The Effects of Patients' Expectations on the Rehabilitation Process

Thesis submitted in accordance with the
requirements of the University of Liverpool
for the degree of Doctor of Philosophy

by

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First submission: September 1997
Revised submission: October 1999

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ACKNOWLEDGEMENTS

This thesis has taken nine years to complete and it will stay me for the rest of my life. In that time I have been fortunate to work with people who have always believe in and encouraged me along this path. This includes my supervisory team in the Department of Psychology (Ann Davies and Ev Thornton) and many other people in my life.

There are some, who have given verbal encouragement, for which I am grateful. There are also those who have done more than just empathise. From the beginning, probably even from before the beginning David Barer has been responsible for capturing my interest in stroke and has helped to formulate the early ideas of "expectations". He has always been there, in person, on the end of a phone or just in my head. To him I will be eternally grateful. His partner in crime, Yiannis Ellul, was always my ally to try to stop me working too hard and whose sense of humour and sense of fun has kept me going. They are both very close to my heart, but I do wish they would stop eating all of that salt!

I have had a lot of distractions over the years, some of it to do with more pressing projects at work, but also to do with meeting Kevin, my lovely husband, who appeared from nowhere (lets face it how many people have heard of Hounslow) to rescue me from the depths of despair and loneliness. To him I, literally, owe my life and now I can give him the attention that he so richly deserves. Little did I know when I first wrote this that soon he would go through the harrowing experience of having cancer requiring extensive chemotherapy. Somehow now I feel he deserves even more attention.

Despite Kev's own problems he has been immensely supportive to me through the death of my brother last year. This had such an impact on my mother, that we very nearly lost her as well. "Em", as those close so fondly call her, has herself recently been fighting cancer. Her cheerfulness and determination has been a source of inspiration for me as I have struggled to focus on the corrections for this thesis.

Five years or so ago I moved jobs to work for a man, without whom I would not have progressed. Anil Sharma has allowed me the room to grow professionally and to complete this thesis. He has always believed, right from the start that I could do it. Together we have built up stroke research at Aintree, in a small amount of time and with an even smaller amount of space! It is there that the majority of the work for the main study has been done, which would have been impossible without the help of my "charges"; Hazel Dickinson, Kevin McDonald and Liz Lightbody.

My biggest "charge" and the one I have known since I was an undergraduate, Michael Leathley, has kept me sane and has been there for me for these last few years. Without him I would never have managed to get to this point and I do not know how I can ever thank him enough for spending so much time with me (or his wife, Sheila for allowing him to do so and not asking for a divorce, well just yet!).

My personal clinical psychologist, Carol Deans is also responsible for me still being here today. She has always been there supporting me through my under- and post-graduate years. She has also never been averse to sharing the odd bottle of gin.

My family are always there when I want them, and have the sense to stay away when I don't. Unfortunately, my Dad died at the end of the second year of my degree and. though he was a real old bugger at times, I miss him immensely. However, I know he's always there, he may have lost his feathers, but every time I see a rainbow I'm reminded of his continuing presence. Thanks Dad for making me the person that I am.

ABSTRACT

C.L. Watkins "The Effects of Patients' Expectations on the Rehabilitation Process"

The aim of this thesis was to examine the relationship between predictions and expectations of recovery from stroke from both a clinician's and an individual patient's perspective.

Therapists predictions of recovery for individual patients following stroke were compared to actual outcome at 3 months post-event in a cohort of people admitted to hospital following a stroke. The findings of previous researchers were confirmed. Although a statistically significant relationship was demonstrated between therapist's predictions and actual outcome as indicated by the Barthel score at 3 months (using the Barthel score at day 7: tau-b=0.49, $p<0.0001$ or a Global prediction:tau-b=0.20, $p<0.05$), the relationship between predicted and actual Barthel scores were insufficiently robust (accounting for less than 35% of the variance) to allow their future use in clinical practice to allocate therapy.

The possibility that patients may also make their own predictions about the future was also explored. As an initial step a qualitative study was performed which aimed to identify patient's expectations of recovery in terms of what they believed would help them to achieve their desired goals and what would actually happen in the future. Eleven themes were identified; motivation, coping, self-esteem, mood/affect, fate, treatment, function, behaviour, environmental, cognitive and interpersonal relationships.

The data from this qualitative study were utilised to develop a 44 item questionnaire to allow the exploration of the relationship between patient's expectations and outcome in a structured way. The 11 themes, each having 4 sub-themes were represented in the questionnaire by statements generated by the patients themselves.

The questionnaire was administered in the first 4 weeks post-stroke to a cohort of 178 people (without severe cognitive and communication problems, median age 71, interquartile range 64-78, 99 males, 79 females) admitted to a District General Hospital.

Respondents were required to select 1 of 5 alternative responses which ranged from "not at all" to "a great deal" in response to each of the 44 statements, in answer to the 2 questions:

1) *"How much do you believe that this will help you to get better?"* (SEQ Help)
2) *"How much do you believe that this will happen in the future?"* (SEQ Happen)

Factor analysis was utilised to explore the factor structure of the original multi-dimensional questionnaire. Only one robust factor was identified (accounting for approximately 20% of the variance, internal consistency for SEQ Help=0.83, for SEQ Happen=0.83 and for both combined=0.89). The resultant 15 item uni-dimensional scale reflected; self-determination, self-efficacy and competence.

The predictive validity of this questionnaire, with responses reflecting beliefs about both what will "Help" and what will "Happen" was tested in a cohort of the original sample (those who were still inpatients in the second week post-stroke, N=128). These 128 people

(median age 73, interquartile range 64-78, 67 males, 61 females) were followed up throughout their hospital stay, at discharge and at 3 months post-stroke. Their expectations were explored in the context of demographic (age and sex), situational (features and severity of stroke) and some individual difference/person variables (functional and emotional consequences of the stroke), with survival, functional and emotional outcome.

Initial analyses demonstrated a significant correlation between SEQ Happen in week 2 and functional outcome at 3 months ($r=0.23$, $p<0.02$) with higher SEQ Happen scores being associated with better functional outcome. The relationship between SEQ Happen and emotional outcome was less clear (for the MADRS: $r=-0.23$, $p<0.06$; for the GHQ 28: $r=-0.18$, $p<0.09$). The relationships between SEQ Help at week 2 and functional and emotional outcomes at 3 months were not significant ($p>0.05$).

Multi-variate analyses demonstrated that the strongest predictor of mortality and morbidity (functional and emotional outcome) at 3 months post-stroke was initial severity of stroke (Barthel at day 7). Nevertheless, outcome could be predicted more accurately by including several other variables such as SEQ Happen.

In multiple regression analyses, the best model for predicting outcome in terms of Barthel at 3 months included; Barthel at day 7, age and SEQ Happen scores. However, this model only accounted for 40% of the variance. Models predicting emotional outcome in terms of either the MADRS or GHQ 28 could not account for more than 10% of the variance.

Using logistic regression analyses to predict good (alive/independent/not depressed) or bad outcome (dead/dependent/depressed), the best model included 4 variables; age, pre-stroke Rankin, Barthel score at day 7 and SEQ Happen at week 2. This model had; a sensitivity of 94%, a specificity of 47% and an overall accuracy of 80%.

These results suggest that the way that patients think, as well as the severity of the stroke, may affect rehabilitation and eventual outcome following stroke. However, further testing of these models in different cohorts is necessary in the future. Should expectations be shown to be a robust indicator of future outcome following stroke, research would then be required to determine if changing expectations would subsequently alter functional and/or emotional outcome.

LIST OF PUBLICATIONS

Watkins C, Leathley M;1998; The Stroke Expectations Questionnaire (SEQ): Identification of patients' ideas about recovery; Platform Presentation, European Congress for Research in Rehabilitation, Berlin, Germany.

Leathley M, Watkins C;1998; The Stroke Expectations Questionnaire (SEQ): A predictor of outcome?; Platform Presentation, European Congress for Research in Rehabilitation, Berlin, Germany.

Watkins CL, Leathley MJ, Davies A; 1998; The Stroke Expectations Questionnaire (SEQ): A predictor of outcome?; Clinical Rehabilitation; 12 (2): 173, (presented to Society for Research in Rehabilitation, 1997).

Watkins CL, Leathley MJ, Davies A; 1998; The Stroke Expectations Questionnaire (SEQ): Identification of patients' ideas about recovery; Clinical Rehabilitation; 12 (2): 173-174, (presented to Society for Research in Rehabilitation, 1997).

Watkins CL, Ellul J, Barer DH; 1993; Predicting the outcome of stroke: Are general impressions sufficient?; Clinical Rehabilitation; 8: 259-260, (presented to the Society for Research in Rehabilitation).

Chapter 1

Introduction

Stroke is the third major cause of death (after cancer and ischaemic heart disease) and a major cause of disability, but there has been an apparent disinterest in stroke illness (and other chronically disabling conditions) by health and social services staff as well as by clinicians. Only relatively recently the government has come to recognise that stroke care is an important issue as stroke contributes at least 6 % to the health bill and to the loss of approximately 7.7 million working days each year (Secretary of State for Health, 1992).

Reduction in stroke related mortality has been included in the Health of the Nation objectives as follows:

> *"A. To reduce death rates for....stroke in people under 65 by at least 40% by the year 2000 (from...12.5 per 100,000 population in 1990 to no more than 7.5 per 100,000 for stroke).....*
>
> *C. To reduce the death rate for stroke in people aged 65 to 74 by at least 40% by the year 2000 (from 265 per 100,000 population in 1990 to no more than 159 per 100,000)."*
>
> (Secretary of State for Health, 1992)

It is perhaps a contradiction that these Health of the Nation targets are aimed at a reduction in stroke related death and do not include those targets related to social, emotional and psychological aspects and quality of life, which arguably cause the greatest individual distress and societal financial burden.

Further, though it is a commonly held view that stroke should be treated as a medical emergency, less than 20% of people who suffer an acute stroke are admitted to hospital within the first three hours of the event (unpublished data from an audit of Liverpool hospitals). This delay in access to specialist treatment may contribute to the risk of early deterioration and death, with the survivors having increased functional dependence and less successful outcome in the long term.

In practice, hospital staff endeavour to ensure that as many people as possible achieve functional independence. However, the funding for therapy services provision is limited and results in staff being obliged to target interventions at those patients they feel are most likely to benefit. As with any "rationing" ethos the requirement is to minimise costs and maximise effectiveness. Outcome tends to be measured in terms of levels of functional independence. Consequently, psychological interventions and the measurement of psychological outcomes are ignored.

Little information is available to guide staff as to how to address psychological issues and there is a dearth of literature on the cost-effectiveness of therapy with regards to severity of stroke. Consequently, staff have to make the choice of how much therapy to give and to which patients, based on their own "experience". This is wholly unacceptable in the modern NHS where the emphasis is on evidence based practice.

Anecdotally, staff often feel that they know intuitively who will do well or badly in stroke rehabilitation, though they often cannot explain the exact reasoning behind their ideas and little research has addressed this issue. Nevertheless, one of the main assumptions underlying current policy requiring therapists to target rehabilitation effort is that therapists can accurately identify which patients are likely to have the potential to do well (and hence justify rehabilitation effort) and those who are likely to deteriorate and/or die (making rehabilitation effort not cost-effective).

Few studies have examined empirically whether therapy staff can indeed predict rehabilitation outcome reliably. This would seem to be a crucial issue given that it is at present central to the allocation of rehabilitation resources and directly impacts on patient care. It was this issue that provided the impetus to undertake the research presented here.

Further, as it was already established that mood and other psychological factors influence patients recovery following stroke (e.g. House et al., 1989; Starkstein and Robinson, 1989), it is not unreasonable to consider that patients (and possibly carers too) may have expectations of recovery which may also affect outcome.

Consequently, the initial intention of the main study for this thesis was to examine therapists, patients and carers predictions and expectations of recovery following stroke and how these differing ideas interact to determine rehabilitation outcome.

However, the thesis restricts itself to consideration of the preliminary work relating to the identification of therapist's predictions and patient's expectations of outcome. Later in the thesis, patients expectations were identified in a structured way and were then compared, in the context of demographic (age and sex), situational (features and severity of stroke) and some individual difference/person variables (functional and emotional consequences of the stroke), to survival and functional and emotional outcome.

Consequently, a series of preliminary studies led up to the main study for the thesis.

Study 1, detailed in Chapter 3, examines the reliability and accuracy of prediction using two methods of classification of current and future functioning: one based on the Barthel Activities of Daily Living Index and the other, a more Global prediction based on; "better", "same" or "worse" administered at the same time point (at 1 week and 3 months). The questions to be asked were:

1) What are the base rate statistics for patients getting better, getting worse or staying the same?

2) Considering these figures, how well and in what direction do therapists predict rehabilitation outcome?

The emphasis in this part of the work was on functional independence as it is an important part of rehabilitation. The next part of the work undertaken addresses psychological variables.

Stroke is a neuropsychological condition for which rehabilitation is needed: the patient is not a passive recipient of rehabilitation but has his/her own ideas and expectations. The culture in which he or she lives supplies informal information about stroke. Lay theories of stroke and health beliefs form the cultural backcloth to the individual patient's beliefs about what will happen after a stroke and what might help. The possibility that rehabilitation progress may be helped or hindered by patients' ideas about the stroke and whether patients ideas differ radically from those of the staff has rarely been considered.

Chapter 4 details a theoretical model that was developed by the author, based on current thinking, which has utility as a potential framework for understanding the possible inter-relationships of the different ideas and attitudes patients' relating to how explanations of health and illness interact with;

i) the stroke event

ii) other people's reaction to the stroke

iii) subsequent progress by the patient

to determine the patient's rehabilitation outcome. This model was used to guide the literature review presented in Chapter 2. This review examines

a) lay theories and health beliefs

b) psychological factors in rehabilitation, i.e. attribution, self-regard, locus of control, coping, health optimism and motivation.

Chapters 5 and 6 report the work undertaken preliminary to the main study and are concerned with the development of a reliable and valid questionnaire to examine the hypotheses of the main study. Chapter 5 reports a qualitative study which gathered stroke patients' ideas in detail about what will help them get better and what will happen in the future. In this qualitative study, statements identified as reflecting the patients' ideas were then classified into themes and sub-themes to form the conceptual framework for the questionnaire described in Chapter 6. Chapter 6 describes the psychometric properties of the questionnaire which was developed to assess what patients think will help and what they think will happen in the course of their stroke rehabilitation.

