. Happiness involves getting rid of negative thoughts …………………………………… 1 2 3 | 4 5 6

21. I don't realize I'm anxious until other people tell me ………………………………….. 1 2 3 | 4 5 6

22. When upsetting memories come up, I try to focus on other things ……………………... 1 2 3 | 4 5 6

23. I am in touch with my emotions ………………………………………………………... 1 2 3 | 4 5 6

25. One of my big goals is to be free from painful emotions ……………………………….. 1 2 3 | 4 5 6

27. I work hard to keep out upsetting feelings …………………………………………….. 1 2 3 | 4 5 6

28. People have said that I don't own up to my problems …………………………………… 1 2 3 | 4 5 6

31. I'd do anything to feel less stressed …………………………………………………….. 1 2 3 | 4 5 6

33. When unpleasant memories come to me, I try to put them out of my mind ……………… 1 2 3 | 4 5 6

34. In this day and age people should not have to suffer …………………………………... 1 2 3 | 4 5 6

35. Others have told me that I suppress my feelings ………………………………………. 1 2 3 | 4 5 6

38. My life would be great if I never felt anxious ………………………………………….. 1 2 3 | 4 5 6

40. When a negative thought comes up, I immediately try to think of something else ………. 1 2 3 | 4 5 6

41. It's hard for me to know what I'm feeling ……………………………………………... 1 2 3 | 4 5 6

44. I would give up a lot not to feel bad …………………………………………………… 1 2 3 | 4 5 6

46. I can numb my feelings when they are too intense …………………………………….. 1 2 3 | 4 5 6

49. Some people have told me that I "hide my head in the sand" …………………………... 1 2 3 | 4 5 6

50. Pain always leads to suffering ………………………………………………………….. 1 2 3 | 4 5 6

52. It takes me awhile to realize when I'm feeling bad ……………………………………... 1 2 3 | 4 5 6

54. I wish I could get rid of all of my negative emotions …………………………………... 1 2 3 | 4 5 6

56. I feel disconnected from my emotions …………………………………………………. 1 2 3 | 4 5 6

58. The key to a good life is never feeling any pain ………………………………………... 1 2 3 | 4 5 6

60. People have told me that I'm not aware of my problems ………………………………… 1 2 3 | 4 5 6

61. I hope to live without any sadness and disappointment ………………………………... 1 2 3 | 4 5 6

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POST TREATMENT
Part I

We would like to know how your health has been in general over **the last few weeks.** Please circle the response that best applies to you.

1. **Been able to concentrate on what you're doing?**	better than usual	same as usual	less than usual	much less than usual
2. **Lost much sleep over worry?**	not at all	no more than usual	rather more than usual	much more than usual
3. **Felt that you are playing a useful part in things?**	more so than usual	same as usual	less so than usual	much less than usual
4. **Felt capable of making decisions about things?**	more so than usual	same as usual	less than usual	much less than usual
5. **Felt constantly under strain?**	not at all	no more than usual	rather more than usual	much more than usual
6. **Felt you couldn't overcome your difficulties?**	not at all	no more than usual	rather more than usual	much more than usual
7. **Been able to enjoy your normal day activities?**	more so than usual	same as usual	less so than usual	much less than usual
8. **Been able to face up to your problems?**	more so than usual	same as usual	less than usual	much less than usual
9. **Been feeling unhappy or depressed?**	not at all	no more than usual	rather more than usual	much more than usual
10. **Been losing confidence in yourself?**	not at all	no more than usual	rather more than usual	much more than usual
11. **Been thinking of yourself as a worthless person?**	not at all	no more than usual	rather more than usual	much more than usual
12. **Been feeling reasonably happy, all things considered?**	more so than usual	same as usual	less so than usual	much less than usual

Part II

How much have you been suffering with the following in the **<u>past 2 weeks</u>**: *(Please circle)*

1) Severe Headaches	Not at all	A little	Somewhat	Quite a lot	Extremely
2) Fluttering or movement in your stomach	Not at all	A little	Somewhat	Quite a lot	Extremely
3) Pain / tension in neck and shoulders	Not at all	A little	Somewhat	Quite a lot	Extremely
4) Burning / itching skin all over	Not at all	A little	Somewhat	Quite a lot	Extremely
5) Constriction of your head as if it was being gripped tightly from outside	Not at all	A little	Somewhat	Quite a lot	Extremely
6) Pain in the chest or heart	Not at all	A little	Somewhat	Quite a lot	Extremely
7) Mouth or throat feeling dry	Not at all	A little	Somewhat	Quite a lot	Extremely
8) Darkness or mist in front of your eyes	Not at all	A little	Somewhat	Quite a lot	Extremely
9) A burning sensation in your stomach	Not at all	A little	Somewhat	Quite a lot	Extremely
10) A lack of energy (weakness) much of the time	Not at all	A little	Somewhat	Quite a lot	Extremely
11) Head feeling hot or burning	Not at all	A little	Somewhat	Quite a lot	Extremely
12) Sweating a lot	Not at all	A little	Somewhat	Quite a lot	Extremely
13) Pressure or tightness on your chest or heart	Not at all	A little	Somewhat	Quite a lot	Extremely
14) Suffering ache or discomfort in the abdomen	Not at all	A little	Somewhat	Quite a lot	Extremely
15) A choking sensation in your throat	Not at all	A little	Somewhat	Quite a lot	Extremely
16) Hands or feet had pins and needles or gone numb	Not at all	A little	Somewhat	Quite a lot	Extremely
17) Felt aches or pains all over the body	Not at all	A little	Somewhat	Quite a lot	Extremely
18) A feeling of heat inside your body	Not at all	A little	Somewhat	Quite a lot	Extremely
19) Palpitations (heart pounding)	Not at all	A little	Somewhat	Quite a lot	Extremely
20) Pain or burning in your eyes	Not at all	A little	Somewhat	Quite a lot	Extremely
21) Indigestion	Not at all	A little	Somewhat	Quite a lot	Extremely
22) Trembling or shaking	Not at all	A little	Somewhat	Quite a lot	Extremely

23) Passing urine more frequently	Not at all	A little	Somewhat	Quite a lot	Extremely
24) Low back trouble	Not at all	A little	Somewhat	Quite a lot	Extremely
25) Stomach feeling swollen or bloated	Not at all	A little	Somewhat	Quite a lot	Extremely
26) Head feeling heavy	Not at all	A little	Somewhat	Quite a lot	Extremely
27) Feeling tired, even when you are not working	Not at all	A little	Somewhat	Quite a lot	Extremely
28) Pain in your legs	Not at all	A little	Somewhat	Quite a lot	Extremely
29) Feeling sick in the stomach (nausea)	Not at all	A little	Somewhat	Quite a lot	Extremely
30) Pressure inside your head as if your head was going to burst	Not at all	A little	Somewhat	Quite a lot	Extremely
31) Difficulty in breathing, even when resting	Not at all	A little	Somewhat	Quite a lot	Extremely
32) Tingling (pins and needles) all over the body	Not at all	A little	Somewhat	Quite a lot	Extremely
33) Constipation	Not at all	A little	Somewhat	Quite a lot	Extremely
34) Wanting to open your bowels (go to the toilet) more often than usual	Not at all	A little	Somewhat	Quite a lot	Extremely
35) Sweaty palms	Not at all	A little	Somewhat	Quite a lot	Extremely
36) Difficulty in swallowing, as if there was a lump in your throat	Not at all	A little	Somewhat	Quite a lot	Extremely
37) Feeling giddy or dizzy	Not at all	A little	Somewhat	Quite a lot	Extremely
38) A bitter taste in your mouth	Not at all	A little	Somewhat	Quite a lot	Extremely
39) Whole body feeing heavy	Not at all	A little	Somewhat	Quite a lot	Extremely
40) Burning sensation when passing urine	Not at all	A little	Somewhat	Quite a lot	Extremely
41) A buzzing noise in your ears or head	Not at all	A little	Somewhat	Quite a lot	Extremely
42) The feeling of a weak or sinking heart	Not at all	A little	Somewhat	Quite a lot	Extremely
43) Excessive wind (gas) or belching	Not at all	A little	Somewhat	Quite a lot	Extremely
44) Hands or feet feeling cold	Not at all	A little	Somewhat	Quite a lot	Extremely
MEN ONLY					
45) Difficulty getting full erection	Not at all	A little	Somewhat	Quite a lot	Extremely
46) Passing semen in your urine	Not at all	A little	Somewhat	Quite a lot	Extremely

Questionnaire Part III

Please rate each paragraph according to the *extent* to which you think each corresponds to your general relationship style.

A. It is easy for me to become emotionally close to others. I am comfortable depending on them and having them depend on me. I don't worry about being alone or having others not accept me.

Not at all like me			**Somewhat like me**			**Very much like me**
1	2	3	4	5	6	7

B. I am uncomfortable getting close to others. I want emotionally close relationships, but I find it difficult to trust others completely, or to depend on them. I worry that I will be hurt if I allow myself to become too close to others.

Not at all like me			**Somewhat like me**			**Very much like me**
1	2	3	4	5	6	7

C. I want to be completely emotionally intimate with others, but I often find that others are reluctant to get as close as I would like. I am uncomfortable being without close relationships, but I sometimes worry that others don't value me as much as I value them.

Not at all like me			**Somewhat like me**			**Very much like me**
1	2	3	4	5	6	7

D. I am comfortable without close emotional relationships, It is very important to me to feel independent and self-sufficient, and I prefer not to depend on others or have others depend on me.

Not at all like me			**Somewhat like me**			**Very much like me**
1	2	3	4	5	6	7

Questionnaire Part IV

These statements refer to how you *currently* feel about your practitioner.

Please try to respond to every item using the scale below to indicate how much you agree or disagree with each statement by circling a number.

	Strongly Disagree	Somewhat Disagree	Slightly Disagree	Slightly Agree	Somewhat Agree	Strongly Agree
1. I don't get enough emotional support from my practitioner.	1	2	3	4	5	6
2. My practitioner is sensitive to my needs.	1	2	3	4	5	6
3. I think my practitioner disapproves of me.	1	2	3	4	5	6
4. I yearn to be 'at one' with my practitioner.	1	2	3	4	5	6
5. 5. My practitioner is dependable.	1	2	3	4	5	6
6. Talking over my problems with my practitioner makes me feel ashamed or foolish.	1	2	3	4	5	6
7. I wish my practitioner could be with me on a daily basis.	1	2	3	4	5	6
8. I feel that somehow things will work out OK for me when I am with my practitioner.	1	2	3	4	5	6
9. I know I can tell my practitioner anything and he/she would not reject me.	1	2	3	4	5	6
10. I would like my practitioner to feel closer to me.	1	2	3	4	5	6
11. My practitioner isn't giving me enough attention.	1	2	3	4	5	6
12. I don't like to share my feelings with my practitioner.	1	2	3	4	5	6
13. I like to know more about my practitioner.	1	2	3	4	5	6
14. When I show my feelings, my practitioner responds in a helpful way.	1	2	3	4	5	6
15. I feel humiliated when I meet my practitioner.	1	2	3	4	5	6
16. I think about calling my practitioner at home.	1	2	3	4	5	6
17. I don't know how I expect my practitioner to react from day to day.	1	2	3	4	5	6
18. Sometimes I am afraid that if I don't please my practitioner, he/she will reject me.	1	2	3	4	5	6

	Strongly Disagree	Somewhat Disagree	Slightly Disagree	Slightly Agree	Somewhat Agree	Strongly Agree
19. I think about being my practitioner's favourite patient.	1	2	3	4	5	6
20. I can tell my practitioner enjoys working with me	1	2	3	4	5	6
21. I suspect my practitioner probably isn't honest with me.	1	2	3	4	5	6
22. I wish there were a way I could spend more time with my practitioner.	1	2	3	4	5	6
23. I resent having to work out problems on my own when my practitioner could be more helpful.	1	2	3	4	5	6
24. My practitioner wants to know more about me than I am comfortable talking about.	1	2	3	4	5	6
25. I wish I could do something for my practitioner too.	1	2	3	4	5	6
26. My practitioner helps me to look closely at the frightening or troubling things that have happened to me.	1	2	3	4	5	6
27. I feel safe with my practitioner.	1	2	3	4	5	6
28. I wish my practitioner were not my practitioner, so that we could be friends.	1	2	3	4	5	6
29. My practitioner is a comforting presence to me when I am upset.	1	2	3	4	5	6
30. My practitioner treats me more like a child, than an adult.	1	2	3	4	5	6
31. I often wonder about my practitioner's other clients.	1	2	3	4	5	6
32. I know my practitioner will understand the things that bother me.	1	2	3	4	5	6
33. It's hard for me to trust my practitioner.	1	2	3	4	5	6
34. I feel sure my practitioner will be there if I really need him/her.	1	2	3	4	5	6
35. I am not certain that my practitioner is all that concerned about me.	1	2	3	4	5	6
36. When I am with my practitioner I feel that I am his/her highest priority.	1	2	3	4	5	6

Please indicate the extent to which you agree or disagree with each of the following statements

1--------------------2--------------------3------------|----------4--------------------5--------------------6
strongly　　　　**moderately**　　　　**slightly**　　　　　**slightly**　　　　**moderately**　　　　**strongly**
disagree　　　　**disagree**　　　　**disagree**　　　　　**agree**　　　　　**agree**　　　　　**agree**