Chapter 7 concerns methodology and introduces the aims and objectives of the main study which is the subject of this thesis. It includes a description of the instruments used which reflect

i) demographics (age and sex),

ii) features of (weakness, inattention) and severity of stroke

iii) functional ability and emotional consequences

iv) expectations of recovery in terms of what will Help and what will Happen

Chapters 8-10 present the results. Chapter 8 describes the patient characteristics of the sample used. Chapter 9 looks at the relationship between these patient characteristics and outcome variables such as

a) length of stay in hospital

b) discharge destination

c) status at 3 months (survival, residence, depression and expectation variables and disability and handicap measures)

Chapter 10 examines the relationship of expectations with status at 3 months

i) in a series of bivariate comparisons (e.g. the relationship between expectations at week 2 and mood at 3 months)

ii) in multivariate comparisons of expectations with other factors identified early after stroke as compared to multiple level outcome variables (e.g. multiple regression models of factors possibly predicting functional or emotional outcome)

iii) in multivariate comparisons of expectations with other factors identified early after stroke as compared to dichotomous outcomes (e.g. logistic regression models of factors possibly predicting "good" or "bad" outcome in terms of "survival and/or functional or emotional independence" versus "death and/or functional or emotional dependency")

To conclude the thesis there are 2 chapters concerned with setting the results in context. Chapter 11 concerns itself with summarising the findings, discussing the methods used and identifying their limitations, relating the findings to the literature on psychological adjustment in chronic illness and stroke rehabilitation.

The final chapter sets the thesis in the context of a larger piece of research. The thesis restricts itself to the consideration of patients' expectations. Data were also collected from the patient's carers on carer expectations about rehabilitation and there was further data collected on therapist expectations. Carer and therapists expectations are not reported here in the interests of clarity.

The research study was also performed in parallel to a discharge planning audit study which examined communication across the hospital-community interface and health and social services input post-discharge. This cohort of patients have been followed up at 12, 24 and 36 months post-stroke and further data will be available in 1999.

In summary, this chapter has endeavoured to explain to the reader the rationale for the series of studies and to show how earlier projects have eventually led to the main study. A conceptual framework, detailing each logical step, has been provided to guide the reader through the thesis, allowing them to slot each part of the "story" into a meaningful whole. The thesis has been set in the context of both; stroke services and care, and within the framework of other research projects. It has been pointed out that the main study was part of a larger piece of research not just looking at patients' expectations, but also looking at the expectations of significant others (carers and therapists). The following chapters will be more detailed, though in the interests of clarity the contents of each chapter will be to some extent limited. The thesis will continue to endeavour to explain the limitations of each chapter as the thesis progresses. The thesis will start by reporting a review of the medical and psychological literature pertaining to stroke.

Chapter 2

Stroke: A review of the medical and psychological literature

The previous chapter aimed to summarise the thesis, explaining the initial impetus for addressing this particular research topic, the rationale for each of a series of studies and how each contributed to the design and contents of the main study. This chapter will now review the literature on stroke to explain

a) what a stroke is; in medical terms, with reference to the extent of the problem both in the UK and in the world as a whole

b) the manifestations of stroke in terms of neuropsychological deficits (specific impairments due to the stroke) and psychological reactions (general feelings of the patient which could be seen as secondary to the stroke)

c) the way in which these deficits and emotional reactions interact to determine recovery and rehabilitation, which will subsequently govern quality of life and future prognosis.

It is beyond the scope of this thesis to describe in detail every possible deficit caused by a stroke and every study performed to determine incidence, prevalence and time course for recovery. This chapter is aimed at providing a broad overview of, and the range of problems associated with stroke, to allow some appreciation of the complexity of problems and the debilitating effects of this disorder. Therefore, a summary of the available literature will be provided. The main categories of problems will be highlighted (cognitive, perceptual, visuospatial etc.) and a rough timescale for recovery of the different types of deficits will also be included. Research studies using stroke patients tend to have similar methodological problems (particularly pertaining to sampling and selection bias) which to some extent are unavoidable (e.g. not being able to include patients who have receptive and expressive problems). Therefore, the thesis will restrict itself to highlighting problems as they arise in order to point out issues to be addressed in the design of the series of research studies which led to this thesis but will not exhaustively detail every problem with every study mentioned in the literature review. To do so would only detract from the main aim of this chapter which is to give the reader an understanding of some of the possible problems a stroke sufferer may face. It hopes to show emphatically why it is not sufficient for health and social services to address exclusively problems relating to impairments, disabilities and handicap while disregarding the psychosocial aspects of stroke illness. We will now turn to an explanation of the underlying mechanism that produces neurological deficits "at a stroke".

2.1 What is a Stroke?

A stroke is a "*...rapidly developed clinical sign of focal (or global) disturbance of cerebral function, lasting more than 24 hours or leading to death, with no apparent cause other than of vascular origin.*" (Aho, 1980).

The most common cause of strokes is where an artery is occluded either by a thrombus or an embolus. These are termed ischaemic strokes and comprise 85% of strokes (Bamford et al., 1990). The blockage causes part of the brain which is supplied by that artery to be deprived of blood (and thus oxygen, glucose etc.) and brain function is impaired. If the blockage lasts for more than 5 minutes permanent damage occurs. If that part of the brain has an alternative blood supply then the effects may be attenuated.

However, where major vessels are occluded and there is no alternative supply, damage to the brain can be severe and irreversible.

The symptoms and signs of the stroke will be dependant upon the area of the brain affected. Ricci et al. (1991) and Bamford et al. (1990) have described a clinical classification of stroke subtype and their incidence (see Table 1). When the circulation to some parts of the brain is interrupted (e.g. parietal lobe) some strokes may cause changes in cognition, personality, mood and emotional lability.

Table 1. Oxford Community Stroke Project Classification (Bamford et al., 1990)

STROKE SUBTYPE	DEFICIT	INCIDENCE
Total Anterior Circulatory Syndromes (TACS)	hemiplegia or hemiparesis (involving the face, arm and leg) with disorders of higher cerebral function (visuospatial disorders and/or dysphasia),	15%
Partial Anterior Circulatory Syndromes (PACS)	higher cerebral dysfunction and two of the above (face, arm or leg),	56%
Posterior Circulatory Syndromes (POCS)	cerebellar (ataxia) or brain stem (unconsciousness) signs	8%
Lacunar Syndromes (LACS)	isolated problems pure motor/sensory loss or those of the ophthalmic artery (a branch of the internal carotid) can cause blindness in one eye.	20%
unclassifiable or the origin is unknown		11%

The other less common (10%) cause of strokes is primary intracerebral haemorrhage (PICH), where a vessel ruptures and bleeds into the brain. Again, the area of the brain where the haemorrhage occurs reflects the type and severity of dysfunction and impairment. The most common causes of PICH are malformation of a vessel or hypertension. Raised intracranial pressure and cerebral oedema (with or without mass effect, i.e. oedema causing the brain to be distorted within the skull) cause further damage to the brain tissue.

Sub arachnoid haemorrhages (with a different aetiology and prognosis) form the remaining 5% of strokes.

To understand the traumatic impact of stroke on brain function it is useful to look at the analogy of the brain as a factory. For example, in the "normal" working brain, Bernard Isaacs (1992) has suggested;

> "*The brain may be likened to a factory which operates at 3 levels ....*"
> the function of each is defined:-

operative (shop floor)	→	ability to perform a defined motor/sensory task
administrative (board room)	→	control of planning and execution of a programme of movement (e.g. put on shirt)
communicative (post room)	→	transfer of information and instructions from one part of the brain to the other

He said that a

> "*stroke is like a bomb, causing damage at the site of the "explosion" and disrupting communication with undamaged parts. Loss of neuronal tissue ...resembles bomb damage to the factory. When the shop floor is damaged, production in that part of the factory ceases until repairs can be made and new staff brought in. When offices are damaged, production may continue for a while, but it is unplanned and unsupervised, and products may be defective.... When the post room is damaged, one part of the organisation does not know what the other parts are doing.*
>
> "*So in stroke...the brain as a whole carries on until the damage is repaired or compensated for. When administrative functions are lost,*

movement and sensation may still be present, but they do not combine to allow function to be performed. Loss of communication leads to "disconnection" and autonomous behaviour by different parts of the brain, which may appear illogical or inconsistent".

This analogy (developed by a geriatrician) gives a tangible and plausible description of the physical effects of stroke, but fails to include the devastation caused to the patient and their relatives. The psychosocial and emotional aspects of stroke which completely change the sufferers' lifestyle (even in the absence of continuing obvious impairment) should not be ignored.

2.2 Epidemiology

The incidence of new strokes in the UK is high, with approximately 100,000 first strokes each year. That is, approximately 2.4 per 1000 per year new strokes, with the prevalence being around 6 per 1000 per year (Wade, 1992). Stroke accounts for around 80,000 deaths every year. Overall these incidence rates are similar to those described in Europe and the rest of the world (Thorvaldsen et al., 1995; D'Alesandro et al., 1992; Bamford et al., 1988; Malmgren et al., 1987) although there are some geographical areas where incidence is much higher (e.g. China). If one includes all new strokes, that is both first and recurrent, the incidence has been described as 20% - 30%, higher (Bonita et al., 1984).

The incidence of stroke increases with advancing age, with around 80% of strokes occurring in those over the age of 65 years. Approximately 11 million people are over the age of 65, that is about 20% of the total population. As the incidence of stroke increases with age and the proportion of elderly people is increasing, it has been estimated that by the year 2023, the numbers of new strokes per year will have increased by 30% since 1983 (Malmgren et al., 1989).

Bonita (1992) has suggested that, although men are more likely to have a stroke than women, women are more likely to die from their stroke. It is suggested that this may be due to greater age at onset or perhaps merely due to the fact that women live longer. It would seem that the most important prognosticators for survival are those characteristics of an individual that are not amenable or in fact possible to change (age, initial level of consciousness following stroke, incontinence in the first 24 hours post-stroke) (Wolfe et al., 1993).

About a third of those who suffer a stroke will die in the first month, a third will recover with virtually no residual problems, but the remaining survivors will have moderate to severe disability requiring help from others in their day to day lives (Bamford et al., 1990). The risk of recurrent stroke is high in the first week and the risk remains high for the first month. However, as time goes by the risk becomes less and by 12 months post-stroke, survivors are no more likely than any other person with cerebrovascular disease to have a stroke and in the first year post-stroke, more people die of heart attacks than of subsequent strokes (Dennis et al., 1993). It has also been shown that by 5 years post-stroke 55% of patients survive, although older patients are more likely to have died (Dennis et al., 1993).

In Liverpool hospitals around 700 people with strokes are admitted each year to the main teaching hospital, with a further 550 per year being admitted to the District General Hospital. Liverpool hospitals have a catchment area of 750,000. This would indicate that around two thirds are admitted to hospital and the remaining third are treated in the community by their General Practitioner.

However, the total number of strokes that occur is unknown and only estimates are available. Several factors mitigate towards this. The diagnosis of stroke is generally made on clinical grounds with only some centres confirming diagnosis with computerised tomographic scanning (CT Scanning). However, CT scans are performed to exclude or confirm stroke due to primary intracerebral haemorrhage, with ischaemic strokes rarely showing on scans performed in the early stages. Therefore, the diagnosis continues to be based on clinical judgement and classification using the Bamford Classification (Bamford et al., 1990). For non-hospitalised strokes the diagnosis relies on the skills of general practitioners who rarely see strokes in the acute stage; the majority only seeing 4 or 5 new cases each year (Watkins et al., 1996).

Whether in hospital or in the community, few accurate statistics are collected and figures for all parts of this and other countries rely on estimates based mainly on standardised mortality ratios and the extrapolation of some locally collected data (Bamford et al., 1988). However, this data is all that is available.

The burden of stroke on the community is compounded by the problems of

a) diffuse cerebrovascular disease leading to overall brain ischaemia

b) multi-infarct disease as a result of several areas of infarct brain tissue

Both interfere with brain functioning and will manifest themselves as cognitive or behavioural problems. These problems are known to have a detrimental effect on the outcome of rehabilitation (Galski et al., 1993; Carter et al., 1988; Bernspang et al., 1987; Adams and Hurwitz, 1963).

2.3 Stroke as a Neuropsychological Event

Brain damage, whether due to ischaemia or infarction can cause impairment in brain function and consequently results in neuropsychological problems. There is no general agreement on what abilities should be classed as neuropsychological problems (Ebrahim, 1990). It has been suggested by Isaacs (1992) that the neuropsychological sequelae of the physical damage caused to the brain by stroke can be viewed as

i) "operative" impairments of movement, sensation and vision, e.g. hemiplegia, hemianaesthesia, hemianopia)
ii) "administrative" impairments of e.g. apraxia, agnosia
iii) problems of "disconnection" e.g. where the transfer of information between the left and right hemispheres is interrupted

Though it is acknowledged that it is difficult to clearly divide these problems and much overlap exists. For example, perception relies upon detection of the stimulus, followed by recognition, where recognition may be dependent upon long term memory.

For the purpose of this thesis we will examine the neuropsychological problems of

i) memory, orientation, abstract thinking, concentration and orientation which we will refer to as "cognition" (although it is acknowledged that ii) and iii) are also cognitive functions)
ii) visual field and visual space deficits, agnosia, visual agnosia which we will term "perceptual and visuospatial abilities"

iii) the production and comprehension of speech and gesture which we will term "communication"

2.31 Effect on Cognition

Improvements in cognitive performance (defined here as memory and orientation, abstract thinking, and attention and concentration) are beneficial not merely for improvements in functional capabilities, but for successful rehabilitation (Prescott et al., 1982) and for reintegration into the community (Neistadt, 1987; Panikoff, 1983).

Cognitive impairment correlates strongly with more severe stroke (Hachinski et al., 1985). Ebrahim et al. (1985) identified cognitive problems in 12% of those surviving to 6 months while Wade et al. (1986b) identified 29% with memory problems on story and picture tasks.

Paolucci et al. (1996) demonstrated how crucial cognitive factors are in terms of outcome. They showed that cognitive impairment was a significant independent predictor of poor outcome, even after adjusting for age and severity of stroke. David and Skilbeck (1984) when examining general cognitive function in dysphasic strokes, found that most people's intellectual functioning improved as time went by after the stroke, but those with greater intellectual impairment were more likely to have died by 6 months.

Sunderland et al. (1996) and Stewart et al. (1996) examined memory disorder more than 12 months after stroke, not only to look at prevalence of problems but to determine whether spontaneous improvements in functioning were due to patients adaptation to the problem or to actual improvement in cognitive deficits. They found that on simulations of everyday tasks, 50% of patients displayed deficits in performance. Nevertheless, despite poor performance under test conditions they found few cognitive failures in everyday life.

Some cognitive deficits have been found to be associated with specific and localised brain damage. For example, right hemisphere parieto-occipital lesions have been found to have associations with disorientation for place (Fisher, 1982) and left hemisphere parieto-occipital lesions frequently have problems with recall (Ebrahim, 1985).

Though many stroke patients are aware of their cognitive problems and may complain of memory impairment (Tinson and Lincoln, 1987), some do not have insight into the extent of their problems and may not report having difficulties. A variety of tests to detect different aspects of cognitive and perceptual problems needs to be performed in order to reveal all deficits present.

Various methods have been tried in order to compensate for memory including mechanical or environmental reminders (calendars, diaries, computers, body worn alarms). Other strategies have included the use of routines and cognitive prompts (Wade et al., 1985).

Before aids can be used and lifestyles adjusted it is necessary to identify specific problems for particular individuals.

2.32 Effect on Perceptual and Visuospatial Abilities

Those people with strokes resulting in either right or left hemiplegias may have perceptual problems (Edmans and Lincoln, 1987). Those with strokes with right hemisphere lesions are also more likely to have visual neglect and spatial disorientation and consequently have poorer outcomes (Meerwaldt, 1983). These problems are important as they add a further challenge to and interfere with rehabilitation (Edmans and Lincoln, 1990; Andrews et al., 1980).

These findings were supported by the work of Gupta et al. (1997) who demonstrated that 32% of those admitted to hospital with a stroke had some visuospatial dysfunction, and established that at discharge even though they had made similar amounts of motor recovery to those without visuospatial problems, they were significantly more dependent (i.e. they had lower Barthel scores than those without visuospatial problems). They studied the effects of early functional rehabilitation in those with visuospatial problems. Although patients were shown to improve generally, dependency at discharge was not significantly reduced even though it seemed that they had a significantly reduced length of stay (Gupta et al., 1997).

Edmans and Lincoln (1991) used a series of single case studies to evaluate the effectiveness of treatments in right hemiplegic patients but could not demonstrate any improvements in perceptual deficits. It was suggested that the effectiveness of the intervention in the Gupta et al. (1997) study could have been the results of the extra stimulation given to these patients whilst participating in such a study. Similar stimulation could be provided to all patients by relatives and friends on a daily basis (Edmans and Lincoln, 1991).

In order to address these problems they must first be identified. Those patients with hemiplegic strokes are generally assessed for visuospatial problems, whilst those with apparently complete spontaneous neurological recovery may be less likely to be assessed and thus to have problems identified (Marshall et al., 1997).

The performance on visual attentional tasks of subjects who had complete spontaneous neurological recovery after a single lateralised cortical ischaemic stroke were compared with that of control subjects (Marshall et al., 1997). They wished to determine if there was evidence of hemi-inattention on gross clinical testing or on the traditional letter-cancellation tasks in those who had suffered a stroke. There was no evidence of higher rates of hemi-inattention, but those with the stroke had significantly impaired attention compared to controls.

Visual field problems are also associated with increased mortality and poor functional recovery (Wade et al., 1985). Tactile perceptual deficits also pose problems for participation in rehabilitation. It has been suggested that 46% of right hemisphere lesions have hemianopia (Hier et al., 1983; Kertesz and Dobrowolski, 1981), though other studies have found only 33% (Willanger et al., 1981).

These problems frequently do not occur in isolation with approximately three quarters of patients with hemianopia also having visual neglect (Willanger et al., 1981). Despite the identification of large numbers of patients with these problems at an early stage post-stroke, it has been suggested that up to 50% of these problems have resolved before 32 weeks post-stroke (Hier et al., 1983).

However, the results of studies examining the prevalence of visuospatial problems after stroke provide incomplete data as many patients are excluded reducing the possibility of generalising from results obtained. Patients who have had a previous stroke, who are unable to write, have language problems or severe cognitive impairment are amongst those who are commonly excluded. For example, Friedman (1991,1992) examined performance on Clock Drawing and the Star Cancellation Test. In both studies patients were only included if they were:

> *"first ever strokes free of cognitive impairment and able to write".*

In the former study, they also went on to exclude other patients as well

i) those 60 years of age or younger

ii) those who had survived for at least 30 days post-stroke

iii) those with moderate to severe dependency or dementia prior to the stroke .

The patients who were eventually included were unlikely to be representative of stroke patients as a whole. They did not mention the issue of study consent, but it can only be presumed that either verbal or written consent was necessary which would have reduced numbers further. To some extent these problems are unavoidable but it is important to be aware of the limitations of the data available.

Paolucci et al. (1996), in a prospective study of 273 consecutive stroke patients admitted to a rehabilitation unit found that severity of stroke at admission and hemineglect were the strongest prognostic factors. Those with hemineglect had a significantly higher relative risk of poor autonomy and impaired mobility.

Early neuropsychological screening is therefore suggested to be essential.

2.33 Effect on Communication

Communication is a very important part of all our lives (both verbal, written and other non verbal, e.g. facial expression). Being unable to communicate effectively can cause practical social problems and can also contribute immensely to psychological distress in both the stroke sufferer and their friends and relatives (Brumfitt, 1993;

Herrmann and Wallesch, 1989). Severe depression can result from an inability to communicate, though the extent of psychological problems in these patients is unclear as screening tools generally rely on communication (Starkstein and Robinson, 1988). It has been suggested that speech therapy is important if only to assess problems, advise patients and relatives and co-ordinate attendance at support groups (Wade and Hewer, 1985).

Following a stroke, some people have aphasia which means they are unable to comprehend or produce language. Some may have dysphasia, which is a difficulty in retrieving the correct words from memory, others may have dysarthria and dyspraxia, where they can understand and produce the correct words but have trouble articulating them (Enderby et al., 1987a). There may also be additional problems with deficits in non-verbal communication, e.g. gesture or facial expression, which should also be taken into account (Blomert, 1990). Over a third (Bonita and Anderson, 1983) of hospitalised stroke survivors have speech problems. In the first week post-stroke approximately 25% have dysphasia (Wade et al., 1986a), few make little recovery by 6 months (Lendrem and Lincoln, 1985) and 12% continue to have speech problems at 6 months (Wade et al., 1986a).

Most recovery is made in patients with moderate speech problems, less recovery is evident in patients with severe problems and the least recovery is made in patients with mild problems (Shewan and Kertesz, 1984). It would seem that any recovery occurs spontaneously and that the majority is within the first year.

It seems reasonable to assume that social support, stimulation, mood and motivation may influence recovery in these patients, although few studies exist to support these comments. Studies that have examined speech therapy treatments have failed to show any significant improvements in language abilities (Lincoln et al., 1984; David et al., 1982) although methodological problems may have obscured results. Sample sizes have been relatively small, subjects heterogeneous and those who recovered early were excluded from the analyses (Lincoln et al., 1984; David et al., 1982).

There is a dearth of studies examining the ability of therapies to encourage effective use of non-verbal communication. However, it is only recently that an assessment of such communications (gestures, pointing etc.) has been developed (Cunningham et al., 1995). This is called the Assessment of Communicative Effectiveness in Severe Aphasia (ACESA) and it is aimed at detecting change during speech therapy.

2.34 Effects on Activities of Daily Living

The following section describes the effects of common impairments associated with stroke on activities of daily living. Whilst the most obvious impairment caused by the majority of strokes is hemiparesis or hemiplegia, incontinence will also be considered in more detail here as it has been shown to be, a potent single predictor of functional recovery after stroke. It is important to recognise which activities of daily living may initially be affected by a stroke and the time course of recovery (if any) in order to determine which (either singly or together with others) may give an early indication of future outcome. These activities of daily living may be integral to the development of models to allow the prediction of outcome following stroke, which will be a significant theme later in the thesis.

2.34(1) Movement

Hemiparesis, a weakness affecting one side of the body or hemiplegia, paralysis affecting one side of the body, may result from the stroke and may affect the right or left side of the body depending upon the site of the lesion. These (together with reduced muscle tone and loss of tendon reflexes) result in patients often being unable to sit up straight, stand up or walk. Muscle power must return before function can improve. Some patients may have weakness in their arm, leg, both or neither. Weakness in the arm and the leg usually improves at a similar rate, however, it has been found that leg power returns about a week ahead of arm function (Fugl-Meyer et al., 1975).

Newman (1972) suggested that, in terms of motor recovery, 80% of patients ultimate level of recovery has occurred by 6 weeks post-stroke and that little further improvement was made after 14 weeks. Skilbeck et al. (1983) and other authors (Partridge and Johnson, 1989; Andrews et al., 1981) have shown that spontaneous recovery occurs mostly in the first 3 months post-stroke, with some improvement still evident up to 6 months, but little recovery occurs after that. Nevertheless, 40% of those who can not walk at 6 months post stroke have achieved independent walking (with or without the use of aids) by 12 months. Furthermore, it has been reported that 85% of patients could walk independently at 12 months (Wade and Hewer, 1987). Therefore, it would seem that although the most obvious day by day improvements are seen early post-stroke, overall function may improve. This may be related to spontaneous recovery, but may also be due to people finding new ways to perform some tasks either by themselves or through therapeutic input. Skilbeck et al (1985) and others (Partridge et al, 1989; Wade & Hewer, 1987 & Andrews et al, 1981) followed up acute stroke patients who had a first ever stroke and it is impossible to generalise these data to a large proportion of stroke sufferers, of whom nearly a third have suffered a previous stroke (Watkins et al., 1996).

Arm function has an even more profound effect on the performance of daily activities and recovery is not usually as successful as that in the leg. Seventy five percent of patients are reported to have deficits in arm function in the early stages (Wade et al., 1983) and by 6 months, 39% still are without arm function. Again, most recovery is reported as occurring in the first 3 months after the stroke.

The number of patients reported as being independent at 12 months post-stroke varies from 38% to 83% (Bernspang, 1987; Stevens et al., 1984; Kotila et al., 1984; Skilbeck et al., 1983; Andrews et al., 1981; Aho et al., 1980). However, sampling varies as some studies are hospital and others community based.

2.34(2) Incontinence

It has been suggested that incontinence after stroke is generally caused by; disruption of neuromicturition pathways, stroke-related cognitive and language deficits, and concurrent neuropathy or medication use (Gelber et al., 1993). However, there are many different causes and manifestations of incontinence (Sakakibara et al., 1996; Borrie et al., 1986; Tsuchida et al., 1983) including loss of cortical inhibition, overflow, reflex and stress.

Several studies have been performed to determine incidence and prevalence of incontinence after stroke (Barer, 1989; Borrie et al., 1986; Lipsey et al., 1984). For example, Barer (1989) found that more than 50% of stroke patients were incontinent of urine on admission to hospital and 29% were still incontinent at a month post-stroke.

Borrie et al. (1986), found that at 1, 4 and 12 weeks, 60, 42 and 29% of patients (respectively) were suffering from incontinence, with detrusor instability being the main cause in those who were continent before their stroke. The reflex contraction of the detrusor muscle surrounding the bladder forces urine out of the bladder and out through the urethra. Those with more severe deficits were more likely to be incontinent at week 4 and this was compounded by impaired mobility and mental impairment. Lipsey et al. (1984) had also found an association of incontinence with dysphasia and suggested that the inability to communicate "the need to go" was the major cause rather than the cortical position or size of infarction. Brocklehurst et al. (1985) and Wade (1992) reported similar numbers to Lipsey and colleagues (1984). That is, Wade's patients were assessed in the acute stage, at week 3 and at 6 months post-stroke and he found that 44%, 24%, and 11% respectively suffered incontinence. Dias and Smithard (1997) performed follow ups at a year post-stroke and found that 32% had urinary incontinence. A community based population study of prevalence of incontinence following stroke found similar numbers with urinary incontinence (Nakayama et al., 1997).

In Borrie's (1986) study, for strokes with mild deficits, 2/3 of those who were incontinent at week 4 had regained continence by week 12. Lipsey et al. (1984) found that 17% suffered from incontinence prior to their stroke. Surprisingly this did not necessarily mean that problems were necessarily untreatable as 7 survivors who had been incontinent prior to their stroke, actually regained continence. Though it should be noted that these 7 survivors had only mild deficits due to their stroke.

Several authors (e.g. Taub et al., 1994; Gladman et al., 1992; Barer, 1989; Wade and Hewer, 1985) have demonstrated the importance of continence as a prognostic indicator and as an important factor socially for patients and their carers. For example, outcome was found to be better in those who were always continent or who became continent (Barer, 1989). Incontinence in the acute stage is an indicator of poor prognosis (Wade and Hewer, 1985) while others have highlighted the value of continence as an early predictor of rehabilitation outcome (Perez et al., 1997).

A common assumption is that incontinence is associated with more severe strokes and hence the more severe sequalae such as hemiplegia. However, Barer (1989) found that the prognostic value of continence was independent of well renowned predictors like hemiplegia and impaired consciousness. He suggested that an important intervening psychological variable may be:

> "*motivation and subjective emotional distress...*" and that rehabilitation "*..should be directed towards the specific goal of re-establishing continence and personal dignity*".

Other treatments have also been suggested, for example, if incontinence results from detrusor instability, tricyclic antidepressant drugs like imipramine may prove beneficial, though side effects need to be carefully monitored (Lipsey et al., 1984).

Brocklehurst et al. (1985) examined the incidence of faecal incontinence and found that 23% had problems within the first 2 weeks and 3% still had problems at 6 months. This has been thought to be even more distressing for both patients and their relatives than urinary incontinence (Nakayama et al., 1997). Nakayama et al. (1997) examined faecal incontinence initially and again at 6 months in their community based study. They found that initially 34% had full, 6% had partial and 60% had no faecal incontinence. By 6 months post-stroke 5% had full, 4% had partial and 91% had no faecal incontinence. That is, 40% have problems initially but this declines to about 10% by 6 months.

Risk factors for urinary incontinence and faecal incontinence were identified (Nakayama et al., 1997) as being; age, severity of stroke, diabetes and other disabling diseases. Hypertension was also identified as a risk factor, though it actually halves the risk of urinary incontinence after stroke. It has been suggested that this may be due to an effect of antihypertensive medication or to its association with other covariates (e.g. diabetes) observed in their logistic regression model (Nakayama et al., 1997).

It has been suggested that continence problems may be worse in those with visual field problems, but Sakakibara et al. (1996) found no such relationship. However, they did find a significant relationship with hemiparesis and also that micturitional problems (irritative and/or obstructive problems, e.g. those leading to nocturnal frequency and urge incontinence) were more common in those with frontal lobe lesions (than those in the occipital lobe) and in those with involvement of the basal ganglia.

With regard to risk factors for faecal incontinence, age and diabetes have an independent negative influence. This may be due to lower anal sphincter pressure with age (Read et al., 1979) and abnormal internal-anal-sphincter function in patients with diabetes (Schiller et al., 1982).