2.	If I could magically remove all of my painful memories, I would ………………………..	1 2 3 4 5 6
3.	When something upsetting comes up, I try very hard to stop thinking about it …………...	1 2 3 4 5 6
4.	I sometimes have difficulty identifying how I feel ……………………………………….…	1 2 3 4 5 6
7.	Happiness means never feeling any pain or disappointment ………………………………	1 2 3 4 5 6
9.	When negative thoughts come up, I try to fill my head with something else ……………...	1 2 3 4 5 6
10.	At times, people have told me I'm in denial ………………………………………………….	1 2 3 4 5 6
13.	When I am hurting, I would do anything to feel better ...……..……………………………..	1 2 3 4 5 6
15.	I usually try to distract myself when I feel something painful …………………………….	1 2 3 4 5 6
16.	I am able to "turn off" my emotions when I don't want to feel ……………………………	1 2 3 4 5 6
19.	Happiness involves getting rid of negative thoughts ………………………………………	1 2 3 4 5 6
21.	I don't realize I'm anxious until other people tell me ……………………………………...	1 2 3 4 5 6
22.	When upsetting memories come up, I try to focus on other things ………………………..	1 2 3 4 5 6
23.	I am in touch with my emotions …………………………………………………………….	1 2 3 4 5 6
25.	One of my big goals is to be free from painful emotions ………………………………….	1 2 3 4 5 6
27.	I work hard to keep out upsetting feelings ………………………………………………...	1 2 3 4 5 6
28.	People have said that I don't own up to my problems ……………………………………..	1 2 3 4 5 6
31.	I'd do anything to feel less stressed ………………………………………………………..	1 2 3 4 5 6
33.	When unpleasant memories come to me, I try to put them out of my mind ………………	1 2 3 4 5 6
34.	In this day and age people should not have to suffer ……………………………………....	1 2 3 4 5 6
35.	Others have told me that I suppress my feelings …………………………………………...	1 2 3 4 5 6
38.	My life would be great if I never felt anxious ……………………………………………...	1 2 3 4 5 6
40.	When a negative thought comes up, I immediately try to think of something else ……….	1 2 3 4 5 6
41.	It's hard for me to know what I'm feeling …………………………………………………...	1 2 3 4 5 6
44.	I would give up a lot not to feel bad ………………………………………………………..	1 2 3 4 5 6
46.	I can numb my feelings when they are too intense ………………………………………....	1 2 3 4 5 6
49.	Some people have told me that I "hide my head in the sand" ………………………………	1 2 3 4 5 6
50.	Pain always leads to suffering ……………………………………………………………..	1 2 3 4 5 6
52.	It takes me awhile to realize when I'm feeling bad ………………………………………..	1 2 3 4 5 6
54.	I wish I could get rid of all of my negative emotions ……………………………………..	1 2 3 4 5 6
56.	I feel disconnected from my emotions ……………………………………………………...	1 2 3 4 5 6
58.	The key to a good life is never feeling any pain …………………………………………...	1 2 3 4 5 6
60.	People have told me that I'm not aware of my problems …………………………………..	1 2 3 4 5 6
61.	I hope to live without any sadness and disappointment …………………………………...	1 2 3 4 5 6

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FOLLOW UP
Part I

We would like to know how your health has been in general over **the last few weeks.** Please circle the response that best applies to you.

1. **Been able to concentrate on what you're doing?**	better than usual	same as usual	less than usual	much less than usual
2. **Lost much sleep over worry?**	not at all	no more than usual	rather more than usual	much more than usual
3. **Felt that you are playing a useful part in things?**	more so than usual	same as usual	less so than usual	much less than usual
4. **Felt capable of making decisions about things?**	more so than usual	same as usual	less than usual	much less than usual
5. **Felt constantly under strain?**	not at all	no more than usual	rather more than usual	much more than usual
6. **Felt you couldn't overcome your difficulties?**	not at all	no more than usual	rather more than usual	much more than usual
7. **Been able to enjoy your normal day activities?**	more so than usual	same as usual	less so than usual	much less than usual
8. **Been able to face up to your problems?**	more so than usual	same as usual	less than usual	much less than usual
9. **Been feeling unhappy or depressed?**	not at all	no more than usual	rather more than usual	much more than usual
10. **Been losing confidence in yourself?**	not at all	no more than usual	rather more than usual	much more than usual
11. **Been thinking of yourself as a worthless person?**	not at all	no more than usual	rather more than usual	much more than usual
12. **Been feeling reasonably happy, all things considered?**	more so than usual	same as usual	less so than usual	much less than usual

Part II

How much have you been suffering with the following in the **past 2 weeks**: *(Please circle)*

1) Severe Headaches	Not at all	A little	Somewhat	Quite a lot	Extremely
2) Fluttering or movement in your stomach	Not at all	A little	Somewhat	Quite a lot	Extremely
3) Pain / tension in neck and shoulders	Not at all	A little	Somewhat	Quite a lot	Extremely
4) Burning / itching skin all over	Not at all	A little	Somewhat	Quite a lot	Extremely
5) Constriction of your head as if it was being gripped tightly from outside	Not at all	A little	Somewhat	Quite a lot	Extremely
6) Pain in the chest or heart	Not at all	A little	Somewhat	Quite a lot	Extremely
7) Mouth or throat feeling dry	Not at all	A little	Somewhat	Quite a lot	Extremely
8) Darkness or mist in front of your eyes	Not at all	A little	Somewhat	Quite a lot	Extremely
9) A burning sensation in your stomach	Not at all	A little	Somewhat	Quite a lot	Extremely
10) A lack of energy (weakness) much of the time	Not at all	A little	Somewhat	Quite a lot	Extremely
11) Head feeling hot or burning	Not at all	A little	Somewhat	Quite a lot	Extremely
12) Sweating a lot	Not at all	A little	Somewhat	Quite a lot	Extremely
13) Pressure or tightness on your chest or heart	Not at all	A little	Somewhat	Quite a lot	Extremely
14) Suffering ache or discomfort in the abdomen	Not at all	A little	Somewhat	Quite a lot	Extremely
15) A choking sensation in your throat	Not at all	A little	Somewhat	Quite a lot	Extremely
16) Hands or feet had pins and needles or gone numb	Not at all	A little	Somewhat	Quite a lot	Extremely
17) Felt aches or pains all over the body	Not at all	A little	Somewhat	Quite a lot	Extremely
18) A feeling of heat inside your body	Not at all	A little	Somewhat	Quite a lot	Extremely
19) Palpitations (heart pounding)	Not at all	A little	Somewhat	Quite a lot	Extremely
20) Pain or burning in your eyes	Not at all	A little	Somewhat	Quite a lot	Extremely
21) Indigestion	Not at all	A little	Somewhat	Quite a lot	Extremely
22) Trembling or shaking	Not at all	A little	Somewhat	Quite a lot	Extremely
23) Passing urine more frequently	Not at all	A little	Somewhat	Quite a lot	Extremely

24) Low back trouble	Not at all	A little	Somewhat	Quite a lot	Extremely
25) Stomach feeling swollen or bloated	Not at all	A little	Somewhat	Quite a lot	Extremely
26) Head feeling heavy	Not at all	A little	Somewhat	Quite a lot	Extremely
27) Feeling tired, even when you are not working	Not at all	A little	Somewhat	Quite a lot	Extremely
28) Pain in your legs	Not at all	A little	Somewhat	Quite a lot	Extremely
29) Feeling sick in the stomach (nausea)	Not at all	A little	Somewhat	Quite a lot	Extremely
30) Pressure inside your head as if your head was going to burst	Not at all	A little	Somewhat	Quite a lot	Extremely
31) Difficulty in breathing, even when resting	Not at all	A little	Somewhat	Quite a lot	Extremely
32) Tingling (pins and needles) all over the body	Not at all	A little	Somewhat	Quite a lot	Extremely
33) Constipation	Not at all	A little	Somewhat	Quite a lot	Extremely
34) Wanting to open your bowels (go to the toilet) more often than usual	Not at all	A little	Somewhat	Quite a lot	Extremely
35) Sweaty palms	Not at all	A little	Somewhat	Quite a lot	Extremely
36) Difficulty in swallowing, as if there was a lump in your throat	Not at all	A little	Somewhat	Quite a lot	Extremely
37) Feeling giddy or dizzy	Not at all	A little	Somewhat	Quite a lot	Extremely
38) A bitter taste in your mouth	Not at all	A little	Somewhat	Quite a lot	Extremely
39) Whole body feeing heavy	Not at all	A little	Somewhat	Quite a lot	Extremely
40) Burning sensation when passing urine	Not at all	A little	Somewhat	Quite a lot	Extremely
41) A buzzing noise in your ears or head	Not at all	A little	Somewhat	Quite a lot	Extremely
42) The feeling of a weak or sinking heart	Not at all	A little	Somewhat	Quite a lot	Extremely
43) Excessive wind (gas) or belching	Not at all	A little	Somewhat	Quite a lot	Extremely
44) Hands or feet feeling cold	Not at all	A little	Somewhat	Quite a lot	Extremely
MEN ONLY					
45) Difficulty getting full erection	Not at all	A little	Somewhat	Quite a lot	Extremely
46) Passing semen in your urine	Not at all	A little	Somewhat	Quite a lot	Extremely

Questionnaire Part III

Please rate each paragraph according to the *extent* to which you think each corresponds to your general relationship style.

A. It is easy for me to become emotionally close to others. I am comfortable depending on them and having them depend on me. I don't worry about being alone or having others not accept me.

Not at all like me			**Somewhat like me**			**Very much like me**
1	2	3	4	5	6	7

B. I am uncomfortable getting close to others. I want emotionally close relationships, but I find it difficult to trust others completely, or to depend on them. I worry that I will be hurt if I allow myself to become too close to others.

Not at all like me			**Somewhat like me**			**Very much like me**
1	2	3	4	5	6	7

C. I want to be completely emotionally intimate with others, but I often find that others are reluctant to get as close as I would like. I am uncomfortable being without close relationships, but I sometimes worry that others don't value me as much as I value them.

Not at all like me			**Somewhat like me**			**Very much like me**
1	2	3	4	5	6	7

D. I am comfortable without close emotional relationships, It is very important to me to feel independent and self-sufficient, and I prefer not to depend on others or have others depend on me.

Not at all like me			**Somewhat like me**			**Very much like me**
1	2	3	4	5	6	7

Questionnaire Part IV

These statements refer to how you *currently* feel about your practitioner.

Please try to respond to every item using the scale below to indicate how much you agree or disagree with each statement by circling a number.

	Strongly Disagree	Somewhat Disagree	Slightly Disagree	Slightly Agree	Somewhat Agree	Strongly Agree
1. I don't get enough emotional support from my practitioner.	1	2	3	4	5	6
2. My practitioner is sensitive to my needs.	1	2	3	4	5	6
3. I think my practitioner disapproves of me.	1	2	3	4	5	6
4. I yearn to be 'at one' with my practitioner.	1	2	3	4	5	6
5. 5. My practitioner is dependable.	1	2	3	4	5	6
6. Talking over my problems with my practitioner makes me feel ashamed or foolish.	1	2	3	4	5	6
7. I wish my practitioner could be with me on a daily basis.	1	2	3	4	5	6
8. I feel that somehow things will work out OK for me when I am with my practitioner.	1	2	3	4	5	6
9. I know I can tell my practitioner anything and he/she would not reject me.	1	2	3	4	5	6
10. I would like my practitioner to feel closer to me.	1	2	3	4	5	6
11. My practitioner isn't giving me enough attention.	1	2	3	4	5	6
12. I don't like to share my feelings with my practitioner.	1	2	3	4	5	6
13. I like to know more about my practitioner.	1	2	3	4	5	6
14. When I show my feelings, my practitioner responds in a helpful way.	1	2	3	4	5	6
15. I feel humiliated when I meet my practitioner.	1	2	3	4	5	6
16. I think about calling my practitioner at home.	1	2	3	4	5	6
17. I don't know how I expect my practitioner to react from day to day.	1	2	3	4	5	6
18. Sometimes I am afraid that if I don't please my practitioner, he/she will reject me.	1	2	3	4	5	6

	Strongly Disagree	Somewhat Disagree	Slightly Disagree	Slightly Agree	Somewhat Agree	Strongly Agree
19. I think about being my practitioner's favourite patient.	1	2	3	4	5	6
20. I can tell my practitioner enjoys working with me	1	2	3	4	5	6
21. I suspect my practitioner probably isn't honest with me.	1	2	3	4	5	6
22. I wish there were a way I could spend more time with my practitioner.	1	2	3	4	5	6
23. I resent having to work out problems on my own when my practitioner could be more helpful.	1	2	3	4	5	6
24. My practitioner wants to know more about me than I am comfortable talking about.	1	2	3	4	5	6
25. I wish I could do something for my practitioner too.	1	2	3	4	5	6
26. My practitioner helps me to look closely at the frightening or troubling things that have happened to me.	1	2	3	4	5	6
27. I feel safe with my practitioner.	1	2	3	4	5	6
28. I wish my practitioner were not my practitioner, so that we could be friends.	1	2	3	4	5	6
29. My practitioner is a comforting presence to me when I am upset.	1	2	3	4	5	6
30. My practitioner treats me more like a child, than an adult.	1	2	3	4	5	6
31. I often wonder about my practitioner's other clients.	1	2	3	4	5	6
32. I know my practitioner will understand the things that bother me.	1	2	3	4	5	6
33. It's hard for me to trust my practitioner.	1	2	3	4	5	6
34. I feel sure my practitioner will be there if I really need him/her.	1	2	3	4	5	6
35. I am not certain that my practitioner is all that concerned about me.	1	2	3	4	5	6
36. When I am with my practitioner I feel that I am his/her highest priority.	1	2	3	4	5	6

Please indicate the extent to which you agree or disagree with each of the following statements

1	2	3	4	5	6
strongly disagree	moderately disagree	slightly disagree	slightly agree	moderately agree	strongly agree