2.4 Psychological effects: Mood and Emotion

Depression, the most common psychiatric disorder in those over the age of 65 (Blazer, 1980), has been estimated as having a prevalence of 15% in the community (Butler et al., 1997; Katona et al., 1995; Copeland et al., 1987) and approximately 33% in hospital (Jackson and Baldwin, 1993; Koenig et al., 1988). They (and others) report that, if depressed, older people tend to present with physical symptoms (insomnia, weight loss/gain, constipation etc.) and are less likely to say that they are feeling depressed or suicidal. They suggest that as generalised anxiety is such a common feature of depression in the elderly, with anxiety disorders being 20 times more likely in depressed than non-depressed elderly, those presenting with such symptoms should be assumed to be depressed (unless some other explanation becomes apparent, e.g. dementia). About 30% of stroke patients are reported to be anxious at 6 months post stroke (Wade et al., 1985).

Although anxiety states and depressive illness are classified in DSM-IV and ICD-10 as separate disorders, symptoms often co-vary leading to mixed conditions, such as agitated depression where subjectively and objectively the patient presents as anxious but where symptoms may be successfully ameliorated by antidepressant medication. However, anxiety can persist when mood has improved (Blazer et al., 1989) and several scales have been developed which successfully distinguish anxiety and depression (Goldberg et al., 1988).

Ill health has been reported as a predisposing factor to depression and worsens the prognosis (Baldwin, 1991). A previous family or personal history of depression, institutionalisation, bereavement or other loss and loneliness have also been recognised as risk factors (Kennedy et al., 1989; Carpiniello et al., 1989; Murphy, 1982). Butler et al. (1997) identified risk factors which included; recent loss (e.g. widowhood or mastectomy), living alone, co-morbidities (e.g., hypertension, stroke, cognitive deficits), and drug interactions.

As these factors are often common features of older age and ageing, and are thought of as understandable reactions to adversity, they are frequently either ignored or health professionals are reluctant to treat the resultant depression.

Depression often not only causes but results from ill health in the elderly (Cooper, 1987) but the problem remains under-diagnosed (Livingston and Hinchliffe, 1993; Goldberg, 1985). A community based study comparing the functioning and well being of patients with depression and those with chronic medical conditions (arthritis, hypertension, diabetes and chronic respiratory disorders), showed that depression had a greater impact on function than most disorders and more net cost to the economy (Wells et al., 1989). Furthermore, the effects of depression on top of a chronic condition were additive with respect to reduced functioning and well being.

Not only does depression result from ill health, but it exacerbates the effects of ill health by impeding functional recovery (Silverstone, 1990; Fiebel and Springer, 1982). For those with stroke, should they suffer from depression in the early stages, at the time when their potential for recovery is highest, then this could have major implications on improvement.

The possibility that some patients may be differentially affected by depression and a subsequent reduction in recovery rate must be considered. For example, the prevalence of depression in women has been shown to be higher than in men (Brown and Harris, 1978) and this tendency continues into later life. This has been demonstrated in a Liverpool based study which showed that 13.5% of women as compared to 6.6% of men were depressed (Copeland et al., 1987). The implications for the different sexes following stroke needs to be investigated. Depression in the elderly is associated with increased mortality (Koenig et al., 1988) which is particularly marked in men (Davidson et al., 1988). Thus, when depression does occur in men, the consequences may be severe.

Depression after stroke has been regarded as an understandable psychological reaction to a serious defect in physical or cognitive functions and is quite common, though estimates of incidence rates vary greatly from 18-61% (Johnson, 1991; House et al., 1987; Robinson et al., 1984a; Robinson and Price, 1982). Experiments designed to investigate the problems of depression after stroke are plagued by methodological problems (e.g. small samples, selection bias, validity of measures in this patient group) and this has resulted in these problems being virtually ignored (House et al., 1991). Further, controversy surrounding the cause of post-stroke depression (organic damage versus reactive, e.g. Johnson, 1991) has reduced attention to this problem.

The relationship between physical disability and depression is complicated and though some studies have shown no relationship between severity of stroke and depressive illness (Dam et al., 1989; Sinyor et al., 1986a) others have shown some correlation (Ebrahim et al., 1987). It has therefore been suggested that physical disability may perpetuate depression or, on the other hand, depression may inhibit functional recovery (Starkstein and Robinson, 1989) and interfere with rehabilitation (Adams and Hurwitz, 1963). However, it has been suggested that the relationship between depression and recovery is less clear cut in those with severe strokes (Ebrahim et al., 1987).

Nevertheless, attempts at early recognition of depression are essential (regardless of the cause or other identification problems) as mood disorders may add to the handicap caused by the physical effects of stroke. Depression and anxiety can interfere with participation in the rehabilitation process (Sinyor et al., 1986b; Robinson et al., 1984a). Many people continue to be depressed 6 months after their stroke (Ebrahim et al., 1987).

Studies have attempted to relate the presence of depression after stroke with the side of lesion, though results are conflicting. For example, Robinson et al. (1984b) suggested that those with left hemisphere lesions on CT scan were more likely to be depressed. However, Ebrahim (1990) disagreed with their interpretation of their findings, pointing out that the results seemed skewed by two patients that were particularly severely depressed. Nevertheless, Morris et al. (1996) also found that stroke lesions involving left hemisphere prefrontal or basal ganglia structures were associated with post-stroke depression. That is, they showed more depressive symptoms than other left hemisphere lesions or those with right hemisphere lesions.

Sinyor et al. (1986a) used the methodology of the Robinson study, but could not substantiate previous findings and a later study by Ebrahim et al. (1987) failed to demonstrate a link between side of lesion and the presence or absence of depression. Ebrahim (1990) suggests that previous positive findings were probably “a spurious result caused by selection bias”.

It is likely that depression after stroke is multifactorial (social, emotional and physiological) in origin and different factors may contribute disproportionately to others in the development of depression in individuals. Further research is required to elucidate what factors cause depression and in whom (Shamoian, 1985).

House et al. (1991) identified a range of emotional symptoms following stroke (anxiety, social withdrawal, apathy, self neglect, irritability and emotional lability). House (1989a) demonstrated that 1 in 5 patients suffered from “emotionalism” at 6 months post-stroke and that this was generally accompanied by depressive symptoms. At 12 months, most peoples' mood changed and emotional symptoms had abated, though 1 in 10 continued to have problems. However, Wade et al. (1985) have reported that it is common, clinically, for patients and their relatives to report increased irritability, pessimistic thoughts and feeling miserable in the first year after a stroke. Though these problems may be dimensions of depression, they could also be separate from it and further research is necessary to elucidate these issues.

Nevertheless, even if these emotional problems are only temporary (in the first few months following a stroke) they must be addressed to ensure that patients recover to their;

> *"...optimum level of functioning.. and to live as full a life as possible in their normal environment."*

(International Classification of Impairments, Disabilities and Handicaps, World Health Organisation, 1989).

Depression in the early stages following a stroke has been linked to increased long term mortality rates (Morris et al., 1993a & 1993b). In fact, mortality rates are increased by 3-7 times in stroke patients with depression (Morris et al., 1993a; Morris et al., 1990).

Not only is recognition of depression poor, but Ebrahim et al. (1987) have demonstrated that few receive treatment for depression after discharge from hospital. This may be due to the lack of evidence regarding the effectiveness of anti-depressants in this group (Ebrahim, 1990). Though anti-depressants have proven efficacy, they may not be "effective" because of patient non-compliance. This has been a major problem with drug trials of anti-depressants in this patient group.

Reding et al. (1986) performed a randomised trial on acute strokes (25 patients on trazadone hydrochloride, 22 on placebo). They demonstrated a significant improvement in Barthel Index scores over the four week treatment period in the treated group. However, this was only in 7 of the 25 patients (diagnosed as depressed according to a dexamethasone suppression test). Although this was a population based study (not just "cases") using consecutive patients, 89% were reported to be depressed which would suggest some selection bias. A significant number (25% of the treated group) dropped out of the study due to side effects. Consequently, this does not make a significant contribution to our knowledge about anti-depressant use in stroke.

In another study, 39 patients were recruited, however, there was quite a high (33%) drop out rate in the treated group (Lipsey et al., 1984). The two treatment groups consisted of 22 patients on placebo and only 17 on the tricyclic anti-depressant (nortriptyline). Patients in the treated group showed significant improvements in mood, however, this may have been due to the self selection bias in those remaining, that is, those who remained had only mild to moderate problems in the first place. Ebrahim (1990) points out that Agerholm (1984) felt that the "only thing shown with any certainty...was that nortriptyline is a toxic drug to give to patients after a stroke!"

There is a dearth of studies on psychological interventions in the early stages of acute stroke, so the possible preventive effects of a non-drug treatment for mood and emotional disorders has not been evaluated.

2.41 Screening for Depression

Definitions of depression vary and cover a broad range of situations from feeling helpless, sad and hopeless, to major depressive episodes where someone may be suicidal. Whether these are in fact entirely different or are merely on a continuum has been discussed previously (Cooke, 1980). Snaith (1993) stated that depression;

> "*is used to indicate quite different concepts...for some, clinical depression is an extension of grief, for some it is a set of self-defeating attitudes, for others it is an inevitable result of adversity, while the medically orientated psychiatrist considers it a state based upon malfunctions of neurotransmitter systems in the brain*".

As a result of these dilemmas, the diagnosis of depression is often difficult and there is no specific diagnostic test. A clinical assessment is necessary to positively identify depression, though screening tools may help.

2.41(1) Diagnostic and Statistical Manual of the American Psychological Association Edition IV (DSM-IV).

DSM-IV (American Psychiatric Association, 1994) forms the basis for the clinical diagnosis of depression and the criteria used for the development of many depression scales. Depression in DSM-IV is classed as an "Affective Disorder" with the patient exhibiting depressed or elated mood, and can be subdivided into major depression and dysthymia (a milder form of depression). Major depression and dysthymia are both characterised by low mood, anhedonia (absence of pleasure from usually pleasurable activities), disturbance of appetite and/or sleep. One therefore needs to distinguish between normally depressed mood, dysthymia and major depression. DSM-IV suggests that the person must have depressed mood for most of the day accompanied by anhedonia. These features are to have been present continuously for at least two weeks. Four of these other symptoms are also necessary; significant change in weight (loss or gain), fatigue, sleep disturbance (insomnia or hypersomnia), agitation or retardation, feelings of worthlessness or guilt, concentration difficulties and suicidal ideation. Depression is classed as severe when nearly all of these symptoms are present.

Screening measures of depression can be either clinician rating scales or self-rating methods. However, the formal diagnosis of depression requires a clinical interview with the application of DSM-IV criteria, and the exclusion of other organic causes. Self-rating tools are less time consuming and therefore less costly, however, they are prone to over reporting of somatic symptoms and cannot detect information that would only be ascertained by independent observation of the patient. The medically ill and the elderly frequently genuinely have somatic symptoms in their everyday life and this may contribute to high numbers of false positives (Beck et al., 1988) in these groups. The other problem with self-rated measures is that the patient needs to be capable of completing the scale; both physically and mentally. Again, this can cause problems in the elderly and medically ill, but may also be difficult were there are literacy problems (Hamilton, 1960).

A description and discussion of clinician rating scales and self-reported measures will be included at this point to clarify the rationale for the selection of depression screening tools when performing stroke research in general. It will also clarify why the particular depression screening tools are used in the studies described later in the thesis though explanations will be re-iterated as appropriate.

2.41(2) Clinician Rating Scales

Hamilton Rating Scale for Depression

The Hamilton Rating Scale for Depression (HRSD, Hamilton, 1960) is completed by a clinician to quantify the results of a semi-structured clinical interview to indicate severity once a diagnosis of depressive disorder has been made. It consists of 21 items, leads to a score of 0 to 52 with higher scores indicating more severe depression. The HRSD has been shown to have high inter-rater reliability (IRR) (Montgomery and Asberg, 1979; Hedlund and Vieweg, 1979; Hamilton, 1960), though the IRR for individual items has been shown not to be so good with some items having intraclass coefficients of as low as 0.19 (Maier et al., 1988a; Rehm and O'Hara, 1985).

In terms of symptoms, it includes many behavioural and somatic items, but pays little attention to anhedonia, concentration problems and loss of reactivity to external stimulation (Maier et al., 1988b). Nevertheless, in a review of 19 studies it has been shown to be useful as a measure of change in depression severity (Edwards et al., 1984). However, when compared to the Montgomery Asberg Depression Rating Scale (MADRS, Montgomery and Asberg, 1979) it was felt to correlate less well with clinicians judgements of improvement.

The HRSD cannot be used to diagnose depression, can only be used to determine severity in known cases and cannot therefore be used in population based studies of unselected patients.

Montgomery Asberg Depression Rating Scale

The Montgomery Asberg Depression Rating Scale (Montgomery and Asberg, 1979) was originally developed to measure the severity of depression in those with previously diagnosed depression. It was designed to be particularly sensitive to treatment effects (Davidson et al., 1986; Montgomery and Asberg, 1979) and is completed by a clinician to quantify the results of a semi-structured clinical interview. However, it has now been shown to be more sensitive to change than other clinician rating scales (e.g. Hamilton, Maier and Phillipp, 1985) and proves useful in determining severity of depression (Montgomery and Asberg, 1979).

It consists of 10 items, leads to a score of 0 to 60 with higher scores indicating more severe depression. Though specific cut off points were not indicated by Montgomery and Asberg, Snaith and Taylor (1985) have suggested that; scores of less than 7 indicate no depression, 7-19 mild depression, 20-34 moderate and 35 and above severe depression. The inter-rater reliability has been found to be reasonable, with the authors reporting correlations of between 0.89 and 0.97 (though these studies were performed on small samples of between 12 and 30 patients) and Davidson et al. (1986) reporting 0.76. In terms of construct validity, the MADRS covers the main symptoms of depression (described in the section on DSM-IV), with only motor retardation being omitted (Maier et al., 1988b).

When compared to both the HRSD and Beck Depression Inventory, Kearns et al., 1982) the MADRS compared favourably with the former and performed better in revealing depression than the latter. Furthermore, Maier et al. (1988b) showed that the MADRS correlated more highly with global ratings of depression than global ratings of anxiety. These results were supported by Snaith and Taylor (1985) when they compared the MADRS to the Hospital Anxiety and Depression Scale (HADS, Zigmond and Snaith, 1983) and found that MADRS scores correlated 0.81 with depression and 0.37 with anxiety scores.

The main advantage of the MADRS, particularly in the medically ill and therefore in people who have suffered a stroke, is that it does not include psychomotor symptoms (e.g. retardation), but focuses on the psychic symptoms (e.g. anxiety) of depression (Snaith et al., 1985).

2.41(3) Self rated measures

The Geriatric Depression Scale

The Geriatric Depression Scale (GDS, Brink et al., 1982) originally a 30 item self-reported screening tool was reduced to 15 items (Sheikh and Yesavage, 1986) specifically to detect possible depression in the elderly. It has advantages in the elderly as it does not include somatic symptoms and has been used to good effect by General Practitioners (Brodarty et al., 1993). However, items such as disturbed sleep, lethargy and weight loss are still included which may prove difficult in those with physical illness. When used in stroke patients (Agrell and Dehlin, 1989) it was found to have a high sensitivity (88%) though the specificity was low (64%). Furthermore, the cognitive status of individuals has been shown to severely influence the validity of the GDS. Sensitivity has been reported as being reduced to 25% in the cognitively impaired (Kafonek et al., 1989) particularly in those scoring less than 14 or 15 on the Mini Mental State Examination (MMSE, McGivney et al., 1994). Though the GDS contains more items relevant to the elderly, it does not include persistence of symptoms for two weeks or more as required by DSM criteria (Weiss et al., 1986).

The Beck Depression Inventory

The Beck Depression Inventory (BDI) (Bech, 1981; Beck, 1961) consists of 21 categories which assess various symptoms of depression (15 covering emotions, 4 behavioural changes and 6 somatic symptoms). Symptoms are rated on a 4 item scale and totals range from 0-63 with higher scores indicating more severe depression. The original version was revised in 1978 (Bech, 1981) so that instead of respondents replying to how they are feeling today, they were then asked to refer to the last week (Beck et al., 1988). However, much of the validation has been reported as being on the original version and little work has described the relationship between the two versions (McDowell and Newell, 1996). The BDI also contains several somatic symptom items and may, as with other scales, result in high numbers of false positives in the elderly and medically ill (Williams and Richardson, 1983). Several authors have suggested that the BDI has a high social desirability response bias (Cappeliez, 1989; Langevin and Stancer, 1979) and may reflect this type of response set rather than depression. Also, the fact that the BDI has a 4 item response may lead to difficulties in completion with some patient groups (Kearns et al., 1982) and scales like the GDS where the responses are more simple may be more useful (Norris et al., 1987; Gallagher, 1986) particularly in the elderly.

The General Health Questionnaire

The General Health Questionnaire (GHQ) is a self-rating screening tool for the detection of; depression, anxiety, social impairment and hypochondriasis (Goldberg & Hillier, 1979; Goldberg, 1972). It was not developed to identify psychotic depression though it may actually do so (Goldberg, 1978). It was designed for use; in population studies, by general practitioners and in out patient settings (Goldberg, 1978). Once a patient was identified as a possible case by this tool, it was intended that further verification of the diagnosis would ensue. The emphasis of the responses is on "change from usual". The original version contained 60 items and has the best validity, but shorter versions (12, 20 and 30 items and the 28 item scaled version) have been developed (Goldberg and Hillier, 1979; Goldberg, 1978). The scale has been extensively tested and thoroughly validated (Goldberg, 1978) with only one small study refuting the sensitivity rates reported by Goldberg (Tarnopolsky et al., 1979).

The main criticism is due to the "different from usual" format which fails to take account of those people who have been suffering symptoms for some time (Benjamin et al., 1982). Therefore, it does not screen for chronic conditions but only for acute. An alternative scoring system has been developed by Goodchild and Duncan-Jones (1985) which has gone some way to get over this problem.

The GHQ-60 contains several items that reflect physical symptoms and has resulted in many false positives (Benjamin, Lennon and Gardner, 1991) particularly in those with severe physical illness (Tennant, 1977).

However, the GHQ 28 has been widely used in those with physical illness (Hawton, 1981; MacGuire et al., 1974; Glass et al., 1978; Knights and Folstein, 1977) and in stroke (Ebrahim et al., 1987; Robinson and Price, 1982). Ebrahim (1990) has suggested that as 7 out of the 28 items examine physical problems, in the physically frail, depression may be over estimated. Whereas normally a score of 5 or more would be classed as showing significant depressive symptoms, Bridges and Goldberg (1984, 1986) have suggested that for those with neurological problems, a score of 12 or more should be used instead.

The GHQ 28 distinguishes different facets of mood or emotional disorder and as House (1991) has pointed out;

> *"...depression is often used as a catch-all term for emotional problems.... but the experience of these other states for patient and carer - and the best approach to management - may well not be the same for depressive disorders."*

In order to select an instrument to measure depression in the present study, it was decided to use a combination of a self-reported screening tool and a clinician rated interview. There are pros and cons to both and the combination may therefore allow access to depressive symptoms from different angles.

For example, self-report measures, rely on the respondent being honest, but at least they can generally complete the questionnaire themselves and this can sometimes overcome problems with response bias due to social desirability. That is, some people may feel awkward about reporting some symptoms face to face but may be honest if indicating a response on a sheet of paper. On the other hand, the person must be physically able to complete the questionnaire and this may exclude some patients. If someone helps the person to complete the questionnaire, then the results may have to be interpreted with caution as the questionnaire will not necessarily have been validated in this format.

Clinician ratings, following semi-structured interviews, rely on the respondent being able to communicate relatively effectively and may also suffer from problems of social desirability response bias. However, if one chooses the right instrument then it may be possible, not only to determine the severity of the depression but also to detect change over time.

For the reasons discussed above it was decided to use the scaled version of the General Health Questionnaire (GHQ 28) and the Montgomery Asberg Depression Rating Scale to measure depression in the main study. The GHQ 28 includes a subscale measuring aspects of social dysfunction which, Shah Ebrahim (1990) feels may skew scores in stroke patients. However, it may be possible to partial out the contribution of this subscale to the total score and thus allow independent interpretation of the contribution of the physical effects of the stroke to depression.

2.5 Effect on Quality of Life

In recent years there has been increasing interest in Quality of Life as more emphasis has been placed on ensuring that health care interventions are cost-effective. Effectiveness can be measured in terms of the burden placed on health and social services by peoples' physical and functional dependence or in terms of how an individual's life may be improved on all dimensions. Although, returning to a normal lifestyle is important following illness, it is notoriously difficult to define and thus to measure. Consequently, health economists and others tend to use physical or functional measures as a proxy for quality of life measures. Therefore, looking at quality of life in health economics terms is encouraging a very narrow definition of quality of life and more detailed analyses of the problems of individuals should be of paramount importance. It may be more pertinent to examine how life lives up to ones expectations rather than try to measure the perceived quality.

Quality of life has come to be recognised as being increasingly important particularly when evaluating the effect of different treatment strategies and management programmes on patients. Furthermore, it is also recognised that clinicians objectives and expectations may differ markedly from those of the patient (Bar-On,1986), and that physical aspects of quality of life are most often addressed and the psychological, social and spiritual aspects are often neglected (Wyatt & Friedman, 1996).

Sociologists often use the term "well-being" to mean quality of life though they are often referring more to housing conditions (Dale, 1980). However, quality of life is recognised to be a multi-dimensional concept, though there is little agreement in the literature about what these various dimensions are (Padilla et al., 1992). For example, this review found that quality of life had been operationalised to include a wide variety of perspectives, the comparison of desired and achievable goals, a sense of well being, feelings of control and those with a more biomedical perspective looking at functional capacity and social utility (Padilla et al., 1992). Schliephake et al. (1995) suggested that in order to determine quality of life one must assess; general factors of psycho-social functioning and physical well-being as well as the functional aspects of the particular disorder. The World Health Organisation definition is;

"a state of complete physical, mental and social well-being not merely the absence of disease".

However, quality of life remains important in the presence of disease and individuals will differ markedly in their concepts. Perceptions of quality of life are commonly recognised as changing both qualitatively and quantitatively from day to day, with age and because of differing circumstances. Basic needs must be met (e.g. food, shelter) but other more complex needs must also be addressed (e.g. socialisation, communication). There is a growing realisation that quality of life is just as important when treating patients as keeping people alive and curing disease (van Knippenberg and de Haes, 1985) although many of these aforementioned needs may be difficult to fulfil in the face of severe illness and/or disability.

A thorough assessment that examines all aspects of the disease in an appropriate way is essential for clinical practice, and for research, it is imperative that any instrument used is reliable (with good test retest reliability) and valid (Aaronson et al., 1993). It has been suggested that few studies have done this to date (Jones et al., 1992).

It is recognised that depression contributes to lack of quality of life in the elderly and those with stroke (the impact of depression in those with stroke having been described previously). However, the impact of depression on reduced quality of life is often not appreciated by clinicians (Wells et al., 1989). If both depression and quality of life are difficult to measure in a particular client group, such as those with stroke, this results in health care professionals having difficulties in deciding what direction interventions should take, on an individual basis (Wyatt & Friedman, 1996). Furthermore, it is difficult to determine the relative contributions of different problems to overall quality of life.

Meeberg (1993) has suggested that there are four critical attributes that allow the differentiation of quality of life from other similar concepts (e.g. life satisfaction, well-being); a feeling of satisfaction with life in general; the mental capacity to evaluate one's own life; an acceptable state of physical, mental, social and emotional health as determined by the individual concerned and finally an objective assessment by another that the person's living conditions are adequate and not life-threatening.

Ultimately, it may not necessarily be the actual limitations to lifestyle caused by the disorder, but how a person views their life in spite of these problems which determines adjustment. That is, how well people have psychologically adjusted to their lifestyle or health status. Several studies have examined psychological adjustment in cancer patients and have identified uncertainty, somatic and psychological distress, decreased self-esteem and body image, as well as distress related to physical problems (Corney et al., 1992; Quigley, 1989; Welch-McCaffrey et al., 1989). These reactions are unsurprising in the circumstances, but they must be identified in order that they can be addressed. Then intervention programmes, that are known to be helpful can be instigated. For example, a thematic counselling model demonstrated positive outcomes; decreased anxiety and depression, increased knowledge of the illness, increased participation in leisure activities and better relationships with close friends and relatives(Cain et al., 1986).

Therefore, identifying psychological adjustment problems in people who have just suffered a stroke, may allow similar interventions to be instigated and they too may show positive outcomes. A framework to allow staff to identify problems may help them to target interventions to the domains relevant to that individual.

In the past, studies looking at quality of life after stroke studies have also focused on the physical problems created by the illness and the consequent disability. They tend to ignore life satisfaction or living standards and concentrate on aspects of personal experience which tend to be related to health care.

Furthermore, in evaluating the effectiveness of different approaches to rehabilitation, quality of life indicators have not been used as measures of outcome , even though quality of life improvements may be more important and more sensitive to change than morbidity and mortality (Seale and Davies, 1987).

Life satisfaction or quality of life may therefore be related both to the situation a person finds themselves in and what they see as being ideal. Therefore, it may be the difference between what people actually think will help and what will actually happen to them in the future which ultimately be the best indicator of each persons' perceived quality of life (peoples' ideals as compared to reality).

2.6 Rehabilitation Pathways

Though patients may on the face of it be seen to recover, rehabilitation itself may not always be "successful". It is therefore imperative to distinguish between the two and also to show how they are inter-related.

2.61 Recovery / Independence / Dependence

The International Classification of Impairments Disabilities and Handicap (ICIDH) was developed in the 1980s to allow a more organised study of the consequences of disease (WHO, 1980). It had two main objectives:

"A. the development of a complete and continuous evaluation process for the rehabilitation of individuals and client groups;

B. the collection of regional, national or international data in order to plan interventions."

"A" is particularly useful in relation to rehabilitation.

Wade (1992) has divided recovery and management of stroke into 3 phases;

"Phase 1. The first week - differential diagnosis and treatment. At this point the type (haemorrhage or infarct) and reasons for the stroke must be elucidated. That is risk factors (vascular disease, atrial fibrillation, hypertension, smoking etc.) must be identified. Appropriate action must be taken in the form of treatment and advice....

Phase 2. The first 6 months - recovery from impairment and rehabilitation to reduce disability. Recovery occurs spontaneously over time and is fastest in the first week after the stroke but continues up to 3 months (though recovery can occur later). The main treatments available are from the therapies (physiotherapy, occupational therapy and speech therapy) after detailed assessment....

Phase 3. Six months onwards - secondary preventative measures and support services are instituted...."

Neurological and functional recovery occurs most rapidly in the first 3 months after stroke (Kelly-Hayes et al., 1989; Skilbeck et al., 1983) but some patients continue to make progress after 3 months, particularly with respect to language and visuospatial problems (Hier et al., 1983; Meerwaldt, 1983; Skilbeck et al., 1983; Andrews et al., 1981). In the Framingham study (Kelly-Hayes et al., 1989) patients were found to slow down in their improvement of motor strength and performance of self-care functions, though they continued to make some gains at this slower pace for up to a year.

The extent of recovery for individual patients is uncertain and no two people will be alike. This may lead to staff uncertainty and result in little guidance being given to patients and their relatives, particularly in terms of what to expect.

Initially expectations of recovery by the family and the patient are high and there is denial that any disability may be permanent. Stroke patients' recovery is fastest in the early weeks (Kelly-Hayes et al., 1989) so that it is probably hard for them to believe that the rate of recovery will slow down. Later (probably after the first month) there may be an appreciation that recovery may not be perfect and it is suggested that it is here in the "realisation phase" (Holbrook, 1982) where emotional problems are most likely to begin. Wade et al. (1985) points out that, initially it is the therapists who have most contact with the patient and they must be alert to unrealistic hopes. He suggests that they must attempt realism without dampening hope or enthusiasm though there is little evidence to support these assertions. In counselling, Dufrane and Leclair (1984) suggest that the use of "hope" could be an effective tool in helping stroke patients and their relatives to adjust to the eventual outcome. However, once again these suggestions were based on personal experience and no empirical evidence is presented to support these assertions.

In summary, it is generally suggested that it is best to encourage a realistic expectation of recovery by the patient, but that may not necessarily be the case. Further systematic investigation is essential, and the relationship between expectations and actual recovery in medical rehabilitation must be explored.

2.62 Medical Rehabilitation

Rehabilitation is the;

> "*...combined and co-ordinated use of medical, social, educational and vocational measures for training or retraining the individual to the highest possible level of functional ability*" (WHO),

as well as having an emphasis with the prevention of disease complications. Rehabilitation is a restorative and learning process which seeks to speed and maximise recovery. It should not only assist the patient in regaining functional independence, but should also encourage the patient to reintegrate as completely as possible into the community and a satisfactory lifestyle.