2. If I could magically remove all of my painful memories, I would …………………………... 1 2 3 | 4 5 6

3. When something upsetting comes up, I try very hard to stop thinking about it …………... 1 2 3 | 4 5 6

4. I sometimes have difficulty identifying how I feel …………………………………………... 1 2 3 | 4 5 6

7. Happiness means never feeling any pain or disappointment …………………………….… 1 2 3 | 4 5 6

9. When negative thoughts come up, I try to fill my head with something else …………….... 1 2 3 | 4 5 6

10. At times, people have told me I'm in denial …………………………………………………. 1 2 3 | 4 5 6

13. When I am hurting, I would do anything to feel better ...……………………………………. 1 2 3 | 4 5 6

15. I usually try to distract myself when I feel something painful …………………………….… 1 2 3 | 4 5 6

16. I am able to "turn off" my emotions when I don't want to feel ……………………………. 1 2 3 | 4 5 6

19. Happiness involves getting rid of negative thoughts ………………………………………. 1 2 3 | 4 5 6

21. I don't realize I'm anxious until other people tell me ……………………………………….. 1 2 3 | 4 5 6

22. When upsetting memories come up, I try to focus on other things ………………………... 1 2 3 | 4 5 6

23. I am in touch with my emotions ……………………………………………………………... 1 2 3 | 4 5 6

25. One of my big goals is to be free from painful emotions …………………………………… 1 2 3 | 4 5 6

27. I work hard to keep out upsetting feelings ………………………………………………….. 1 2 3 | 4 5 6

28. People have said that I don't own up to my problems ………………………………………. 1 2 3 | 4 5 6

31. I'd do anything to feel less stressed ………………………………………………………….. 1 2 3 | 4 5 6

33. When unpleasant memories come to me, I try to put them out of my mind ………………. 1 2 3 | 4 5 6

34. In this day and age people should not have to suffer ……………………………………... 1 2 3 | 4 5 6

35. Others have told me that I suppress my feelings ……………………………………………. 1 2 3 | 4 5 6

38. My life would be great if I never felt anxious ………………………………………………... 1 2 3 | 4 5 6

40. When a negative thought comes up, I immediately try to think of something else ………. 1 2 3 | 4 5 6

41. It's hard for me to know what I'm feeling ………………………………………………….... 1 2 3 | 4 5 6

44. I would give up a lot not to feel bad …………………………………………………………… 1 2 3 | 4 5 6

46. I can numb my feelings when they are too intense …………………………………………... 1 2 3 | 4 5 6

49. Some people have told me that I "hide my head in the sand" ……………………………... 1 2 3 | 4 5 6

50. Pain always leads to suffering ………………………………………………………………... 1 2 3 | 4 5 6

52. It takes me awhile to realize when I'm feeling bad …………………………………………. 1 2 3 | 4 5 6

54. I wish I could get rid of all of my negative emotions ……………………………………….. 1 2 3 | 4 5 6

56. I feel disconnected from my emotions ………………………………………………………. 1 2 3 | 4 5 6

58. The key to a good life is never feeling any pain …………………………………………….. 1 2 3 | 4 5 6

60. People have told me that I'm not aware of my problems …………………………………… 1 2 3 | 4 5 6

61. I hope to live without any sadness and disappointment …………………………………... 1 2 3 | 4 5 6

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APPENDIX B – STUDY TWO PARTICIPANT QUESTIONNAIRE PACK

Consent form for participation in Acupuncture Research

This study aims to help better understand how effective acupuncture is at treating individuals' health problems. The research is conducted in the Psychology Department, University of Bedfordshire with the approval of the Research Centre for Applied Psychology and University Ethics Committee and in collaboration with your clinic (Shaftesbury Clinic).

By signing this form you are consenting to take part in this piece of research. This will consist of completing three questionnaires; one today; one in around 5-6 weeks and a follow-up questionnaire a few months after the study which will be completed online.

To protect your data and your anonymity, please do not write your name anywhere on the question pages. Please fill in your name on the sheet where indicated, detach this sheet from the questionnaire itself, and give both coversheet and questionnaire to your practitioner. All information you provide will be treated with the strictest confidence and will be reduced to numbers for statistical analysis. Throughout the analysis, your data will be identified via a code (top right) so that anonymity of your data is preserved.

Should you wish to withdraw from the trial you may do so at any time, even if you have already completed some or all of the questionnaires. If you wish to withdraw, require further information, or are interested in the findings of the study, feel free to email Ashley Bennett on ashley.bennett@beds.ac.uk or Dr. Antigonos Sochos on antigonos.sochos@beds.ac.uk, tel: 01234 400 400 or speak with your practitioner.

If you feel like you would like to talk to someone in confidence about something raised during participation in this trial please ask for more information.

We thank you greatly for your participation in this trial.

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First Name *(Please print)*:_____

Surname *(Please print)*:_____

Email/Contact Telephone* *(please print)*: _____

I agree for data collected in the following questionnaires to be used as part of the study.

Signed:_____

* This information will be used to contact you in order to complete the follow up questionnaire. The follow-up questionnaire is an online questionnaire so an email address is preferred; however, we are able to arrange for a hard copy to be sent to you for completion and return if you would prefer this please write your address clearly below.

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Part I Background Information

What   is   the   Name   of   your Acupuncturist?:_____

Age:_____

Gender (Please Circle):   M   F

Ethnicity: White [ ]   Bangladeshi [ ]   Pakistani [ ]   Indian [ ]   Chinese [ ]

Black African [ ]   Black Caribbean [ ]   Other ....   Mixed Ethnicity ....

Please fill in the following questions to the best of your knowledge.

1. **What problem brings you to the clinic today?**_____

2. **What is todays date (DD/MM/YY)?**   ___ ___ **/** ___ ___ **/** ___ ___

3. **How many times have you visited a health professional (western medicine**

eg. GP, Nurse, Consultant) for this problem in the last six months   _____

4. **Was a western diagnosis given by a Consultant, GP or Nurse?**: Yes [ ]   No

[ ]

5. **If yes, what was the diagnosis given?**_____

6. **How successful has the western treatment been during that period (of six**

   months): [*Please circle]*

Very Successful   Successful   Neither Successful/Unsuccessful   Unsuccessful   Very Unsuccessful

7. How many times have you visited a health professional for any problem other than the current in the past six months _____

8. Have you <u>ever</u> been given any of the following diagnoses *(please tick all that apply)***:**

Irritable bowel syndrome [ ]   Pelvic pain [ ]   A psychiatric diagnosis [ ]

Fibromyalgia [ ]   Fibrositis [ ]   Low back pain [ ]

Chronic back pain [ ]   Tension headache [ ]   Chronic headaches [ ]   Atypical facial pain [ ]   Chronic fatigue (ME) [ ]

Palpitations [ ]

Post-viral fatigue syndrome [ ]   Non☐cardiac chest pain [ ]

Non-ulcer dyspepsia [ ]   Dizziness [ ]   Insomnia [ ]

Mitral Valve Prolapse [ ]   Multiple Chemical Sensitivity [ ]   Globus [ ]

Sick Building Syndrome [ ]   Repetitive Strain Injury [ ]

Chronic Whiplash [ ]   Hyperventilation Syndrome [ ]

Pre-menstrual Syndrome [ ]   Vocal Cord Dysfunction [ ]

Temporomandibular Joint Disorder [ ]

9. If yes, how long ago? _____

Part II

We would like to know how your health has been in general over **the last few weeks.** Please circle the response that best applies to you.

8. **Been able to concentrate on what you're doing?**	better than usual	same as usual	less than usual	much less than usual
9. **Lost much sleep over worry?**	not at all	no more than usual	rather more than usual	much more than usual
10. **Felt that you are playing a useful part in things?**	more so than usual	same as usual	less so than usual	much less than usual
11. **Felt capable of making decisions about things?**	more so than usual	same as usual	less than usual	much less than usual
12. **Felt constantly under strain?**	not at all	no more than usual	rather more than usual	much more than usual
13. **Felt you couldn't overcome your difficulties?**	not at all	no more than usual	rather more than usual	much more than usual
14. **Been able to enjoy your normal day activities?**	more so than usual	same as usual	less so than usual	much less than usual
8. **Been able to face up to your problems?**	more so than usual	same as usual	less than usual	much less than usual
9. **Been feeling unhappy or depressed?**	not at all	no more than usual	rather more than usual	much more than usual
10. **Been losing confidence in yourself?**	not at all	no more than usual	rather more than usual	much more than usual
11. **Been thinking of yourself as a worthless person?**	not at all	no more than usual	rather more than usual	much more than usual
12. **Been feeling reasonably happy, all things considered?**	more so than usual	same as usual	less so than usual	much less than usual

Part III

How much have you been suffering with the following in the **past 2 weeks**: *(Please circle)*

47)Severe Headaches	Not at all	A little	Somewhat	Quite a lot	Extremely
48)Fluttering or movement in your stomach	Not at all	A little	Somewhat	Quite a lot	Extremely
49)Pain / tension in neck and shoulders	Not at all	A little	Somewhat	Quite a lot	Extremely
50)Burning / itching skin all over	Not at all	A little	Somewhat	Quite a lot	Extremely
51)Constriction of your head as if it was being gripped tightly from outside	Not at all	A little	Somewhat	Quite a lot	Extremely
52)Pain in the chest or heart	Not at all	A little	Somewhat	Quite a lot	Extremely
53)Mouth or throat feeling dry	Not at all	A little	Somewhat	Quite a lot	Extremely
54)Darkness or mist in front of your eyes	Not at all	A little	Somewhat	Quite a lot	Extremely
55)A burning sensation in your stomach	Not at all	A little	Somewhat	Quite a lot	Extremely
56) A lack of energy (weakness) much of the time	Not at all	A little	Somewhat	Quite a lot	Extremely
57) Head feeling hot or burning	Not at all	A little	Somewhat	Quite a lot	Extremely
58) Sweating a lot	Not at all	A little	Somewhat	Quite a lot	Extremely
59) Pressure or tightness on your chest or heart	Not at all	A little	Somewhat	Quite a lot	Extremely
60) Suffering ache or discomfort in the abdomen	Not at all	A little	Somewhat	Quite a lot	Extremely
61) A choking sensation in your throat	Not at all	A little	Somewhat	Quite a lot	Extremely
62) Hands or feet had pins and needles or gone numb	Not at all	A little	Somewhat	Quite a lot	Extremely
63) Felt aches or pains all over the body	Not at all	A little	Somewhat	Quite a lot	Extremely
64) A feeling of heat inside your body	Not at all	A little	Somewhat	Quite a lot	Extremely
65) Palpitations (heart pounding)	Not at all	A little	Somewhat	Quite a lot	Extremely
66) Pain or burning in your eyes	Not at all	A little	Somewhat	Quite a lot	Extremely
67) Indigestion	Not at all	A little	Somewhat	Quite a lot	Extremely
68) Trembling or shaking	Not at all	A little	Somewhat	Quite a lot	Extremely
69) Passing urine more frequently	Not at all	A little	Somewhat	Quite a lot	Extremely

70) Low back trouble	Not at all	A little	Somewhat	Quite a lot	Extremely
71) Stomach feeling swollen or bloated	Not at all	A little	Somewhat	Quite a lot	Extremely
72) Head feeling heavy	Not at all	A little	Somewhat	Quite a lot	Extremely
73) Feeling tired, even when you are not working	Not at all	A little	Somewhat	Quite a lot	Extremely
74) Pain in your legs	Not at all	A little	Somewhat	Quite a lot	Extremely
75) Feeling sick in the stomach (nausea)	Not at all	A little	Somewhat	Quite a lot	Extremely
76) Pressure inside your head as if your head was going to burst	Not at all	A little	Somewhat	Quite a lot	Extremely
77) Difficulty in breathing, even when resting	Not at all	A little	Somewhat	Quite a lot	Extremely
78) Tingling (pins and needles) all over the body	Not at all	A little	Somewhat	Quite a lot	Extremely
79) Constipation	Not at all	A little	Somewhat	Quite a lot	Extremely
80) Wanting to open your bowels (go to the toilet) more often than usual	Not at all	A little	Somewhat	Quite a lot	Extremely
81) Sweaty palms	Not at all	A little	Somewhat	Quite a lot	Extremely
82) Difficulty in swallowing, as if there was a lump in your throat	Not at all	A little	Somewhat	Quite a lot	Extremely
83) Feeling giddy or dizzy	Not at all	A little	Somewhat	Quite a lot	Extremely
84) A bitter taste in your mouth	Not at all	A little	Somewhat	Quite a lot	Extremely
85) Whole body feeing heavy	Not at all	A little	Somewhat	Quite a lot	Extremely
86) Burning sensation when passing urine	Not at all	A little	Somewhat	Quite a lot	Extremely
87) A buzzing noise in your ears or head	Not at all	A little	Somewhat	Quite a lot	Extremely
88) The feeling of a weak or sinking heart	Not at all	A little	Somewhat	Quite a lot	Extremely
89) Excessive wind (gas) or belching	Not at all	A little	Somewhat	Quite a lot	Extremely
90) Hands or feet feeling cold	Not at all	A little	Somewhat	Quite a lot	Extremely
MEN ONLY					
91) Difficulty getting full erection	Not at all	A little	Somewhat	Quite a lot	Extremely
92) Passing semen in your urine	Not at all	A little	Somewhat	Quite a lot	Extremely

Questionnaire Part IV

Please rate each paragraph according to the *extent* to which you think each corresponds to your general relationship style.

A. It is easy for me to become emotionally close to others. I am comfortable depending on them and having them depend on me. I don't worry about being alone or having others not accept me.

Not at all like me			Somewhat like me			Very much like me
1	2	3	4	5	6	7

B. I am uncomfortable getting close to others. I want emotionally close relationships, but I find it difficult to trust others completely, or to depend on them. I worry that I will be hurt if I allow myself to become too close to others.

Not at all like me			Somewhat like me			Very much like me
1	2	3	4	5	6	7

C. I want to be completely emotionally intimate with others, but I often find that others are reluctant to get as close as I would like. I am uncomfortable being without close relationships, but I sometimes worry that others don't value me as much as I value them.

Not at all like me			Somewhat like me			Very much like me
1	2	3	4	5	6	7

D. I am comfortable without close emotional relationships, It is very important to me to feel independent and self-sufficient, and I prefer not to depend on others or have others depend on me.