For stroke patients (and for others with functional limitations or disabilities) it is a commonly held view that rehabilitation should involve the development of an inter-disciplinary team (IDT) treatment plan. The first stage should be a thorough assessment by relevant members of the IDT (therapists, clinical psychologists, doctors, nurses, dietitians etc.) and that assessment should include the use of standardised instruments, which have proven sensitivity, validity and reliability. It is suggested that the results of these assessments should be fully documented and patients and families kept fully informed and involved. Further, that a goal-orientated treatment plan should be developed, which is tailored to the individual patient's needs (taking account of specific neurological deficits and the patient's emotional response to these deficits) and should only be formulated once thorough discussions have taken place between all members of the team together with the patient and their carers. The treatment plan should be reviewed and revised on a regular basis and progress carefully monitored with feedback being given to the patient and carer and the IDT.

At present the emphasis has been on the restoration of physical function, and staff frequently assume that patients' rehabilitation goals coincide with their own. Where attempts have been made to find out the patients' own priorities (Davis et al., 1992), the questions tend to reflect professional attitudes. Therapists and patients may put different values on daily living activities (Chiou and Burnett, 1985) and patients' views of their own functional capabilities often differ from those of both staff and informal carers (Elam et al., 1989; Rubenstein et al., 1984). It has been suggested, though not shown empirically, that such disagreements can lead to frustration on all sides and make it difficult for patients to come to terms with their disabilities (Evans and Miller, 1984). Research is necessary in order to identify these issues and subsequently determine strategies to avoid or address such problems should they occur.

Rehabilitation should be a learning experience in which both patients and their relatives are allowed to be active participants. That is, they should have the opportunity to address their questions and concerns and to ensure that they have been adequately prepared at each stage.

2.63 Psychosocial Rehabilitation

The emphasis on restoration of physical function in itself, precludes attention being paid to the psychosocial aspects of recovery (Drummond, 1988; Forster and Young, 1992).

It has been known for some time that there is a variation in the way in which individuals respond to and adapt to disease and disability. Several studies as early as the

1940s described different patterns of reaction to disease (e.g. Prichard et al., 1951 and others).

For example, four patterns of reaction to Parkinson's disease have been suggested (In, Dakof & Mendelsohn, 1986):-

"*a) well-adjusted, stable, easy going, calm, and resilient;*

b) submissive, dependent, and easily upset, though not sufficiently so to warrant psychiatric diagnosis;

c) driven, restless, suspicious, worrying, demanding, and often clinically depressed;

d) manifestly psychological ..."

It may be that stroke patients also demonstrate these different patterns of reaction to stroke illness and its resulting disability.

The psychosocial variables; personality and interpersonal factors have been compared to adjustment in Parkinson's disease sufferers (Singer, 1974; Singer, 1976; Hyman, 1972) and some have been found to have a deleterious effect on well-being. They found that those who had a low self-esteem and who felt that the prognosis was poor, readily adopted the sick role, withdrew socially and were likely to be both demoralised and depressed. Conversely, those who have calm acceptance of the disease, high hopes themselves and whose families also have high expectations of recovery, were active, sociable and had a high sense of well-being. These conclusions held even when severity of disease and disability was controlled for.

Singer's work suggests that the patient's attitudes, personality and interpersonal relationships affect response to treatment and rehabilitation and these effects may be generalisable to stroke sufferers. Therefore, it is imperative to examine factors associated with effective adaptation and psychological distress in order to identify possible ways of helping patients who have psychological problems.

2.64 Prognosis and Prediction

Severity of stroke is an important determinant of prognosis and management and ultimately may be the overriding factor in determining outcome. Nevertheless, many studies have attempted to develop models for prediction of outcome (Hier and Edelstein, 1991), some include a combination of factors (e.g. premorbid capabilities, level of consciousness and neurological impairment) and others using a single variable (e.g.urinary continence). For example, Taub et al. (1994) found that severity of disability could be predicted using degree of initial paralysis, presence or absence of incontinence and dysphagia, with a sensitivity of 67% and a specificity of 69%. These models have been shown to be no more accurate than level of consciousness alone (Gladman et al., 1992) or merely the presence or absence of incontinence during the first 24 hours (a sensitivity of 52% and a specificity of 81%) at predicting functional ability at 3 months (Taub et al., 1994). Furthermore, many of these studies are hampered by methodological issues; incomplete description of the sample, small or inadequate sample size (in relation to multi-variate method utilised), lack of detail relating to predictor variables, outcome measures and statistical methods. The main problem for many prediction studies performed is that the results can only be considered as preliminary findings as the model had not been validated in an independent sample. Frequently insufficient information regarding the mathematical model derived is supplied so precluding other investigators testing the model in their own patient group.. Furthermore, when models developed previously have been applied to an independent sample, the accuracy of the predictions made is much worse. Where complex models have been applied retrospectively to previously collected data on stroke patients, these models are much less accurate when applied prospectively to make predictions of outcome in clinical situations (Gladman et al., 1992).

Despite the robustness of these studies further work continues to be performed examining this issue. For example, Finocchi et al. (1996) examined the positive predictive value of a model based on acute signs and symptoms while others have developed prognostic scores based on disability and functional improvement in the rehabilitation phase (Stineman et al., 1997; Miyai et al., 1997). Functional Independence Measure (FIM) performance at various stages in rehabilitation was examined and described in terms of "profiles" (Stineman et al., 1997). It was found that 95% of patients with one profile (achievement of independence in eating, grooming and dressing the upper body; continence in bowel and bladder; and transfer between a bed and a chair with supervision only) were discharged home as compared to only 67% who did not achieve the same profile (Stineman et al., 1997). However, what they fail to point out is that this stage was only achieved by 26% of patients who were functioning below this stage on admission to rehabilitation. That is, 74% had already achieved this stage on admission to rehabilitation, the point at which explanatory variable were measured. It would appear that achievement of this profile was more related to the severity of the initial event than to rehabilitation. Furthermore, the accuracy of the prediction was improved by including age and pre-stroke abilities. This brings into question the usefulness of this prediction model as it is based on variables which are not amenable to intervention.

One has to question the motive for trying to predict outcome using such models. Although, it would be useful to have a predictive model based on variables that are amenable to change and would allow one to determine what interventions are needed and who would benefit the most from those that are available.

The majority of research performed thus far in examining outcome has concentrated on either predicting death or dependence using uni-variate or multi-variate analyses of functional or stroke severity items (Jongbloed, 1986). However, it is well recognised that depression (Starkstein and Robinson, 1989; House et al., 1991) and possibly other psychological factors may affect outcome regardless of the severity of stroke.

Furthermore, it may be more useful to predict outcome in terms of the quality of life of stroke sufferers or other psychological outcome variables, though little work has been performed in this area (Ebrahim et al., 1990). This is despite the fact that it has been shown that quality of life (as indicated by reduced uptake of leisure activities and general satisfaction with life) continues to be reduced to at least four or even six years post stroke (Bernspang et al., 1987; Gresham et al., 1979) and it probably continues after this although no longitudinal studies have addressed this issue.

This chapter has aimed to give the reader an understanding of all of the possible problems a stroke sufferer may face both in the short and long term and to highlight the necessity for therapy and support services.

Health and social services provision should not merely address problems relating to disease; impairments, disabilities and handicap in the short term and fail to address even these issues in the long term. A recent audit performed on 539 acute strokes admitted to Liverpool hospitals between January and June 1996 (results as yet to be published) has shown that patients, despite being dependent, receive little health and social services input post-discharge. Less than 10% of patients received either occupational therapy or physiotherapy, this was generally supplied by the hospital either as an outreach service or outpatient service but had stopped by 6 months post-stroke. Less than half of the families had been visited on even one occasion by the stroke family support service provided by the Stroke Association and none had been seen by a clinical psychologist. Formal support services (e.g. home help, meals on wheels) were received by less than a third of patients, however, were present these services tended to start immediately on discharge and continued to be in place at 12 months post-stroke. If patients had in fact recovered completely by 12 months post-stroke, the withdrawal of rehabilitation and support services would seem reasonable. However, more than two thirds of stroke survivors had significant disability (e.g. Barthel ADL Index scores of less than 18) and continued to require assistance with even basic tasks.

This lack of practical help is exacerbated by the total disregard for the psychosocial aspects of stroke illness for both stroke sufferers and their carers.

Because these services are costly, staff are encouraged to target available services at those who would benefit. However, there have been few studies that have examined empirically which patients are likely to benefit and those who are not. Furthermore, the current system allows staff themselves to decide who they think will benefit most.

The following chapter will examine whether therapy staff can predict future functioning from current functioning in order to identify those patients who will do well, those who will make little progress and those who are likely to deteriorate or die. The predictive validity of two different classification methods will be compared and contrasted.

Chapter 3

Can Therapists Predict Outcome?

3.1 Background

In the previous chapter the range of physical and psychological consequences of stroke were summarised and the issue was raised regarding staff being expected to target rehabilitation resources at those who would benefit most from it. It is recognised that prognostication is important at an early stage for patients and relatives and for the planning of rehabilitation. In this chapter the thesis discusses the rationale for, and the possible consequences of, using therapists' predictions to guide whether rehabilitation effort should be invested in particular patients or not. Firstly, existing literature will be reviewed and subsequently, studies that were aimed at addressing the basis for and reliability of therapists' predictions will be described and the results discussed.

The World Heath Organisation (1989, p1429) has recognised the necessity for and problems with the identification of patients who will benefit from rehabilitation:

"Since rehabilitation can be costly, the development of improved criteria for selecting patients for intensive rehabilitation is of the utmost importance" and goes on to say:

"Such selection should be based on the prognosis of recovery of function(s) in three main groups: (1) patients who spontaneously make a good recovery without rehabilitation; (2) patients who make satisfactory recovery only through intensive rehabilitation; (3) patients with poor recovery of function irrespective of the type of rehabilitation.

They also point out that there is little evidence to allow *"clear delineation between these groups"* and it is suggested that controlled clinical trials are necessary to identify those who will benefit from rehabilitation.

In the meantime we are left to rely on information that is currently available. In the previous chapter it has been suggested that for the majority of stroke sufferers, health and social services support are rarely commenced after discharge. If therapy or support services are commenced then they are subsequently withdrawn at an early stage regardless of whether patients continue to have functional problems or not. Analysis of recovery patterns (e.g. taking note when patients do not do as well as staff expect) could help us to alter and improve care in areas that are needed.

The accuracy of therapist predictions has been examined by Korner-Bitensky et al. (1989) who investigated whether therapists could make detailed predictions so that specific rehabilitation targets could be set. Therapists were asked to assess stroke patients' performance on specific activities of daily living using the Adapted Patient Evaluation Conference System (APECS). This was originally developed as a 14 item assessment, each item is rated on an 8 point scale, 0 being not assessed, 1 needing maximal assistance to 7 being independent without assistive device (Harvey and Jellinek, 1981). However, Korner-Bitensky et al. (1989) used only 7 of the items which addressed motor and function, but continued to rate each item on the 8 point scale. The use of this scale in this format had not been previously validated. On analysing the data, when the predicted scores for each item were compared with the scores actually achieved, the raw scores were not used. The researchers dichotomised the scoring into "dependent" (0-4) and "independent" (5-7). This would obviously give an appearance of increased accuracy of prediction. It was concluded that therapists were more optimistic than pessimistic. In cases where therapists were inaccurate, they were on average 3 times more optimistic than pessimistic. Interestingly, staff with more years (>6 years) of experience were more optimistic (they predicted that patients would get more independent {Goal score}than was actually achieved {discharge score}) and were less accurate, than student therapists (40% versus 28% for being over optimistic; 51% versus 67% for accuracy, respectively). Furthermore, therapists were asked to make predictions of discharge APECs one week after admission to a rehabilitation unit. These predictions were then used to set goals for therapy and once the goal was achieved then the patient would be discharged. Whilst this approach is useful clinically, for research purposes, independent outcome assessment would make the results more meaningful. Nevertheless, therapists were shown to be over optimistic for most patients, which they contend is probably beneficial for the patients, although no data is presented to support this assumption. However, for those patients with a high initial ADL score, it was found that therapists were more likely to be accurate, and they were also more likely to predict more improvement in those patients with higher initial scores.

The results of this study and other studies should therefore be interpreted with caution. For example, Korner-Bitensky et al. (1989) and others (e.g. Rosenthal et al., 1965; Boureston, 1967) have performed initial assessments of patients at different time points follows the onset of stroke and so patients could have been at a quicker or slower recovery phase. That is, those who are studied earlier in the time course of the stroke are more likely to show more change in their functional status than those who are studied later. This is a problem which could have been overcome by making initial predictions at set time intervals post-stroke (e.g. Wade, 1992). Measuring outcome at set intervals post-stroke is also essential (Jongbloed, 1986) as this eliminates the problems of using discharge as the endpoint. In the Korner-Bitensky et al. (1989) study, discharge was used as the time for final assessment and the time point at which it was decided whether predictions were accurate. However, using discharge status confounds the results as patients are generally only discharged when they have achieve their target level of independence. Therapists' predictions would thus merely be a self fulfilling prophesy. Patients would have been given more therapy and the patient's length of stay would have been increased if necessary in order that the patient actually achieved the desired goals. Therefore, in the context of the Korner-Bitensky (1989) study, those they expect to do well will do well and those they expect to do badly will do badly with the likelihood being that all patients will achieve what was predicted for them. Conversely, some predictions may appear to be inaccurate as some patients may actually be discharged prematurely due to depression, home or family circumstances or because of concurrent, though unrelated medical problems (Lincoln et al., 1989). Therefore, they would not have the opportunity to achieve their targets.

If therapist predictions are to be used to determine who will benefit most from therapy, this necessitates prognostication at an early stage. Studies (e.g. Korner-Bitensky, 1989) where predictions are only made after some treatment decisions have already been made, i.e. admission to a rehabilitation unit, will be less useful in allocating therapy resource. Should it be possible to develop an accurate model to identify those who would benefit most at an early stage, then treatment or non treatment decisions and implementation of appropriate management strategies could be instigated in the appropriate patient group.

Comparison of different methods of predicting outcome is difficult as not only do some studies use uni-variate or multi-variate regression models, they also use different scales in each study. Furthermore, some studies used actual functional level achieved ultimately and others used change in function over a period of time (Jongbloed, 1986). Functional level achieved and change in function from initial score, as Jongbloed (1986) pointed out, are very different measures and some studies included much milder subjects who had little *"room for improvement"*.

For the purpose of this thesis, it was decided to perform a sub-study to determine the baseline statistics for patients getting better, getting worse or staying the same and, considering these figures, determine whether therapists are too optimistic when predicting rehabilitation outcomes at an early stage post-stroke. The study aims to;

1: Examine the reliability of the classification of predictions based on two different methods of assessment early post-stroke.

2: Examine the accuracy of prediction from current functioning to future functioning.