Not at all like me			Somewhat like me			Very much like me
1	2	3	4	5	6	7

Please indicate the extent to which you agree or disagree with each of the following statements

1	2	3	4	5	6
strongly disagree	moderately disagree	slightly disagree	slightly agree	moderately agree	strongly agree

2. If I could magically remove all of my painful memories, I would …………………………... 1 2 3 | 4 5 6

3. When something upsetting comes up, I try very hard to stop thinking about it …………... 1 2 3 | 4 5 6

4. I sometimes have difficulty identifying how I feel …………………………………………... 1 2 3 | 4 5 6

7. Happiness means never feeling any pain or disappointment ……………………………… 1 2 3 | 4 5 6

9. When negative thoughts come up, I try to fill my head with something else ……………... 1 2 3 | 4 5 6

10. At times, people have told me I'm in denial …………………………………………………. 1 2 3 | 4 5 6

13. When I am hurting, I would do anything to feel better ...…………………………………….. 1 2 3 | 4 5 6

15. I usually try to distract myself when I feel something painful ……………………………… 1 2 3 | 4 5 6

16. I am able to "turn off" my emotions when I don't want to feel …………………………….. 1 2 3 | 4 5 6

19. Happiness involves getting rid of negative thoughts ………………………………………. 1 2 3 | 4 5 6

21. I don't realize I'm anxious until other people tell me …………………………………….. 1 2 3 | 4 5 6

22. When upsetting memories come up, I try to focus on other things ………………………. 1 2 3 | 4 5 6

23. I am in touch with my emotions ……………………………………………………………... 1 2 3 | 4 5 6

25. One of my big goals is to be free from painful emotions …………………………………… 1 2 3 | 4 5 6

27. I work hard to keep out upsetting feelings ………………………………………………….. 1 2 3 | 4 5 6

28. People have said that I don't own up to my problems ………………………………………. 1 2 3 | 4 5 6

31. I'd do anything to feel less stressed ………………………………………………………… 1 2 3 | 4 5 6

33. When unpleasant memories come to me, I try to put them out of my mind ……………… 1 2 3 | 4 5 6

34. In this day and age people should not have to suffer ……………………………………... 1 2 3 | 4 5 6

35. Others have told me that I suppress my feelings …………………………………………… 1 2 3 | 4 5 6

38. My life would be great if I never felt anxious ………………………………………………… 1 2 3 | 4 5 6

40. When a negative thought comes up, I immediately try to think of something else ………. 1 2 3 | 4 5 6

41. It's hard for me to know what I'm feeling ……………………………………………………. 1 2 3 | 4 5 6

44. I would give up a lot not to feel bad ………………………………………………………… 1 2 3 | 4 5 6

46. I can numb my feelings when they are too intense ………………………………………... 1 2 3 | 4 5 6

49. Some people have told me that I "hide my head in the sand" ……………………………… 1 2 3 | 4 5 6

50. Pain always leads to suffering ……………………………………………………………….. 1 2 3 | 4 5 6

52. It takes me awhile to realize when I'm feeling bad ………………………………………… 1 2 3 | 4 5 6

54. I wish I could get rid of all of my negative emotions ……………………………………….. 1 2 3 | 4 5 6

56. I feel disconnected from my emotions ………………………………………………………. 1 2 3 | 4 5 6

58. The key to a good life is never feeling any pain …………………………………………….. 1 2 3 | 4 5 6

60. People have told me that I'm not aware of my problems …………………………………… 1 2 3 | 4 5 6

61. I hope to live without any sadness and disappointment …………………………………... 1 2 3 | 4 5 6

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POST TREATMENT
Part I

We would like to know how your health has been in general over **the last few weeks.** Please circle the response that best applies to you.

8. **Been able to concentrate on what you're doing?**	better than usual	same as usual	less than usual	much less than usual
9. **Lost much sleep over worry?**	not at all	no more than usual	rather more than usual	much more than usual
10. **Felt that you are playing a useful part in things?**	more so than usual	same as usual	less so than usual	much less than usual
11. **Felt capable of making decisions about things?**	more so than usual	same as usual	less than usual	much less than usual
12. **Felt constantly under strain?**	not at all	no more than usual	rather more than usual	much more than usual
13. **Felt you couldn't overcome your difficulties?**	not at all	no more than usual	rather more than usual	much more than usual
14. **Been able to enjoy your normal day activities?**	more so than usual	same as usual	less so than usual	much less than usual
8. **Been able to face up to your problems?**	more so than usual	same as usual	less than usual	much less than usual
9. **Been feeling unhappy or depressed?**	not at all	no more than usual	rather more than usual	much more than usual
10. **Been losing confidence in yourself?**	not at all	no more than usual	rather more than usual	much more than usual
11. **Been thinking of yourself as a worthless person?**	not at all	no more than usual	rather more than usual	much more than usual
12. **Been feeling reasonably happy, all things considered?**	more so than usual	same as usual	less so than usual	much less than usual

Part II

How much have you been suffering with the following in the **past 2 weeks**: *(Please circle)*

47)Severe Headaches	Not at all	A little	Somewhat	Quite a lot	Extremely
48)Fluttering or movement in your stomach	Not at all	A little	Somewhat	Quite a lot	Extremely
49)Pain / tension in neck and shoulders	Not at all	A little	Somewhat	Quite a lot	Extremely
50)Burning / itching skin all over	Not at all	A little	Somewhat	Quite a lot	Extremely
51)Constriction of your head as if it was being gripped tightly from outside	Not at all	A little	Somewhat	Quite a lot	Extremely
52)Pain in the chest or heart	Not at all	A little	Somewhat	Quite a lot	Extremely
53)Mouth or throat feeling dry	Not at all	A little	Somewhat	Quite a lot	Extremely
54)Darkness or mist in front of your eyes	Not at all	A little	Somewhat	Quite a lot	Extremely
55)A burning sensation in your stomach	Not at all	A little	Somewhat	Quite a lot	Extremely
56) A lack of energy (weakness) much of the time	Not at all	A little	Somewhat	Quite a lot	Extremely
57) Head feeling hot or burning	Not at all	A little	Somewhat	Quite a lot	Extremely
58) Sweating a lot	Not at all	A little	Somewhat	Quite a lot	Extremely
59) Pressure or tightness on your chest or heart	Not at all	A little	Somewhat	Quite a lot	Extremely
60) Suffering ache or discomfort in the abdomen	Not at all	A little	Somewhat	Quite a lot	Extremely
61) A choking sensation in your throat	Not at all	A little	Somewhat	Quite a lot	Extremely
62) Hands or feet had pins and needles or gone numb	Not at all	A little	Somewhat	Quite a lot	Extremely
63) Felt aches or pains all over the body	Not at all	A little	Somewhat	Quite a lot	Extremely
64) A feeling of heat inside your body	Not at all	A little	Somewhat	Quite a lot	Extremely
65) Palpitations (heart pounding)	Not at all	A little	Somewhat	Quite a lot	Extremely
66) Pain or burning in your eyes	Not at all	A little	Somewhat	Quite a lot	Extremely
67) Indigestion	Not at all	A little	Somewhat	Quite a lot	Extremely
68) Trembling or shaking	Not at all	A little	Somewhat	Quite a lot	Extremely

69) Passing urine more frequently	Not at all	A little	Somewhat	Quite a lot	Extremely
70) Low back trouble	Not at all	A little	Somewhat	Quite a lot	Extremely
71) Stomach feeling swollen or bloated	Not at all	A little	Somewhat	Quite a lot	Extremely
72) Head feeling heavy	Not at all	A little	Somewhat	Quite a lot	Extremely
73) Feeling tired, even when you are not working	Not at all	A little	Somewhat	Quite a lot	Extremely
74) Pain in your legs	Not at all	A little	Somewhat	Quite a lot	Extremely
75) Feeling sick in the stomach (nausea)	Not at all	A little	Somewhat	Quite a lot	Extremely
76) Pressure inside your head as if your head was going to burst	Not at all	A little	Somewhat	Quite a lot	Extremely
77) Difficulty in breathing, even when resting	Not at all	A little	Somewhat	Quite a lot	Extremely
78) Tingling (pins and needles) all over the body	Not at all	A little	Somewhat	Quite a lot	Extremely
79) Constipation	Not at all	A little	Somewhat	Quite a lot	Extremely
80) Wanting to open your bowels (go to the toilet) more often than usual	Not at all	A little	Somewhat	Quite a lot	Extremely
81) Sweaty palms	Not at all	A little	Somewhat	Quite a lot	Extremely
82) Difficulty in swallowing, as if there was a lump in your throat	Not at all	A little	Somewhat	Quite a lot	Extremely
83) Feeling giddy or dizzy	Not at all	A little	Somewhat	Quite a lot	Extremely
84) A bitter taste in your mouth	Not at all	A little	Somewhat	Quite a lot	Extremely
85) Whole body feeing heavy	Not at all	A little	Somewhat	Quite a lot	Extremely
86) Burning sensation when passing urine	Not at all	A little	Somewhat	Quite a lot	Extremely
87) A buzzing noise in your ears or head	Not at all	A little	Somewhat	Quite a lot	Extremely
88) The feeling of a weak or sinking heart	Not at all	A little	Somewhat	Quite a lot	Extremely
89) Excessive wind (gas) or belching	Not at all	A little	Somewhat	Quite a lot	Extremely
90) Hands or feet feeling cold	Not at all	A little	Somewhat	Quite a lot	Extremely
MEN ONLY					
91) Difficulty getting full erection	Not at all	A little	Somewhat	Quite a lot	Extremely
92) Passing semen in your urine	Not at all	A little	Somewhat	Quite a lot	Extremely

Questionnaire Part III

Please rate each paragraph according to the *extent* to which you think each corresponds to your general relationship style.

A. It is easy for me to become emotionally close to others. I am comfortable depending on them and having them depend on me. I don't worry about being alone or having others not accept me.

Not at all like me			**Somewhat like me**			**Very much like me**
1	2	3	4	5	6	7

B. I am uncomfortable getting close to others. I want emotionally close relationships, but I find it difficult to trust others completely, or to depend on them. I worry that I will be hurt if I allow myself to become too close to others.

Not at all like me			**Somewhat like me**			**Very much like me**
1	2	3	4	5	6	7

C. I want to be completely emotionally intimate with others, but I often find that others are reluctant to get as close as I would like. I am uncomfortable being without close relationships, but I sometimes worry that others don't value me as much as I value them.

Not at all like me			**Somewhat like me**			**Very much like me**
1	2	3	4	5	6	7

D. I am comfortable without close emotional relationships, It is very important to me to feel independent and self-sufficient, and I prefer not to depend on others or have others depend on me.

Not at all like me			**Somewhat like me**			**Very much like me**
1	2	3	4	5	6	7

Questionnaire Part IV

These statements refer to how you *currently* feel about your practitioner.

Please try to respond to every item using the scale below to indicate how much you agree or disagree with each statement by circling a number.

	Strongly Disagree	Somewhat Disagree	Slightly Disagree	Slightly Agree	Somewhat Agree	Strongly Agree
37. I don't get enough emotional support from my practitioner.	1	2	3	4	5	6
38. My practitioner is sensitive to my needs.	1	2	3	4	5	6
39. I think my practitioner disapproves of me.	1	2	3	4	5	6
40. I yearn to be 'at one' with my practitioner.	1	2	3	4	5	6
41. 5. My practitioner is dependable.	1	2	3	4	5	6
42. Talking over my problems with my practitioner makes me feel ashamed or foolish.	1	2	3	4	5	6
43. I wish my practitioner could be with me on a daily basis.	1	2	3	4	5	6
44. I feel that somehow things will work out OK for me when I am with my practitioner.	1	2	3	4	5	6
45. I know I can tell my practitioner anything and he/she would not reject me.	1	2	3	4	5	6
46. I would like my practitioner to feel closer to me.	1	2	3	4	5	6
47. My practitioner isn't giving me enough attention.	1	2	3	4	5	6
48. I don't like to share my feelings with my practitioner.	1	2	3	4	5	6
49. I like to know more about my practitioner.	1	2	3	4	5	6
50. When I show my feelings, my practitioner responds in a helpful way.	1	2	3	4	5	6
51. I feel humiliated when I meet my practitioner.	1	2	3	4	5	6
52. I think about calling my practitioner at home.	1	2	3	4	5	6
53. I don't know how I expect my practitioner to react from day to day.	1	2	3	4	5	6
54. Sometimes I am afraid that if I don't please my practitioner, he/she will reject me.	1	2	3	4	5	6

	Strongly Disagree	Somewhat Disagree	Slightly Disagree	Slightly Agree	Somewhat Agree	Strongly Agree
55. I think about being my practitioner's favourite patient.	1	2	3	4	5	6
56. I can tell my practitioner enjoys working with me	1	2	3	4	5	6
57. I suspect my practitioner probably isn't honest with me.	1	2	3	4	5	6
58. I wish there were a way I could spend more time with my practitioner.	1	2	3	4	5	6
59. I resent having to work out problems on my own when my practitioner could be more helpful.	1	2	3	4	5	6
60. My practitioner wants to know more about me than I am comfortable talking about.	1	2	3	4	5	6
61. I wish I could do something for my practitioner too.	1	2	3	4	5	6
62. My practitioner helps me to look closely at the frightening or troubling things that have happened to me.	1	2	3	4	5	6
63. I feel safe with my practitioner.	1	2	3	4	5	6
64. I wish my practitioner were not my practitioner, so that we could be friends.	1	2	3	4	5	6
65. My practitioner is a comforting presence to me when I am upset.	1	2	3	4	5	6
66. My practitioner treats me more like a child, than an adult.	1	2	3	4	5	6
67. I often wonder about my practitioner's other clients.	1	2	3	4	5	6
68. I know my practitioner will understand the things that bother me.	1	2	3	4	5	6
69. It's hard for me to trust my practitioner.	1	2	3	4	5	6
70. I feel sure my practitioner will be there if I really need him/her.	1	2	3	4	5	6
71. I am not certain that my practitioner is all that concerned about me.	1	2	3	4	5	6
72. When I am with my practitioner I feel that I am his/her highest priority.	1	2	3	4	5	6

Please indicate the extent to which you agree or disagree with each of the following statements

1	2	3	4	5	6
strongly disagree	moderately disagree	slightly disagree	slightly agree	moderately agree	strongly agree

2. If I could magically remove all of my painful memories, I would ………………………... 1 2 3 4 5 6

3. When something upsetting comes up, I try very hard to stop thinking about it …………... 1 2 3 4 5 6

4. I sometimes have difficulty identifying how I feel ………………………………………. 1 2 3 4 5 6

7. Happiness means never feeling any pain or disappointment ……………………………… 1 2 3 4 5 6

9. When negative thoughts come up, I try to fill my head with something else ……………... 1 2 3 4 5 6

10. At times, people have told me I'm in denial ……………………………………………… 1 2 3 4 5 6

13. When I am hurting, I would do anything to feel better ...……...…………………………... 1 2 3 4 5 6

15. I usually try to distract myself when I feel something painful …………………………… 1 2 3 4 5 6

16. I am able to "turn off" my emotions when I don't want to feel …………………………… 1 2 3 4 5 6

19. Happiness involves getting rid of negative thoughts …………………………………….. 1 2 3 4 5 6

21. I don't realize I'm anxious until other people tell me …………………………………….. 1 2 3 4 5 6

22. When upsetting memories come up, I try to focus on other things ………………………... 1 2 3 4 5 6

23. I am in touch with my emotions …………………………………………………………... 1 2 3 4 5 6

25. One of my big goals is to be free from painful emotions ………………………………… 1 2 3 4 5 6

27. I work hard to keep out upsetting feelings ………………………………………………... 1 2 3 4 5 6

28. People have said that I don't own up to my problems ……………………………………. 1 2 3 4 5 6

31. I'd do anything to feel less stressed ……………………………………………………….. 1 2 3 4 5 6

33. When unpleasant memories come to me, I try to put them out of my mind ……………… 1 2 3 4 5 6

34. In this day and age people should not have to suffer …………………………………….. 1 2 3 4 5 6

35. Others have told me that I suppress my feelings …………………………………………. 1 2 3 4 5 6

38. My life would be great if I never felt anxious …………………………………………….. 1 2 3 4 5 6

40. When a negative thought comes up, I immediately try to think of something else ………. 1 2 3 4 5 6

41. It's hard for me to know what I'm feeling ………………………………………………... 1 2 3 4 5 6

44. I would give up a lot not to feel bad ………………………………………………………. 1 2 3 4 5 6

46. I can numb my feelings when they are too intense ………………………………………... 1 2 3 4 5 6

49. Some people have told me that I "hide my head in the sand" …………………………….. 1 2 3 4 5 6

50. Pain always leads to suffering …………………………………………………………….. 1 2 3 4 5 6

52. It takes me awhile to realize when I'm feeling bad ………………………………………. 1 2 3 4 5 6

54. I wish I could get rid of all of my negative emotions …………………………………….. 1 2 3 4 5 6

56. I feel disconnected from my emotions …………………………………………………….. 1 2 3 4 5 6

58. The key to a good life is never feeling any pain ………………………………………….. 1 2 3 4 5 6

60. People have told me that I'm not aware of my problems …………………………………. 1 2 3 4 5 6

61. I hope to live without any sadness and disappointment …………………………………... 1 2 3 4 5 6

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Consent form for participation in Acupuncture Research for Practitioners

This piece of is to help better understand how effective Acupuncture is at treating individuals' health problems. The research is conducted in the Psychology Department, University of Bedfordshire with the approval of the Research Centre for Applied Psychology and University Ethics Committees.

By signing this form you are consenting to take part in this piece of research. As a practitioner in this study you will be required to complete this quick questionnaire, the specific aim of collecting this data from you is to analyse the relationship between you and your patients to help better understand what impact this has on the outcomes of acupuncture treatment, if any.

To protect your data and your anonymity, please do not write your name anywhere on the question pages. Instead please fill in your name on the next sheet where indicated, detach this sheet from the questionnaire, and give both coversheet and questionnaire to the researcher. All information you provide will be treated with the strictest confidence and will only be reduced to numbers for statistical analysis. Throughout the analysis, your data will be identified via a code (top right) so that anonymity of the data is preserved.

Should you wish to withdraw from the trial you may do so at any time, even if you have already completed and submitted the questionnaire. If you wish to withdraw, require further information, or are interested in the findings of the study, feel free to email Ashley Bennett on ashley.bennett@beds.ac.uk or Dr. Antigonos Sochos on antigonos.sochos@beds.ac.uk, tel: 01234 400 400.

If you feel like you would like to talk to someone in confidence about something raised during participation in this trial please ask for more information.

We thank you greatly for your participation in this trial.

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First Name *(Please print)*:_____

Surname *(Please print)*:_____

I agree for data collected in the following questionnaires to be used as part of the study.

Signed:_____

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Part I Background Information

Age:_____

Gender (Please Circle):   M   F

Ethnicity: White [ ]   Bangladeshi [ ]   Pakistani   [ ]   Indian [ ]

Chinese [ ]

Black African [ ]   Black Caribbean [ ]   Other ....   Mixed Ethnicity ....

What is your first spoken language?_____
What is your second spoken language?_____ N/A [ ]
What is your third spoken language?_____ N/A [ ]
Please fill in the following questions to the best of your knowledge.

1. **How long have you been practicing acupuncture?** (in years)**:**_____

2. **What is your highest achieved academic qualification?**

    PhD [ ]   MBBS/MD [ ]   MSc [ ]   MA [ ]   PgDip/PgCert [ ]

    BSc [ ]   BA [ ]   Diploma [ ]   A-levels [ ]

    Other (please specify):_____

3. Have you <u>ever</u> been given the following diagnoses:

Irritable bowel syndrome [ ]   Pelvic pain [ ]   A psychiatric diagnosis [ ]

Fibromyalgia [ ]   Fibrositis [ ]   Low back pain [ ]

Chronic back pain [ ]   Tension headache [ ]   Chronic headaches [ ]

Atypical facial pain [ ]   Chronic fatigue (ME) [ ]   Palpitations [ ]

Post-viral fatigue syndrome [ ]   Non-cardiac chest pain [ ]

Non-ulcer dyspepsia [ ]   Dizziness [ ]   Insomnia [ ]

Mitral Valve Prolapse [ ]   Multiple Chemical Sensitivity [ ]   Globus [ ]

Sick Building Syndrome [ ]   Repetitive Strain Injury [ ]

Chronic Whiplash [ ]   Hyperventilation Syndrome [ ]

Pre-menstrual Syndrome [ ]   Vocal Cord Dysfunction [ ]

Temporomandibular Joint Disorder [ ]

8. If yes, how long ago? _____

Questionnaire Part IV

Please rate each paragraph according to the *extent* to which you think each corresponds to your general relationship style.

A. It is easy for me to become emotionally close to others. I am comfortable depending on them and having them depend on me. I don't worry about being alone or having others not accept me.

Not at all like me			Somewhat like me			Very much like me
1	2	3	4	5	6	7

B. I am uncomfortable getting close to others. I want emotionally close relationships, but I find it difficult to trust others completely, or to depend on them. I worry that I will be hurt if I allow myself to become too close to others.

Not at all like me			Somewhat like me			Very much like me
1	2	3	4	5	6	7

C. I want to be completely emotionally intimate with others, but I often find that others are reluctant to get as close as I would like. I am uncomfortable being without close relationships, but I sometimes worry that others don't value me as much as I value them.

Not at all like me			Somewhat like me			Very much like me
1	2	3	4	5	6	7

D. I am comfortable without close emotional relationships, It is very important to me to feel independent and self-sufficient, and I prefer not to depend on others or have others depend on me.

Not at all like me			Somewhat like me			Very much like me
1	2	3	4	5	6	7

Please indicate the extent to which you agree or disagree with each of the following statements

1	2	3	4	5	6
strongly disagree	moderately disagree	slightly disagree	slightly agree	moderately agree	strongly agree

2. If I could magically remove all of my painful memories, I would …………………….. 1 2 3 4 5 6

3. When something upsetting comes up, I try very hard to stop thinking about it …………... 1 2 3 4 5 6

4. I sometimes have difficulty identifying how I feel ……………………………………... 1 2 3 4 5 6

7. Happiness means never feeling any pain or disappointment …………………………….. 1 2 3 4 5 6

9. When negative thoughts come up, I try to fill my head with something else …………….. 1 2 3 4 5 6

10. At times, people have told me I'm in denial …………………………………………….. 1 2 3 4 5 6

13. When I am hurting, I would do anything to feel better ...……..………………………….. 1 2 3 4 5 6

15. I usually try to distract myself when I feel something painful ………………………….. 1 2 3 4 5 6

16. I am able to "turn off" my emotions when I don't want to feel ………………………….. 1 2 3 4 5 6

19. Happiness involves getting rid of negative thoughts ………………………………….… 1 2 3 4 5 6

21. I don't realize I'm anxious until other people tell me ………………………………….… 1 2 3 4 5 6

22. When upsetting memories come up, I try to focus on other things ……………………….. 1 2 3 4 5 6

23. I am in touch with my emotions ………………………………………………………... 1 2 3 4 5 6

25. One of my big goals is to be free from painful emotions ……………………………….… 1 2 3 4 5 6

27. I work hard to keep out upsetting feelings ……………………………………………... 1 2 3 4 5 6

28. People have said that I don't own up to my problems …………………………………….. 1 2 3 4 5 6

31. I'd do anything to feel less stressed …………………………………………………….… 1 2 3 4 5 6

33. When unpleasant memories come to me, I try to put them out of my mind ……………. 1 2 3 4 5 6

34. In this day and age people should not have to suffer ……………………………………... 1 2 3 4 5 6

35. Others have told me that I suppress my feelings ………………………………………….. 1 2 3 4 5 6

38. My life would be great if I never felt anxious …………………………………………….. 1 2 3 4 5 6

40. When a negative thought comes up, I immediately try to think of something else ………. 1 2 3 4 5 6

41. It's hard for me to know what I'm feeling ………………………………………………... 1 2 3 4 5 6

44. I would give up a lot not to feel bad …………………………………………………….… 1 2 3 4 5 6

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54. I wish I could get rid of all of my negative emotions …………………………………….. 1 2 3 4 5 6

56. I feel disconnected from my emotions …………………………………………………….. 1 2 3 4 5 6

58. The key to a good life is never feeling any pain ………………………………………….. 1 2 3 4 5 6

60. People have told me that I'm not aware of my problems ………………………………….. 1 2 3 4 5 6

61. I hope to live without any sadness and disappointment ………………………………….... 1 2 3 4 5 6

University of Bedfordshire

Research Graduate School
University of Bedfordshire
Park Square
Luton LU1 3JU

UNIVERSITY RESEARCH ETHICS COMMITTEE

06 September 2013

Re: **UREC13**
Ashley Bennett
"Traditional Chinese medicine, a solution to medically unexplained symptoms? A randomised
control trial and the role of attachment in TCM's therapeutic outcome"

Dear Mr Bennett
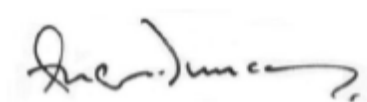
The above proposal was submitted to UREC for ethical approval. Further to your response to the concerns
raised by UREC which has been considered by the Committee under Chair's action, I am pleased to inform
you that ethical approval has been granted subject to:

1.   The project being carried out in accordance with the responses to concerns raised by UREC at
the June 2013 meeting (a copy is attached to this letter).
2.   Permission being sought from participants who are receiving treatment from their GP for medically
unexplained symptoms, for their GP to be informed of their patient's involvement in the project.
3.   Participants who are being treated by their GP for medically unexplained symptoms and who
refuse permission for their GP to be informed of their involvement in the project must be excluded
from the project.

Please confirm that these conditions have been met. Please note that if it becomes necessary to make
any substantive change to the research design, the sampling approach or the data collection methods a
further application will be required.

I wish you every success with your research.

With best wishes

Professor Angus Duncan
Head of Research Graduate School
01582 743473
angus.duncan@beds.ac.uk

Encs

Ashley Bennett

From:	Christopher Hand
Sent:	09 April 2014 16:22
To:	Ashley Bennett; ethics rcap
Cc:	Isabella McMurray
Subject:	RE: Ethics for study 2...

Hi,

I am satisfied with this proposal.

Best wishes,

Chris

From: Ashley Bennett
Sent: 03 April 2014 15:23
To: ethics rcap
Cc: Christopher Hand; Isabella McMurray
Subject: Ethics for study 2...

Hi,

Please find attached the ethics RA1 annex and the proposal document for my next study. I hope there will be enough information here, if not please email me and I will give more.

Cheers
Ashley

University of Bedfordshire

Mr. Ashley Bennett BSc MBPsS DCHAc
Department of Psychology
University of Bedfordshire
Park Square
Luton
LU1 3JU
Email. Ashley.bennett@beds.ac.uk

Thursday, 04 January 2018

Dear Dr. ***********

I am writing to inform you that ******* (DOB: **/**/****), a patient under your care has registered interest in taking part in a Randomised Control Trial that will require a 5 week course of acupuncture treatment.

As this patient is currently receiving treatment for a condition that could be considered under the umbrella of medically unexplained symptoms I felt it necessary to make you aware of their intent to participate, in the event you felt your current treatment may contraindicate acupuncture therapy,

Should there be any reason you feel that this patient should not receive this treatment please contact me using my information at the top of this letter. We will defer the commencement of the trial for one week for a response, should none arrive we will assume that we may begin.

Kind Regards

Mr. Ashley Bennett

Screening Questionniare

Q1 **Screening Questionnaire** Traditional Chinese Medicine - Acupuncture - Trial
Thank you for registering interest in this study. After completing this brief questionnaire more detailed information will be given to you before you decide whether or not to take part in this research. You will have the opportunity to ask questions and discuss anything with a qualified practitioner prior to agreeing to participate in this study.
The study will consist of you attending 5 free acupuncture sessions (aprrox. 45-60 min. long) at a clinic in Luton, about 5 min. walk from the main train station. You will be asked to fill in some questionnaires prior to your treatment course, then again in 5 weeks after your treatment and finally three months later as a follow up.
You will be selected randomly to receive either true acupuncture or placebo acupuncture, you will not be told which treatment you are receiving until after the follow up questionnaire has been completed. This trial is a double blind trial, so measures are taken to ensure that the practitioners and patients are unaware of whether they are receiving true or placebo acupuncture.If it turns out you were receiving placebo acupuncture we will give you 5 free genuine acupuncture treatments.
Your information will be held in strictest confidence and will not be shared with any third parties. If you are not chosen to take part in the study for any reason you will be informed and your information destroyed.
By ticking the 'yes' box below you agree to be contacted by a member of the research team to arrange appointments for your 5 free acupuncture sessions.
If you have any other questions that you would like to ask before or after completing this form please do not hesitate to contact: Ashley Bennett -
ashley.bennett@beds.ac.uk
Antigonos Sochos -   antigonos.sochos@beds.ac.uk

*

Q2 Do you agree to be contacted by a member of the research team to arrange your first appointment?