3.2 Subjects and Methods

Acute stroke patients admitted consecutively to a large teaching hospital between January and June 1992 were included in the study. Each patient had a primary diagnosis of acute stroke confirmed by the stroke research team. Basic demographic details were collected, as well as type of ward admitted to and discharged from. The patients' usual residence and where they were discharged to was also recorded as part of a standardised data collection sheet.

Physiotherapists employed to provide therapy to patients with neurological problems (no stroke unit existed at this Liverpool hospital at this time) participated in the study. The physiotherapists' sex, therapy grade and number of years of experience were noted.

A member of the stroke research team visited the ward to obtain assessments on all stroke patients on Day 7 (post-stroke). The physiotherapist who was treating that patient was approached by a member of the research team and was asked to complete a series of assessments for that patient; the current Barthel for each of the 10 items, a prediction of the score (for each Barthel item) that they thought the patient would achieve by 3 months post-stroke (predicted Barthel) and their general impression of how the patient would be in 3 months time using the Global Prediction scale. They were reassured that their responses would be kept confidential.

For those who were still in-patients at 3 months (post-stroke) the ward was again visited, the patient's primary nurse identified and they were then asked the patient's current Barthel score. For those who had been discharged by 3 months post-stroke the carer (whether professional or a relative) was telephoned and was asked the patient's current abilities for each item on the Barthel score.

3.3 Assessments of functional status and statistical tests

Barthel Activities of Daily Living Index (Barthel)

The Barthel (Mahoney and Barthel, 1965; Wade and Collins, 1988) is a measure of activities of daily living (ADL) and addresses ten areas (see Appendix 1) of basic physical function (e.g. mobility, transfers, urinary continence) and takes less than 30 seconds to administer. Each item on the scale has an accompanying phrase which describes how to score each item. It was designed to measure what people actually do and not what they can do. That is, if a person lived in a bungalow and never went up the stairs, then they would be recorded as being dependent for the ADL of "stairs". The most common scoring system used is 0 to 20, where a score of 0 indicates that the person is dependent for each of the ten items and where a score of 20 indicates that the person is independent for each of the ten items. Each item is rated on a two, three or four point scale, from independent to dependent.

The Barthel, is a widely accepted and widely used measure of ADL. It has good inter and intra rater reliability, is quick and easy to use and does not require specific training. Therefore, it was decided that it would be the most suitable ADL scale to use for this study.

Global Prediction

The "global prediction" was a measure designed specifically for this study. It consists of a 5 point Likert (1952) scale; much worse, worse, same, better, much better. The respondent is asked to indicate, by circling one point on the scale, a response to the question:

"Overall, how do you think the patient will be in three months time?"

Kendall's tau-b

Barthel scores and Global Predictions produce data which is ordinal in nature and which are possible to rank. The most appropriate statistical test that could be used to measure the correlation between these ordered pairs of data is Kendall's tau. The rationale for this is as follows; for this particular study, it was possible that pairs of data could be concordant, discordant or tied. Because there was the possibility of ties, and because this results in a narrower range of possible values, Kendall's tau-b was to be used for comparison. The choice of this measure is explained in the SPSS manual (1993) where it is said to:

normalise the difference between P-Q...where P is the number of concordant pairs and Q is the number of discordant pairs... by considering ties on each variable in a pair separately but not ties on both variables in a pair"

3.4 Results

Over a six month period 224 acute stroke patients were admitted. However, for 6 patients no initial prediction data was obtained as they either died (4) or were discharged within the first week (2). All 218 patients who were still in hospital at Day 7 had a current and predicted Barthel score obtained, however, for 1 patient the physiotherapist failed to complete the Global Prediction. Seven different therapists, all females, with a median number of years qualified of 4 (range 2-14) were included in the study. All were either Senior 1 or Senior 2 grade (i.e. no basic grade and newly qualified staff were recruited).

As non-parametric statistics will be used for comparisons, medians and inter-quartile ranges (IQRs) are shown, for the remaining variables to be examined, in Table 2 below.

Table 2. Details of numbers of assessments possible and performed at Day 7 post-stroke

	Current Barthel Score	Predicted Barthel Score	Predicted Change in Barthel Score	Global Predictions
N	218	218	218	217
Median	6	14	4	4
IQR	1-13	8-19	0-8	3-5

As can be seen in Table 2 at least 50% of patients were severely disabled at this stage having Barthel scores of 6 or less. A further 25% were moderately to severely disabled, having Barthel scores of less than 14.

Figure 1a

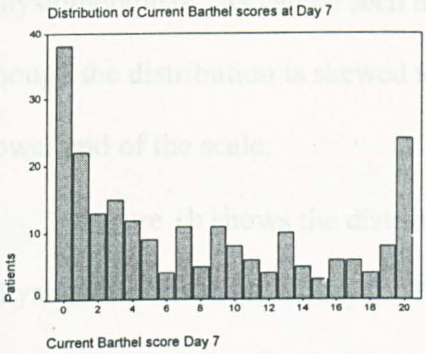


Figure 1a shows the distribution of Current Barthel scores made at Day 7 by the physiotherapists. As can be seen there is clustering around either end of the scale, though the distribution is skewed to the right, with the majority of patients being at the lower end of the scale.

[illegible]re 1b shows the distribution of Barthel scores for 3 months post-stroke that p[illegible]. The distribution is skewed to the left, with the most commonly occurring Barthel scores predicted as being at the top end of the scale.

Figure 1b

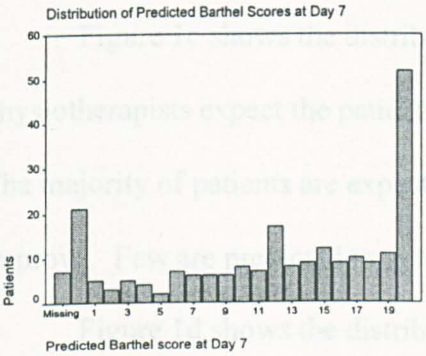
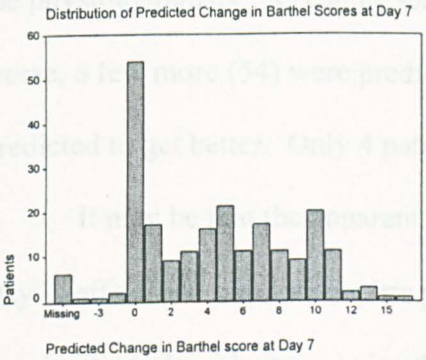


Figure 1c shows the distribution of change in Barthel scores that the physiotherapists expect the patients to achieve between Day 7 and 3 months post-stroke. The majority of patients are expected to make little change in Barthel score or to improve. Few are pre[illegible] worse.

Figure 1d shows the distribution of Global Prediction scores made at Day 7 by the physiotherapists. As can be seen only a few (19) patients were predicted to get worse, a few more (54) were predicted to stay the same and the majority (143) were predicted to get better. Only 4 patients had died at this stage.

Figure 1c



It may be that the apparent severity of stroke (as indicated by the Barthel score at Day 7) [illegible] predictions about expected improvement or deterioration. In order to examine the relationship between apparent severity of stroke and expected functional achievement, current and predicted Barthel scores are compared in Table 3 below. Numbers shown indicate the number of patients with that current Barthel score as compared to the predicted Barthel score made at Day 7 indicating the level of functional ability expected to be achieved by 3 months post-stroke. The diagonal line of shaded boxes demonstrates where current and predicted Barthel scores are in perfect

Figure 1d

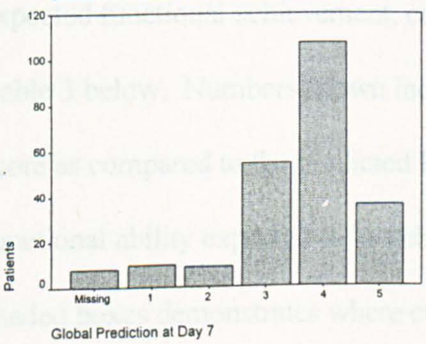


Figure 1a shows the distribution of Current Barthel scores made at Day 7 by the physiotherapists. As can be seen there is clustering around either end of the scale, though the distribution is skewed to the right, with the majority of patients being at the lower end of the scale.

Figure 1b shows the distribution of Barthel scores for 3 months post-stroke that physiotherapists made at Day 7. The distribution is skewed to the left, with the most commonly occurring Barthel scores predicted as being at the top end of the scale.

Figure 1c shows the distribution of change in Barthel scores that the physiotherapists expect the patients to achieve between Day 7 and 3 months post-stroke. The majority of patients are expected to make little change in Barthel score or to improve. Few are predicted to get worse.

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It may be that the apparent severity of stroke (as indicated by the Barthel score at Day 7) affects the physiotherapists predictions about expected improvement or deterioration. In order to examine the relationship between apparent severity of stroke and expected functional achievement, current and predicted Barthel scores are compared in Table 3 below. Numbers shown indicate the number of patients with that current Barthel score as compared to the predicted Barthel score made at Day 7 indicating the level of functional ability expected to be achieved by 3 months post-stroke. The diagonal line of shaded boxes demonstrates where current and predicted Barthel scores are in perfect agreement, that is, where the patient is predicted to have the same Barthel score at 3 months post-stroke as they have at Day 7. Those patients above the line are predicted to get better and those below the line are predicted to get worse.

Table 3 Comparison of Current Barthel at Day 7 with Predicted Barthel at Day 7

	Predicted Barthel																				
Day 7 Barthel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
0	19	3	1	1			1	1	3	1	1	2	1								
1	2	2	1	1	2	1	4	1	1	1	2	1	2				1				
2			1	3				1		3			4		1						
3					1	1	1	2	1		1	1	2	3	1						
4					1			1		1	2		2	1	2	1		1			
5											1		3			2	1				
6													0				1	2		1	
7											1	2	2	3				1	1		1
8									1							1		1	2		
9							1					1		1	1	1	2	1		2	1
10															1	4		1		1	1
11															1	2	1		1		1
12													1								3
13																		3	3	1	3
14															2					1	2
15																	1			1	1
16																	2		1		3
17																			1	1	4
18																				1	3
19																				2	6
20																					23

As can be seen in Table 3 above, only 3 patients were predicted to be worse at 3 months, 54 were predicted to be the same, and the remaining 161 were predicted to be better. It would seem that those with higher Barthel scores are no more likely to be predicted to get better than those with low Barthel scores. *However, of those predicted to be the same, 42 (78%) scored 0 or 20 and could not be predicted to be worse or better using the Barthel scale.*

In order to further examine the relationship between apparent severity of stroke and expected change in function over time, current and predicted Change in Barthel scores are compared. For clarity, Table 4 has been produced to show the relationship between these variables. Numbers shown indicate the number of patients with that current Barthel score as compared to the predicted Change in Barthel score made at Day 7 indicating the level of change in functional ability expected by 3 months post-stroke.

Table 4 Comparison of Current Barthel at Day 7 with Predicted Change in Barthel at Day 7

	Predicted Change in Barthel																				
Day 7 Barthel	-5	-4	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0						19	3	1	1			1	1	3	1	1	2	1			1
1					2	2	1	1	2	1	4	1	1	1	2	1	2				1
2						1	3				1		3			4		1			
3							1	1	1	2	1		1	1	2	3	1				
4						1			1		1	2		2	1	2	1		1		
5											1		3			2	1				
6																1	2		1		
7									1	2	2	3				1	1		1		
8						1							1		1	2					
9			1					1		1	1	1	2	1		2	1				
10										1	4		1		1	1					
11									1	2	1		1		1						
12						1								3							
13										3	3	1	3								
14						2					1	2									
15							1			1	1										
16						2		1		3											
17							1	1	4												
18							1	3													
19						2	6														
20						23															

It would seem that those with higher Barthel scores are no more likely to be predicted to get better than those with low Barthel scores. In fact, proportionately, those with lower Barthel scores are predicted to make larger functional gains. *However, in Table 4 (as previously shown in Table 3) of those predicted to be the same, 42 (78%) scored 0 or 20. Those scoring 0 could not be predicted to get wors, whilst those scoring 20 could not be predicted to get better using the Barthel scale.*

Table 5 Comparison of Current Barthel at Day 7 with Global Prediction rated at Day 7

	Global Prediction at Day 7				
Day 7 Barthel	Much Worse	Worse	Same	Better	Much Better
0	9	5	16	7	
1	1	1	7	11	
2			4	7	1
3			3	9	3
4		1	1	9	1
5			1	6	1
6				2	2
7			1	7	3
8			1	2	2
9		1		8	2
10				5	3
11				5	
12			1	1	2
13				5	5
14			2	2	1
15				2	1
16				3	3
17				4	1
18				3	1
19			2	3	3
20		1	15	6	1

As can be seen from Table 5 above, when making Global Predictions, therapists would appear to be more likely, than when using Barthel predictions, to suggest that people will get worse. However, as with Barthel predictions, the majority continue to be considered to be likely to get better and some to make no change. It should be noted, that there are 31 patients who have Barthel scores of 0 or 20 (i.e. at the extremes of the scale, with little room for change), and who, despite therapists using Global Predictions, are rated as being expected to stay the same.

The strength of the associations between these ratings, (as indicated by Kendall's' tau-b) are summarised in Table 6 below in order to assist in the comparison of ratings from different perspectives.

Table 6 Correlations (Kendall's tau-b) between Current Barthel, Global Predictions, Predicted and Predicted Change in Barthel Score at Day 7

	Current Barthel at Day 7	Global Prediction	Barthel Prediction	Predicted Change in Barthel
Current Barthel		0.27***	0.74***	-0.21***
Global Prediction			0.44***	0.51***
Barthel Prediction				-0.34NS
Predicted Change in Barthel				

***=p<0.0001, NS=p>0.05

When Global and Barthel predictions are correlated with current Barthel score at Day 7 both are statistically significant ($p<0.0001$). Though it would seem that the association between current Barthel (Day 7) and predicted Barthel (for 3 months) is stronger (tau-b=0.74) than the association between current Barthel and Global predictions at the same time point (tau-b=0.27). However, this may be due to different scaling for each measure.

When one examines the relationship between Global predictions and predictions made using the Barthel, there is a significant positive relationship between the former and the actual Barthel predicted (tau-b=0.44). However, the relationship between Global predictions and the predicted change in Barthel appears stronger (tau-b=0.51). When the predicted Barthel and predicted change in Barthel are compared, the relationship it is not statistically significant (tau-b=-0.34, $p>0.05$), that is therapists do not predict more change in those who are expected to do well or those who are expected to do badly.

Thus far, we have been concerned with comparisons of the different systems of predicting outcome and it is now necessary to examine the accuracy of prediction from current functioning to future functioning.