○ Yes (1)

○ No (2)

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Skip To: End of Survey If Do you agree to be contacted by a member of the research team to arrange your first appointment? = No

Page Break

Q3 Have you ever received acupuncture treatment?

○ Yes (1)

○ No (2)

Q4 Have you received acupuncture treatment in the last 5 years?

○ Yes (1)

○ No (2)

End of Block: Default Question Block

Start of Block: Block 2

Q5 Please answer the following questions as honestly as possible...

Q29 Are you currently receiving treatment for Medically Unexplained Symptoms (Please see the following list for conditions considered medically unexplained)?

If you are not <u>actively receiving treatment</u> for any of the conditions below please select NO

Irritable bowel syndrome   Pelvic pain   A psychiatric diagnosis   Fibromyalgia
Fibrositis   Low back pain   Chronic back pain   Tension headache
Chronic headaches   Atypical facial pain   Chronic fatigue (ME)   Palpitations   Post-viral fatigue syndrome   Non-cardiac chest pain   Non-ulcer dyspepsia   Dizziness
Insomnia   Mitral Valve Prolapse   Multiple Chemical Sensitivity   Globus Hystericus
Sick Building Syndrome   Repetitive Strain Injury   Chronic Whiplash
Hyperventilation Syndrome   Pre-menstrual Syndrome   Vocal Cord Dysfunction
Temporomandibular Joint Disorder

○ Yes (1)

○ No (2)

Q30 If you are currently **receiving treatment** for one of the above conditions we are obliged by the Ethics Committee of the University of Bedfordshire to inform your GP about your participation in the study.

We will not provide any other details, we will just inform them that you are taking part so that we ensure your safety and well-being throughout the trial. Are you happy for us to inform your GP of your participation in the trial?

○ Yes (1)

○ No (2)

Q31 Please provide your GP's details below.

○ Doctors Name (1) _____

○ Surgery Name (2) _____

○ Street (3) _____

○ City (4) _____

○ Postal Code (5) _____

Q6 Are you currently receiving treatment for cancer?

○ Yes (1)

○ No (2)

○ Don't know (3)

Q7 Do you have a blood born disease? (e.g., HIV, AIDS, Hepatitis)

○ Yes (1)

○ No (2)

○ Don't know (3)

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Q8 Are you currently pregnant or breastfeeding?

○ Yes (1)

○ No (2)

○ Don't know (3)

Q9 Have you undergone major surgery in the past 6 months? (e.g., Open heart, organ transplant, etc.)

○ Yes (1)

○ No (2)

○ Don't know (3)

Q10 Are you currently on any of the following medications?

☐ Warfarin (1)

☐ Heparin (2)

☐ Other anticoagulant (3)

Q11 Do you have haemophilia?

○ Yes (1)

○ No (2)

○ Don't know (3)

Q12 Do you have a needle phobia?

○ Yes (1)

○ No (2)

Q13 In the past 5 years have you:

☐ Been diagnosed with MAJOR depression, psychosis or bipolar disorder? (1)

☐ Been admitted to a psychiatric unit? (2)

End of Block: Block 2

Start of Block: Block 3

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Q21 Thank you for your time. You meet the inclusion criteria for this current study.

We just require a few details from you on the next few pages, please take your time to fill in this information correctly.

Once you have completed the following sections, you will be contacted shortly to book your first out of five FREE acupuncture appointments.

Thank you once again for your time, we look forward to seeing you soon.

P.S. -

If you know of anyone else who may benefit from taking part in this trial please forward them the link they you received!

Q22 We are really sorry however, it appears that you do not meet the criteria to take part in this study.

We really appreciate your time and interest in this study, if you have any questions or anything that you would like to discuss please contact ashley.bennett@beds.ac.uk

If you know of anyone else who may benefit from taking part in this trial please forward them the link they you received!

Q15
Contact information

In order for us to contact you to arrange your appointments please provide up to date information.

○ First Name (1) _____

○ Last Name (2) _____

○ Date of Birth (dd/mm/yyyy) (3)
_____

○ E-mail Address (4) _____

○ Primary Contact Number (5)
_____

○ Secondary Contact Number (6)
_____

○ What is the best time & method to contact you? (7)
_____

Q16 What is your gender?

○ Male (1)

○ Female (2)

Q17 Are you currently a student of the University of Bedfordshire?

○ Yes (1)

○ No (2)

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Q18 The trial is taking place in Luton (about a 5 min. walk from Luton train station) depending on appointment availability you may have to attend during evenings and weekends. Can you accommodate this?

   ◯ Yes (1)

   ◯ No (2)

- -

Q19 Are you currently involved in any other clinical or medical trials?
This may involve taking new medication.

   ◯ Yes (1)

   ◯ No (2)

Skip To: End of Block If Are you currently involved in any other clinical or medical trials?   This may involve taking new me... = No

End of Block: Block 2

Start of Block: Block 4

Q24 Please answer the following questions as honestly as possible remembering that you data is held in complete confidence.

- -

Q27 Please indicate if you have suffered with any of the following symptoms within the past month...
If you have had the symptom please state whether this was for less than 15 days or more than 15 days in the past month.

	Not at all (1)	presence for less than 15 days (2)	presence for more than 15 days (3)
Severe headaches (1)	○	○	○
Fluttering or movement in the stomach (2)	○	○	○
Pain / tension in the neck and shoulders (3)	○	○	○
Burning / itching skin all over (4)	○	○	○
Constriction of you head as if it were being gripped tightly from outside (5)	○	○	○
Pain in the chest or heart (6)	○	○	○
Mouth or throat feeling dry (7)	○	○	○
Darkness or mist in front of your eyes (8)	○	○	○
A burning sensation in your stomach (9)	○	○	○
A lack of energy (weakness) much of the time (10)	○	○	○
Head feeling hot or burning (11)	○	○	○
Sweating a lot (12)	○	○	○
Pressure or tightness on your chest or heart (13)	○	○	○

Suffering ache or discomfort in the abdomen (14)	○	○	○
A chocking sensation in your throat (15)	○	○	○
Hands or feet had pins and needles or gone numb (16)	○	○	○
Felt aches or pains all over the body (17)	○	○	○
A feeling of heat inside your body (18)	○	○	○
Palpitations (heart pounding) (19)	○	○	○
Pain or burning in your eyes (20)	○	○	○
Indigestion (21)	○	○	○
Trembling or shaking (22)	○	○	○
Passing urine more frequently (23)	○	○	○
Low back trouble (24)	○	○	○
Stomach feeling swollen or bloated (25)	○	○	○
Head feeling heavy (26)	○	○	○
Feeling tired, even when you are not working (27)	○	○	○
Pain in your legs (28)	○	○	○
Feeling sick in the stomach (nausea) (29)	○	○	○

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Pressure inside your head as if your head was going to burst (30)	○	○	○
Difficulty in breathing, even when resting (31)	○	○	○
Tingling (pins and needles) all over the body (32)	○	○	○
Constipation (33)	○	○	○
Wanting to open your bowels (go to the toilet) more often than usual (34)	○	○	○
Sweaty palms (35)	○	○	○
Difficulty in swallowing, as if there was a lump in your throat (36)	○	○	○
Feeling giddy or dizzy (37)	○	○	○
A bitter taste in your mouth (38)	○	○	○
Whole body feeling heavy (39)	○	○	○
Burning sensation when passing urine (40)	○	○	○
A buzzing noise in your ears or head (41)	○	○	○
The feeling of a weak or sinking heart (42)	○	○	○
Excessive wind (gas) or belching (43)	○	○	○

Hands or feet feeling cold (44)	○	○	○

Q28 These questions are just for men...

	Not at all (1)	presence for less than 15 days (2)	presence for more than 15 days (3)
Difficulty getting full erection (1)	○	○	○
Passing semen in your urine (2)	○	○	○

End of Block: Block 4

Psychological Distress, Physical Symptoms, and the Role of Attachment Style in Acupuncture

Antigonos Sochos, PhD, CPsychol, AFBPsS; Ashley Bennett, BSc, MBPsS, DCHAc

ABSTRACT

Context • Attachment research has contributed significantly to the understanding of the origins as well as the treatment of psychological and somatic distress; however, no study so far has explored the role of attachment in acupuncture. The effects on endogenous opioids of both acupuncture and intimate interpersonal bonding as well as clients' reliance on a practitioner's care may suggest that individual differences in attachment style could be linked to individual differences in responses to acupuncture.

Objective • The study intended to investigate the role of attachment style in determining outcomes in acupuncture.

Design • A pre- and postintervention, single group, quasiexperimental design was used.

Setting • Treatment and data collection took place in an acupuncture clinic in London, England, United Kingdom.

Participants: Eighty-two acupuncture clients with a mean age of 46 ± 14.53 y took part in the study. Participants suffered from a variety of somatic and psychological complaints.

Intervention • Traditional Chinese acupuncture was administered to all participants in weekly sessions, with the mean number of sessions that participants received being 5 ± 3.5.

Outcome Measures • Psychological distress and somatic symptoms were measured using the General Heath Questionnaire (GHQ-12) and the Bradford Somatic Inventory (BSI), respectively. The Relationship Questionnaire (RQ) was used to assess attachment style, with the 4 styles being secure, dismissing, preoccupied, and fearful.

Results • After treatment, both somatic and nonsomatic distress were reduced ($P < .001$), whereas pretreatment associations between attachment insecurity and symptom severity ceased to exist. The strength rather than the quality of the attachment style moderated the reduction in somatic distress, whereas the preoccupied style of attachment moderated the effects of medically unexplained symptoms on distress.

Conclusions • Attachment style may have an impact on acupuncture outcomes by predisposing individuals to different patterns of opioid elicitation and a different manner of relating to the practitioner. (*Altern Ther Health Med.* 2016;22(3):##-##.)

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Attachment theory is an important interpersonal framework suggesting that the attachment system is implicated in the origins and treatment of psychological distress as well as in the experience, communication, and alleviation of bodily pain and physical symptoms.[1,2] Attachment security is perhaps the most central concept of the theory, referring to the expectation that intimate others will be available at times of need and that the self will be able both to manage life's challenges and elicit caring responses from others. Attachment researchers argue that attachment styles are rooted in different caregiving experiences. Many researchers agree that the attachment experience is organized along the 2 fundamental dimensions of anxiety and avoidance, which define 4 attachment patterns or styles: (1) secure, (2) dismissing, (3) preoccupied or anxious, and (4) fearful.[3,4]

The secure style is characterized by low anxiety and low avoidance and is linked with the individual's ability to manage stress effectively and establish mutually supportive human relationships. The dismissing style is characterized by high avoidance and low anxiety and is linked with an attitude of self-sufficiency and the avoidance of emotional intimacy. The preoccupied or anxious style is characterized by low avoidance and high anxiety and is linked with overdependence, aggressiveness, and a restricted capacity for effective coping. The fearful style is characterized by high avoidance and high anxiety and is linked with intense conflict between approaching and distancing, high interpersonal aggression, and a chaotic engagement with the environment.

In addition to strong empirical evidence suggesting an association between the quality of attachment and the experience of psychological distress,[5] a number of studies have provided support for a link between attachment and the experience of physical pain. Some studies have found that physical contact with an attachment figure could increase the tolerance of experimentally induced pain[6] and that individual differences in the experience and management of bodily pain were related to individual differences in attachment style. Meredith et al[7] found that anxiously attached individuals exhibited lower pain thresholds, lower ability to control pain, and lower perceived control over pain. Those findings are consistent with animal research reporting that maternally deprived, adult rats responded to pain with greater pain affect than rats with no history of maternal deprivation.[8]

Moreover, an insecure attachment style has been related to more intense pain and greater disability in individuals suffering from arthritis,[9] migraines,[10] and other chronic pain.[2,11] Two studies have found that patients attending primary care with medically unexplained symptoms were more likely to have an insecure attachment style and to suffer from a depressive or anxiety disorder than those with medically defined illnesses.[12,13] Some researchers have claimed that such symptoms themselves are expressions of somatized distress.[14] Some studies have suggested that the early family environment and attachment to a caregiver are important for understanding the somatization of distress, whereas attachment security has been linked to psychotherapy outcomes among somatizing patients.[15,16]

Although the role of attachment style in the conventional treatment of both psychiatric and general medical disorders has been well documented,[5,17] no study so far has explored the role of attachment in acupuncture. Acupuncture consists of the needling of specific points on the body according to the medical concepts of meridian and the vital energy *qi* in traditional Chinese medicine (TCM). Substantial research has suggested that acupuncture brings about analgesic, anesthetic, and therapeutic effects in relation to a variety of health problems because needling and electrical stimulation positively interfere with neural pathways, neurotransmitters, and hormones that mediate autonomic regulation and pain relief.[18]

Despite limitations in methodology and reporting, studies on the effects of acupuncture on depression and anxiety have suggested that benefits can be obtained.[19,20] The evidence seems to identify increases in the levels of serotonin and enkephalins as the main underlying processes, although the exact mechanism by which such increases are attained is not well understood. Many reasons exist to believe that investigating the role of attachment in acupuncture could be relevant to treatment, both in relation to somatic pain and psychological distress.

Some empirical evidence has suggested that the analgesic and anti-inflammatory effects of acupuncture are attained mainly due to the elicitation of endogenous opioids that the body automatically generates to fight off pain.[18,21] Strong evidence also suggests that endogenous opioids are implicated in human and animal bonding as well as in the regulation of both physical and social pain. Some research has suggested that endogenous opioids, such as endorphins, are elicited in the presence of intimate others, generating subjective feelings of joy, whereas the absence of such opioids is linked with increased closeness- and care-seeking behavior.[22] Some researchers have argued that physical and social pain (eg, pain caused by social rejection) involve common neuroendocrinal and neurological systems, including the oxytocin and opioid systems, as well as the periaqueductal gray and the anterior cingulated cortex areas of the brain.[23]

The endogenous opioid system seems to be of particular importance, being the common thread between the regulation of pain and the regulation of intimate bonds. Although endogenous opioids function as analgesics that are produced by the human body to defend against pain, they also function as motivators in bonding. If the elicitation of endogenous opioids is not only a main mechanism through which acupuncture achieves its analgesic effects but also a major physiological motivator for the establishment of human bonds, individual differences in attaining such effects may relate to individual differences in attachment.

As systematic differences in parent-child interactions result in individual differences in the attachment styles of offspring, they may also result in different established patterns of opioid activation. Zeifman and Hazan[24] argue that early attachment relationships can condition the endogenous opioid system itself because repeated interactions with a caregiver could establish a pattern of endorphin activation so that both interpersonal bonding and pain regulation are facilitated. Such individual differences may result in differences not only in responding to the acupuncture needle itself but also in differences in responding to the acupuncturist as a person. Research has shown that the vulnerability that is a part of being a patient can activate the attachment system and that a range of health care professionals may be treated as attachment figures by their clients.[13,14]

The aim of the present study was to investigate the role of a client's attachment style in the acupuncture treatment of physical as well as psychological symptoms. Attachment

research strongly suggests a link between psychological and physical pain (ie, a link between the psyche and the body) and, as such, the research may provide useful insights into the effectiveness of an integrative treatment such as acupuncture. The current researchers also wished to explore whether acupuncture had any different effect on and whether attachment played different roles in the treatment of 2 types of patients, those with medically explained symptoms and those with symptoms that were not medically unexplained. Because somatic symptoms would seem to relate more strongly to psychological distress in the latter group, the research team wanted to see whether those clients would respond differently to acupuncture. To achieve the current study's aims, the research team formulated 3 hypotheses and 1 research question.

First, the team hypothesized that clients of Chinese acupuncture, after treatment, would experience a reduction in the symptoms of both somatic and psychological distress. Second, the team theorized that the experience of treatment would weaken the link between insecure attachment and symptoms of distress, so that predictive associations between attachment style and distress symptoms that had been observed before therapy would become insignificant after therapy. Third, the team hypothesized that attachment style would moderate the posttherapy reduction in both physical and psychological symptoms, and, therefore, that the more insecurely attached clients would experience less improvement. The team expected that the 2 main mechanisms that potentially are implicated in the acupuncture-treatment effect—the establishment of a facilitating client-practitioner relationship and the elicitation of the endogenous opioid system—would be relatively compromised among the more insecure clients.

Finally, the team wished to explore the extent to which clients requesting acupuncture suffered from functional somatic syndromes and the extent to which clients who suffered from those syndromes differed from clients with identifiable physical illnesses, including differences in physical symptoms, psychological distress, and attachment style. The current research team also wanted to find out whether those 2 groups of clients would respond to treatment differently and whether attachment style had a different effect on treatment outcomes in the 2 groups.

METHODS

The research team designed a pre- and posttreatment, nonrandomized study involving clients who received traditional Chinese acupuncture.

Participants

Eighty-two individuals with a mean age of 46 ± 14.53 years took part in the study. Participants were patients who sought acupuncture treatment at the AcuMedic Clinic of Traditional Chinese Medicine (London, England, United Kingdom) for a variety of complaints, such as back, chest, or stomach pains; migraines; and insomnia.

Participants were predominantly female (67%) and white (80%); other ethnicities included Asian (6%), Black African (4%), and Black Caribbean (5%).

The research team obtained both clients' and practitioners' consents for participation in the study. The study obtained ethical clearance from the AcuMedic Clinic and a the Department of Psychology at University of Bedfordshire (Luton, England, United Kingdom).

Procedures

Treatment was delivered by a total of 7 practitioners who were qualified in both TCM and Western medicine from institutions across China. The practitioners had at least 5 years of experience in delivering acupuncture. After obtaining their consents to participate and before treatment, participants were asked to complete a background questionnaire and the Relationship Questionnaire (RQ), an attachment-style questionnaire. Before their first and after their last sessions of acupuncture, participants also completed the General Health Questionnaire (GHQ-12) and the Bradford Somatic Inventory (BSI).

Intervention

Treatment included a mean of 5 ± 3.5 sessions of acupuncture, 1 per week with each session lasting approximately 45 minutes. The maximum number of sessions was 16. However, data collection itself lasted longer than that, as not all treatments happened at the same time. Each time, the number and location of the acupuncture points were decided by the practitioner, depending on the client's presenting problem.

Outcome Measures

In addition to demographic and health background information, the following self-report questionnaires were used.

General Health Questionnaire.[25] The GHQ-12 is a widely used instrument, demonstrating good scale and test-retest reliability, with $\alpha = 0.94$ in the current study, as well as convergent, discriminant, and criterion validity.[26] The questionnaire's 12 items are scored on a 4-point Likert scale (0–3). Most studies, including the present one, have used GHQ-12 as a unidimensional index of nonpsychotic psychological distress.

Bradford Somatic Inventory.[27] The BSI is a 46-item questionnaire measuring physical symptoms of psychological distress, which has been validated in white and a variety of ethnic-minority groups in the United Kingdom. It identifies 7 common areas of somatic symptoms, forming an equal number of subscales: (1) head—7 items, $\alpha = 0.82$; (2) chest—5 items, $\alpha = 0.79$; (3) abdomen—6 items, $\alpha = 0.84$; (4) fatigue—7 items, $\alpha = 0.76$; (5) heat—3 items, $\alpha = 0.55$; (6) globus—3 items, $\alpha = 0.73$; and (7) panic—3 items, $\alpha = 0.66$. It also includes a measurement for an overall scale ($\alpha = 0.94$). In the present study, a 5-point Likert scale to measure the intensity of symptoms was used, and the results for the BSI correlated well with those for the GHQ-12—$r = 0.52$, $P < .001$, $df = 80$ pretreatment and $r = 0.47$, $P < .001$, $df = 80$ posttreatment.

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Relationship Questionnaire.[3] The RQ is a classic questionnaire measuring adult attachment style. Numerous studies have provided evidence for its convergent, discriminant, and predictive validity.[28] The questionnaire includes 4 small paragraphs, each providing a different attachment-related description of self and other. Using a 7-point Likert scale, each of the paragraphs measures the extent to which participants present the characteristics of 4 attachment styles: secure, dismissing, preoccupied, and fearful. The styles characterize 4 models of self and others: (1) secure style—positive model of self and others, (2) dismissing style—positive model of self and negative model of others, (3) preoccupied style—a negative model of self and a positive model of others, and (4) fearful style—negative model of both self and others.

Statistical Analysis

To address the 3 hypotheses, the research team used the following measures: (1) first hypothesis—2 repeated measures, multivariate analyses of variance (MANOVAs), comparing pre- and posttreatment symptom scores; (2) second hypothesis—a series of linear regressions, using each of the 4 attachment styles as predictors or independent variables and all pre- and posttreatment BSI and GHQ scales as dependent variables and controlling for age and gender as well as for GHQ or BSI pretreatment scores as accordingly; and (3) third hypothesis—moderated regressions, using each time the pretreatment symptom score as the independent variable, the posttreatment score as the dependent variable, and each of the 4 attachment styles as the moderator and controlling for age, gender, GHQ or BSI pretreatment scores, and the remaining 3 attachment styles.

To compare clients who had medically unexplained symptoms with those whose symptoms were medically explained with respect to the study's variables, the research team conducted a MANOVA. To investigate whether a participant's group moderated his or her treatment outcome and whether attachment style moderated the effect of the participant's group on posttherapy distress, the research team also conducted a moderated regression.

RESULTS

The first hypothesis proposed that clients of Chinese acupuncture, after treatment, would experience a reduction in both somatic and psychological distress symptoms. The first analysis revealed that posttreatment scores for both the BSI_{total} and GHQ_{total} scales were significantly lower than those at pretreatment, with Hotelling's trace = 0.971, $F_{2,80} = 38.85$, $P < .001$ (Table 1). The second analysis included only the BSI subscales and indicated that all posttreatment scores were significantly lower than those at pretreatment, with Hotelling's trace = 0.75, $F_{7,75} = 8.03$, $P < .001$. The mean pretreatment GHQ score was 12.36 (ie, above 11/12), which is regarded as a clinical threshold.[29] After treatment the mean GHQ score dropped to 7.55. No similar threshold was available to evaluate the BSI.

The second hypothesis proposed that the experience of treatment would weaken the link between insecure attachment and symptoms of distress so that the predictive associations between attachment style and distress symptoms that had been observed before therapy would become insignificant after therapy. According to the findings (Table 2), all but 1 of the statistically predictive associations between attachment styles and distress symptoms that had been observed to be significant before therapy were not significant after therapy. The only

Table 1. Descriptive Statistics of the Study's Variables

Variable	Pretreatment Mean ± SD (total)	Posttreatment Mean ± SD (total)
GHQ/Total	12.36 ± 6.79	7.55 ± 5.11
BSI/Total	27.85 ± 22.25	16.83 ± 13.06
BSI/Heat	2.07 ± 2.98	0.78 ± 1.08
BSI/Chest	1.22 ± 1.82	1.22 ± 1.82
BSI/Abdomen	4.64 ± 4.75	2.65 ± 2.66
BSI/Fatigue	7.35 ± 4.73	4.82 ± 3.86
BSI/Head	3.00 ± 3.98	1.67 ± 2.05
BSI/Globus	1.61 ± 2.05	1.14 ± 1.43
BSI/Panic	1.51 ± 2.06	0.79 ± 1.34
RQ/Secure	4.31 ± 1.80	
RQ/Dismissing	3.61 ± 1.75	
RQ/Preoccupied	2.48 ± 1.67	
RQ/Fearful	2.72 ± 1.65	

Abbreviations: SD, standard deviation; GHQ, General Health Questionnaire; BSI, Bradford Somatic Inventory; RQ, Relationship Questionnaire.

Table 2. Predictive Associations Between Attachment Style and Symptoms Before and After Treatment

Attachment Predictors	Outcome Scales	Pretreatment β	Pretreatment P	Posttreatment β	Posttreatment P
Fearful	BSI/Total	0.27	.003	0.15	.130
	BSI/Heat	0.28	.012	0.05	.686
	BSI/Head	0.23	.015	0.10	.334
	BSI/Globus	0.26	.030	0.10	.375
	BSI/Panic	0.26	.030	0.10	.375
	BSI/Chest	0.31	.003	0.27	.014
Preoccupied	BSI/Total	0.24	.012	0.09	.386
	BSI/Abdomen	0.21	.044	0.06	.582
	BSI/Fatigue	0.33	<.001	0.13	.211
Secure	BSI/Total	-0.08	.396	-0.25	.011
	BST/Chest	-0.15	.152	-0.27	.15
	BSI/Panic	-0.03	.788	-0.27	.013
Dismissing	GHQ/Total	-0.25	.012	-0.19	.075

Abbreviations: BSI, Bradford Somatic Inventory; GHQ, General Health Questionnaire.

Table 3. Moderating Effects of Attachment Style on Changes from Pre- to Posttreatment for BSI Score

Dependent Variable	Predictor Variables	β	P	R²	Adjusted R²	ΔF (P)	df
BSI-Post Total	Step 1						
	Age	-0.086	.403				
	Gender	0.071	.493				
	GHQ-Pre	0.372	.001				
	Dismissing	-0.124	.293				
	Fearful	0.193	.087				
	Preoccupied	0.091	.391	0.26	0.20	4.46 (P = .001)	6, 75
	Step 2						
	BSI-Pre Total	0.591	<.001				
	Secure	-0.226	.013	0.50	0.45	9.13 (P < .001)	8, 73
	Step 3						
	BSI-Pre Total (Secure)	-0.841	<.001	0.60	0.55	12.06 (P < .001)	9, 72
BSI-Post Total	Step 1						
	Age	-0.127	.207				
	Gender	0.063	.533				
	GHQ-Pre	0.424	<.001				
	Secure	-0.249	.014				
	Preoccupied	0.078	.452				
	Dismissing	-0.54	.609	0.294	0.237	5.20 (P < .001)	6. 75
	Step 2						
	BSI-Pre Total	0.591	<.001				
	Fearful	-0.031	.764	0.500	0.445	9.13 (P < .001)	8, 81
	Step 3						
	BSI-Pre Total (Fearful)	-1.048	.000	0.627	0.581	13.47 (P < .001)	9, 81
BSI-Post Total	Step 1						
	Age	-0.127	.204				
	Gender	0.067	.504				
	GHQ-Pre	0.415	<.001				
	Secure	-0.221	.036				
	Dismissing	0.119	.303				
	Fearful	-0.087	.444	0.299	0.242	5.32 (P < .001)	6, 81
	Step 2						
	BSI-Pre Total	0.591	<.001				
	Preoccupied	-0.045	.620	0.500	0.445	9.13 (P < .001)	8, 81
	Step 3						
	BSI-Pre Total (Preoccupied)	-0.973	<.001	0.617	0.569	12.89 (P < .001)	9, 81
BSI-Post Total	Step 1						
	Age	-0.118	.246				
	Gender	0.080	.416				
	GHQ-Pre	0.429	<.001				
	Secure	-0.224	.033				
	Fearful	0.074	.479				
	Preoccupied	0.058	.578	0.296	0.240	5.26 (P < .001)	6, 81
	Step 2						
	BSI-Pre Total	0.591	<.001				
	Dismissing	0.286	.286	0.500	0.445	9.13 (P < .001)	8, 81
	Step 3						
	BSI-Pre Total (Dismissing)	-0.825	<.001	0.598	0.548	11.90 (P < .001)	9, 81

Abbreviations: BSI, Bradford Somatic Inventory; GHQ, General Health Questionnaire.

Table 4. Moderating Effects of Attachment Style on Changes in Pre- to Posttreatment Score in Relation to Specific BSI Subscales

Interaction Terms	Outcome Scales	β	P	F	P
BSI/Head (Secure)	BSI/Head	-0.51	.016	8.35	.000
BSI/Head (Fearful)	BSI/Head	-0.89	.0001	11.90	.000
BSI/Head (Preoccupied)	BSI/Head	-0.05	.0186	8.29	.000
BSI/Head (Dismissing)	BSI/Head	-0.05	.0161	8.35	.000
BSI/Chest (Secure)	BSI/Chest	-0.07	.0033	9.83	.000
BSI/Chest (Fearful)	BSI/Chest	-0.10	.0001	11.36	.000
BSI/Chest (Preoccupied)	BSI/Chest	-0.07	.0277	9.02	.000
BSI/Chest (Dismissing)	BSI/Chest	-0.06	.0425	8.73	.000
BSI/Abdomen (Secure)	BSI/Abdomen	-0.05	.0352	9.17	.000
BSI/Abdomen (Fearful)	BSI/Abdomen	-0.09	.0000	12.35	.000
BSI/Abdomen (Preoccupied)	BSI/Abdomen	-0.07	.0069	9.88	.000
BSI/Abdomen (Dismissing)	BSI/Abdomen	-0.59	.0143	9.56	.000
BSI/Fatigue (Secure)	BSI/Fatigue	-0.08	.0214	10.92	.000
BSI/Fatigue (Fearful)	BSI/Fatigue	-0.07	.0484	10.55	.000
BSI/Fatigue (Dismissing)	BSI/Fatigue	-0.09	.0064	11.49	.000
BSI/Heat (Secure)	BSI/Heat	-0.08	.0012	8.84	.000
BSI/Heat (Fearful)	BSI/Heat	-0.08	.0017	8.70	.000
BSI/Heat (Preoccupied)	BSI/Heat	-0.12	<.001	13.05	.000
BSI/Heat (Dismissive)	BSI/Heat	-0.07	.0033	8.42	.000
BSI/Globus (Secure)	BSI/Globus	-0.10	.0063	4.18	.000
BSI/Globus (Fearful)	BSI/Globus	-0.11	.0003	5.20	.000
BSI/Globus (Preoccupied)	BSI/Globus	-0.10	.0007	4.90	.000
BSI/Globus (Dismissive)	BSI/Globus	-0.11	.0006	4.94	.000
BSI/ Frequency (Fearful)	BSI/Frequency	-0.10	.0001	13.96	.000
BSI/Frequency (Preoccupied)	BSI/Frequency	-0.08	.0090	11.26	.000
BSI/Panic (Secure)	BSI/Panic	-0.12	.0000	21.00	.000
BSI/Panic (Fearful)	BSI/Panic	-0.08	.0008	12.67	.000
BSI/Panic (Preoccupied)	BSI/Panic	-0.07	.0108	14.9	.000
BSI/Panic (Dismissive)	BSI/Panic	-0.10	.0001	17.31	.000

Abbreviation: BSI, Bradford Somatic Inventory.

association that remained significant was that between the fearful attachment style and chest-related symptoms, although the association was significant at the .05 rather than the .01 level. The fearful attachment style was the one with the most pretherapy associations, of which all but 1 involved the BSI scales. The dismissing attachment style was the one not linked with any BSI variables and was the only one to be associated with the GHQ, but only before treatment. The secure attachment style became negatively associated with BSI after treatment.

The third hypothesis proposed that a participant's attachment style would moderate the posttherapy reduction of both physical and psychological symptoms so that the more insecurely attached clients would experience less improvement. The findings suggested that all attachment styles moderated the effects of pretreatment scores on post-treatment scores but only in relation to the BSI (Table 3 and Table 4). More specifically, individuals with the highest attachment scores before treatment had lower posttreatment BSI scores compared with those with lower scores on the same attachment style. Differences in attachment style had no effect on the posttreatment reduction in the GHQ.

The research team also wished to explore the extent to which clients requesting acupuncture suffered from functional somatic syndromes and the extent to which clients who suffered from those syndromes differed from clients with identifiable physical illnesses, including differences in physical symptoms, psychological distress, and attachment style. Exploring the question, the team noted that 40 clients (48%), according to their self-reports, had received at least 1 functional syndrome diagnosis by their GP and 35 (42%) had been diagnosed with a medically explained physical condition. A further 7 clients (8%) suffered from an anxiety or mood disorder without a comorbid physical disorder and were not included in the analyses addressing the research question.

The research team found no differences between the 2 groups (ie, functional syndrome diagnosis vs medically explained diagnosis) (1) on any of the symptom scales, either before treatment (Wilks=0.93, $F_{6,68}$=0.73, P=.620) or after treatment (Wilks = 0.98, $F_{6,72}$ = 0.49, P = .615) and (2) on attachment style. Moreover, the presence of a diagnosed functional syndrome did not moderate the reduction of any type of symptom; the interaction term in relation to the GHQ was marginally nonsignificant, P=.053. However, the preoccupied attachment style moderated the effects of the type of diagnosis on posttreatment GHQ scores. Although relatively high preoccupation score was linked with lower posttreatment distress among clients with a medically explained diagnosis, it was linked with higher distress among those with a medically unexplained syndrome—$F_{10,64}$ = 5.01, P < .001; interaction β = -0.56, P = .016. No other attachment style moderated the effects of type of diagnosis on posttreatment distress.

DISCUSSION

According to the current study's findings, the participants reported less somatic and nonsomatic distress after receiving traditional Chinese acupuncture, whereas the predictive associations between attachment insecurity and the symptom scores changed after treatment. Moreover, the strength rather than the quality of the attachment style seemed to moderate the reduction in somatic distress because participants with higher scores in any attachment style reported lower scores on distress after treatment. Approximately 48% of the current study's sample had been diagnosed with at least 1 functional syndrome, but that subgroup did not differ in the results on symptom scores or attachment style from those with no such diagnosis. No moderating effects of a functional syndrome diagnosis on the reduction of symptoms were found, but the preoccupied attachment style did moderate the effects of the type of diagnosis on psychological distress.

The posttreatment reduction of symptoms observed in the current study appears consistent with the results show found in the previous literature that has reported therapeutic effects for acupuncture on depression,[20] anxiety,[19] and somatic symptoms of various other etiologies.[30] In those studies, acupuncture was found to increase the levels of serotonin and enkephalin in the brain, which could also account for the reductions in depression and anxiety in the present study. On the other hand, the analgesic effects of acupuncture as indicated by the reduced body pain and discomfort that the current participants reported possibly could be attributed to the elicitation of the body's endogenous opioids, as has been suggested by previous research.[18]

The Western scientific understanding of the analgesic action of endogenous opioids seems compatible in some respects with TCM's notion of acupuncture as affecting the body and mind by unblocking energy flow. According to scientific research, endogenous opioids attain their therapeutic effects by triggering biochemical activity in the nervous system. Although understood in different conceptual and sociocultural contexts, the traditional Chinese notion of energy flow and the scientific evidence of biochemical response as the results to acupuncture needle insertion seem to describe processes with some common characteristics.

However, the absence of a placebo or other no-treatment control group and the lack of controls for extraneous variables in the present study require that the possible causal mechanisms be considered with caution. It is possible that posttreatment changes were brought about by factors other than treatment, such as changes in current life stressors, the availability of social support, the effects of medication or other complementary and alternative therapies, or the number of acupuncture points used. Although previous studies have suggested some placebo effects in acupuncture, they also have indicated that the effect could explain only part of posttreatment improvement.[29] In a recently completed, double-blind, randomized trial, the current research team found that clients receiving real acupuncture attained a greater reduction in their BSI and GHQ scores compared to a placebo group receiving sham acupuncture.[31]

Moreover, the changes that were observed in the associations between attachment styles and symptom scores before and after treatment provide further evidence that treatment may have had a therapeutic effect in the current study. Such changes suggest that somehow acupuncture protected the participants from the vulnerability toward somatic distress that is linked with attachment insecurity. Previous studies have associated interpersonal rejection, an experience central in both preoccupied and fearful attachment, with a deficit in opioid function.[22] If the needle stimulation released endogenous opioids in preoccupied and fearful clients in the current study, then their attachment vulnerability may have been removed after treatment, at least partly and/or at least temporarily. Secure individuals, who did not present such deficits, may have been able to attain a further opioid elicitation, resulting in negative posttreatment associations between security and somatic symptoms.

On the other hand, individuals with the dismissing attachment type appeared unable to make gains in relation to somatic distress. The lack of association between the dismissing style and somatic distress and that style's negative association with nonsomatic distress that was observed before treatment were consistent with previous studies.[32] As those other studies have suggested, although the deactivation of the attachment system employed by dismissing individuals is defensive and limits their capacity for optimum psychosocial functioning, it does increase their competence in dealing with external stressors and protects them from psychological distress, at least to some extent.

However, attachment deactivation also involves at least some deactivation of the opioid system. As a result of their by-default suppressed opioids, acupuncture may have had some limited success with dismissing individuals in eliciting those substances and may have achieved a therapeutic effect similar to that attained by the secure. Moreover, the absence of an association between the dismissing style and the GHQ after treatment perhaps suggests that those participants with low scores on that style (ie, those less protected by dismissiveness) could have attained greater posttreatment increases in their serotonin and enkephalin. The lack of association between the other 2 insecure attachment styles and GHQ may suggest that preoccupied and fearful attachment in the current sample of acupuncture clients constituted a vulnerability factor toward developing somatic rather than nonsomatic distress.

In addition to opioid elicitation, it is possible that a placebo effect was attained also through a client's interpersonal relationship with a practitioner. Many studies have suggested that a good client-professional relationship is linked with positive outcomes in both mental and general health interventions.[33] Researchers have claimed that such relationships implicate the attachment system because patients are in a vulnerable, child-like position and health care professionals are in a supportive, parent-like role, often able to provide security and reassurance.[34] Although more difficult to achieve, relationships of trust can also develop in short-term interventions, such as the present one. The above associations between distress and the preoccupied, secure, and dismissing styles are consistent with such a hypothesis, whereas those involving the fearful are less so, given the inconsistent ways in which fearful clients engage with health professionals.[13]

Interesting also were the findings related to the current research team's third hypothesis, suggesting that it was the strength rather than the style of attachment that amplified the treatment effect. According to the current findings, the analgesic effects of acupuncture seemed to be stronger in those individuals who employed a particular attachment strategy more strongly, regardless of what that strategy was. It may be the case that as the clients' attachment system was activated in the context of the therapeutic relationship, so were their endogenous opioids, facilitating further elicitation through needle stimulation. Although the dismissing style

involves the defensive deactivation of the attachment system, such deactivation is attained only at later stages of emotional processing.[30] At the first most basic and biologically prepared stage, in the presence of relevant stimuli, the attachment system is activated automatically at an autonomic physiological level, without previous learning. It is reasonable, therefore, to expect some or even a minimal degree of opioid activation in dismissive individuals when they voluntarily seek care. Nonetheless, at the current point, those postulations are tentative, because neither opioids nor attachment to the practitioner were measured directly in the present study.

Finally, the absence of differences between the medically unexplained and medically explained groups in distress-related variables is not surprising, because both subgroups appear to belong to a larger, clinically distressed client sample. Nonetheless, the preoccupied style seemed to influence the treatment outcome in relation to nonsomatic distress in reverse ways in the 2 groups. Perhaps high attachment preoccupation hindered a positive treatment outcome among clients with unexplained medical symptoms compared to those without such known symptoms because the former group may have had a longer history of unsuccessful consultations with health professionals. Such a history may have increased mistrust and felt rejection among highly preoccupied clients with unexplained medical symptoms, making it more difficult for them to engage with acupuncture, both at a behavioral and a neurophysiological level.

Present findings suggest that investigating acupuncture from an attachment perspective can highlight the relevance of psychosocial processes in complementary and alternative therapies and can provide further support for the holistic approach to health and illness that those therapies advocate. The current study has provided further evidence that health and illness need to be understood from a wider biological-psychological-social perspective because they implicate biological, intrapersonal, interpersonal, and wider sociocultural processes that are intrinsically linked with how individuals acquire vulnerability, experience illness, and respond to professional treatment.

The current study is the first to investigate the role of attachment style in acupuncture, and it has generated some potentially interesting findings. However, a number of limitations render those findings tentative and invite further research in the area. The lack of a control group and the absence of controls for extraneous variables make the accounts of what changed after treatment and how those changes occurred provisional, underlining the necessity for randomized trials in the future. In addition, the study included participants suffering from a wide variety of symptoms, making it difficult to know if particular client groups are more or less receptive to the effects of acupuncture and attachment style. Future research needs to differentiate between specific client groups and investigate any distinct ways in which those clients may be affected by acupuncture and attachment style. Finally, because exogenous opioids and attachment to the practitioner were not directly measured in the current study, the accounts provided need to be verified by future studies measuring those important variables.

On the basis of the present findings, future studies could shed more light into how differences in attachment style are linked with differences in neurophysiological functioning, particularly the functioning of endogenous opioids. As a number of neurotransmitters and hormones are implicated in the processes of both physical healing and interpersonal bonding, attachment research may enrich scientists' understanding of how individuals with different developmental histories have their psychophysiological processes organized differently and how they are likely to respond to mainstream and alternative medicine in diverse ways.

CONCLUSIONS

Attachment style may affect acupuncture outcomes by predisposing individuals to different patterns of opioid elicitation and a different manner of relating to the practitioner. If this is the case, the quality of the practitioner-client relationship in acupuncture may warrant further attention. This new area of research could provide additional insight into how psychosocial and biological processes interact not only in compromising individual well-being but also in facilitating therapeutic intervention. Current findings provide further support for the appropriateness of a holistic approach to the treatment of psychological distress and somatic pain.

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