By 3 months post-stroke, of the 218 patients who had initial data collected, 142 had been discharged either to their own home (112 (51%)), or to an institution (30 (13%)) and a further 11 (5%) were still in hospital. Unfortunately, a further 65 (31%) patients had died and Barthel scores were obtained for 74 patients (33%). The remaining 79 (36%) were unable to be contacted at 3 months.

When comparing those in whom outcome data was obtained and those who were unable to be contacted, though there was no statistically significant difference in age (t=1.05, p>0.05), the former had statistically significantly higher Barthel scores at day 7 (t=-2.08, p<0.04).

Assessments performed are shown in Table 7 below. As non-parametric statistics will be used for comparisons, medians and inter-quartile ranges (IQRs) are shown.

Table 7 Details of numbers of assessments possible and performed at Day 7 and at 3 months post-stroke (descriptive statistics for functional scores and predictions are shown)

		Current Barthel Score	Predicted Barthel Score	Global Predictions
Day 7	N	218	218	217*
Day 7	Median	6	14	4
Day7	IQR	1-13	8-19	3-5
3 months	N	74**	-	-
3 months	Median	16	-	-
3 months	IQR	8-19	-	-

N=assessments, *1 missing data, ** 79 patients lost to follow up and 65 dead

Figure 2

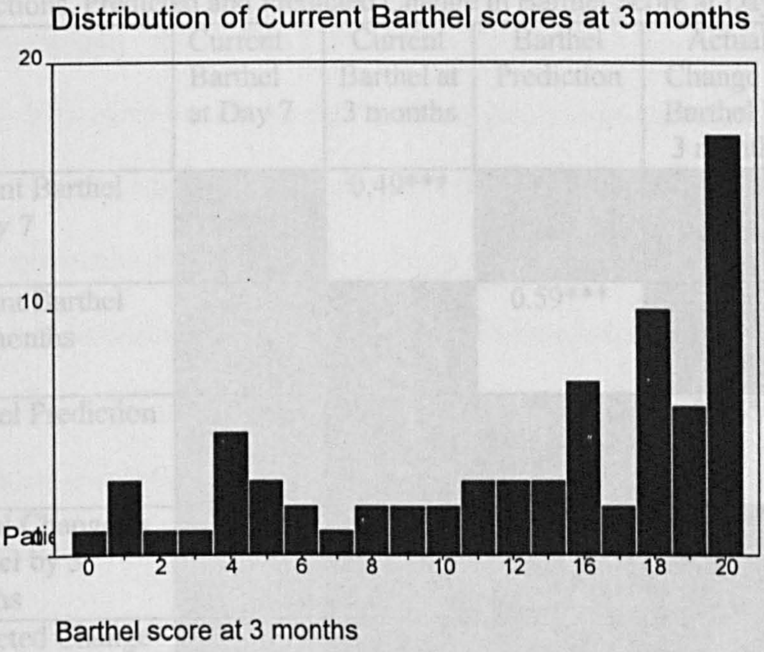


Figure 2 above shows the distribution of Current Barthel scores at 3 months. The distribution is negatively skewed, with only 25% of patients having Barthel scores of 8 or less. The majority of patients are relatively independent for most of the 10 activities of daily living.

Table 8 Correlations (Kendall's tau-b) between Current Barthel at 3 months, Global Predictions, Predicted and Predicted Change in Barthel Score at Day 7

	Current Barthel at Day 7	Current Barthel at 3 months	Barthel Prediction	Actual Change in Barthel by 3 months	Predicted Change in Barthel	Global Prediction
Current Barthel at Day 7		0.49***				
Current Barthel at 3 months			0.59***		-0.16 NS	0.20*
Barthel Prediction				-0.25**		
Actual Change in Barthel by 3 months					0.51***	0.32**
Predicted Change in Barthel						0.50****
Global Prediction						

NS=p>0.05, *=p<0.05, **=p<0.01, ***=p<0.001, ****=p<0.0001

As can be seen from Table 8 above, a significant relationship exists between the Barthel at Day 7 and the Barthel at 3 months (tau-b=0.49, p<0.0001).

Both Global and Barthel predictions are significantly correlated with Barthel at 3 months (see Table 8 above). The Global prediction is significantly positively correlated with Barthel and with change in Barthel by 3 months. However, although predicted and actual Barthel achieved by 3 months are significantly positively correlated, the Barthel prediction shows a significant negative correlation with the actual change in Barthel by 3 months post-stroke (tau-b= -0.25, p <0.004). That is, those with higher predicted Barthel scores actually changed less by 3 months and those with lower predicted Barthel scores actually changed more.

3.5 Discussion

This study has shown that therapists can, predict on Day 7 post-stroke, outcome at 3 months using either a Global rating or a rating based on specific items on the Barthel Index give some indication of likely future status. A statistically significant relationship exists between Global predictions, predictions based on Barthel Index items (either actual score to be achieved or change in score by 3 months) and actual or change in Barthel scores achieved by 3 months. However, there are a number of factors (both strengths and limitations) that must be considered when interpreting the results of this study

Consecutive people admitted to a large teaching hospital with a diagnosis of acute stroke were systematically identified. All patients were included in this study whether they were likely or unlikely to be transferred to the rehabilitation unit at some point during their hospital stay. This is in contrast to previous studies, (for example, Korner-Bitensky et al., 1989) which have only included patients referred to the rehabilitation unit. That is, this study examined a complete cohort of patients with the whole range of stroke severities from the very mild to those requiring constant attention.

At Day 7 only 19 (9%) patients were predicted to get worse, 54 (24%) were predicted to stay the same and 143 (67%) were predicted to get better. Only 4 patients had died at this stage. and as one would expect a further 68 patients to die before 3 months (if one assumes that a third of patients die in the first 3 months) it would seem, even based on these estimates, that therapists are being over optimistic. It would seem that therapists use "better" ratings more than "same" or "worse" and are exceedingly over optimistic. This confirms the findings of previous studies (e.g. Korner-Bitensky et al., 1989) who also found that therapists were over optimistic for most patients. Korner-Bitensky et al. (1989) also asked therapist to make predictions at an early stage (at one week post-stroke). However in contrast to our study, they used discharge as the time for final assessment. As previously discussed, this design can confound the results. For example, therapists made predictions and then based therapy on the "goals" that were set. Furthermore, goals were to be achieved before patients were allowed to return home. Theoretically patients would not be allowed home until they had achieved the required goals and therefore, to some extent, therapists were making self-fulfilling prophesies and it is unsurprising that their predictions were accurate. Although it is acknowledged that in clinical practice discharge may be hastened or delayed by factors independent of patient progress or therapists decision making.

In this study, when predictions were compared with actual outcome at 3 months post-stroke in terms of activities of daily living. The 3 month stage was selected as this time point is generally assumed to be the end of the most rapid recovery period, although patients do improve beyond this point (e.g. Wade and Hewer, 1987).

When comparing current Barthel at day 7 and that expected to be achieved by 3 months post-stroke, it would seem that those with higher Barthel scores are no more likely to be predicted to get better than those with low Barthel scores. However, of those predicted to be the same, 42 (78%) scored 0 or 20 and could not be predicted to be worse or better using the Barthel scale. This clearly demonstrates the floor and ceiling effects of this particular ADL scale. Only survivors could and have been assessed at 3 months. Comparisons are therefore only possible in survivors who would have both actual and achieved ADL scores.

The inclusion of a more global outcome, as with the initial global prediction, would have allowed further comparisons to be made which included those who had died. This is important because a significant number had subsequently died (31%). This was compounded by the high (36%) attrition rate. Those lost to follow up were significantly older, but had not had more severe strokes originally. Nevertheless, they may have been less likely to actually have a telephone or have been more prone to deterioration. Consequently, they may; have had difficulty in answering the phone, or have been more likely to have changed their address, either to move in with a friend or relative or to be admitted to institutional care. The results of this study can therefore only be generalised to similar survivors.

It is possible that the Barthel outcome scores could have been grouped as better, same or worse, with worse including those who had died. This would have facilitated comparison with the global predictions and comparison or predictions in survivors and those who had died. However, it was felt that as with the Korner-Bitensky et al. (1989) study, that this may have increased the apparent accuracy of predictions where little existed.

This study assessed patients early after stroke, as suggested by Wade (1992) as it was felt that only early predictions would be useful in targeting therapy at those who would benefit most. That is, prognostication should occur at an early stage with a subsequent early commencement of therapy. Nevertheless this also means that therapists have little experience of each individual patient and this may reduce the accuracy of their predictions. Wade (1992) has also suggested that previous studies have include a majority of patients with little room for improvement. In this study less than 10% of patients had a

Barthel score of 20 at Day 7, with more than 75% having Barthel scores of less than 14 and thus being a dependent group of patient with much room for improvement. However, the floor and ceiling effects of the Barthel may have resulted in people not being able to be predicted as getting better or worse when using the Barthel Index items (Jongbloed, 1986). That is, the Barthel score does not give the degree of dependence past a certain point, that is, those scoring 0 can not be scored lower even if they deteriorate. Conversely, it does not give the degree of independence above a certain point, that is, those scoring 20 can not be scored any higher even if they improve.

However, this problem may be more apparent than real within this study. Even when the Global Prediction ratings are used at Day 7, there are still 31 patients who have Barthel scores of 0 or 20, and who, despite being rated on Global Predictions, continue to be expected to stay the same. That is, though it could appear that when these ratings are made using the Barthel score, that the "same" category is merely a constraint of the floor and ceiling effects of the scale, this is not in fact the case. That is, if therapists felt that these people would deteriorate or get better, they would have been able to indicate this using the Global Prediction rating.

It is also insensitive to change at the upper end of the scale, for example, a person can be virtually independent if not required to be able to climb a flight of stairs unaided. They would then score 19 on the Barthel, however, to score 20 they would have to make a substantial improvement which would allow them to climb a full flight of stairs completely unaided. However, in terms of dressing, if someone could do everything else in the way of dressing except to be able to do up one button on a cuff and then achieved this ability, they too could improve one point on the Barthel. Further, a person scoring 5 would appear to have made a huge improvement by gaining 5 points to make a Barthel score of 10, but they would still be dependent on another person for each of the 10 activities of daily living. That is, the scoring method is inconsistent across activities.

The cause of the dependence is also not identified and Wade (1992) has suggested that ADL scales often include " *what would normally be considered impairments; in particular, continence.* " The other problem is that each item is not necessarily distinct from every other item. For example, mobility and the ability to transfer from bed to chair (*"transfers")* are frequently dependent upon or related to one another.

Though previous studies (for example, Korner-Bitensky et al.,1989) found that more junior staff were better at predicting outcome, it was not possible to assess this in this study. Hospital policy necessitated that only experienced, Senior I or Senior II therapists with experience in neurological disorders provided therapy to people who had recently suffered a stroke. However, in this study, where predictions are inaccurate, therapists have tended to be over optimistic and this is similar to the results of Korner-Bitensky et al. (1989).

As suggested, a standard time point since stroke onset, 3 months, was used to assess outcome (Jongbloed, 1986). This should overcome the problems of previous studies which have used discharge as the outcome. Independent outcome assessment was used, although Barthel scores were obtained either from the nurse, for inpatients, or from the carer, for those previously discharged. It could be suggested that the use of different raters in different settings may have confounded the results.

Nevertheless, the Barthel was designed, and has been validated for, administration in a variety of formats. For example, it has been shown to be reliable when administered face to face or by telephone interviewing (Ebrahim et al., 1985). Several studies have demonstrated that it has good inter and intra-rater reliability (e.g. Granger et al., 1979; Shinar et al., 1997; Wade and Collins, 1988). However, although the Barthel Index has been shown to be reliable in these previous studies, it must be acknowledged that in this cohort, there may be a systematic bias in the way that either therapists, nurses or carers (whether formal or informal) rate items and could lead to the appearance of discrepant values. No account has been taken of the difference in raters.

Predictions were based on different perspectives. The Global prediction was asking people about overall improvement or deterioration (i.e. expectations of change in overall status), whereas Barthel predictions were asking therapists to rate the level likely to be achieved on specific items of ADL (i.e. scores on individual activities to be achieved by 3 months). These are different modalities and it may be misleading to compare predictions made in apparently different ways. Post-hoc, the predicted change in Barthel score to be achieved by 3 months post-stroke was examined and generally proved to be more closely related to global predictions and to be more closely correlated with actual outcome at 3 months. With hindsight it may have been better to ask therapist to predict change in Barthel score directly, instead of merely inferring it from the data.

If one examines the relationship between predictions, and predictions and outcome statistically, it would appear that a significant relationship exists regardless of the method used. However, the accuracy of these predictions for individual patients is questionable, as predictions (by whatever method) generally account for less than 35% of the variance. These results confirm the results of previous studies (e.g. Lincoln et al., 1990; Korner-Bitensky et al., 1989). As suggested by these previous studies, in order to use these predictions to determine whether therapy is provided or withheld, predictions would need to not only account for much more of the variance, but to be accurate on an individual basis.

Previous studies examining uni-variate or multivariate models (e.g. Barer, 1989; Gladman et al., 1992) based on simple information available routinely at admission or collected routinely during the patient's hospital stay have accounted for larger amounts the variance. For example, Gladman et al. (1992) found that the single variable of continence at 4 weeks post-stroke was predictive of outcome in terms of Barthel Index (Spearman's rho=0.71, p<0.001). Continence alone accounted for over 50% of the variance.

It is possible that variables not assessed in the context of this study are actually confounding our results. No account has been taken of intervening events such as further strokes, concurrent illnesses, changes in social support, other life events or psychological morbidity.

In summary, there is a relationship between therapist predictions and outcome in terms of Barthel, activities of daily living scores. Predictions made tend to be over optimistic and therapists rarely predict patients to get worse, even when using global scores. The attrition rate in this study was high and renders even these results difficult to generalise to other centres.

Previous predictive models using simple indicators, (e.g. continence) are able to provide better predictions. Nevertheless, even the latter models only account for approximately 50% of the variance. Predictive models must be improved if they are ever to be safely used to allocate therapy or other health and social services resources.

Ideally prediction models should be developed by pooling data collected at different centres. Assessments should be performed at set intervals after the stroke and all data collected should be standardised using well validated and reliable measures that are suitable for this particular client group. Results are inevitably confounded by a number of factors, not least that therapists probably already give more therapy to those they feel will do well and less to those that they feel will do badly.

Consequently, at this present time, no suitable model exists to target resources at those most likely to make a good recovery and have a good prognosis. It may be that these people would actually make a good recovery in spite of rehabilitation efforts due to "natural recovery". On the other hand it is also difficult to decide if resources should be channelled into patients who are only likely to make limited amounts of recovery and who would continue to have a poor prognosis despite rehabilitation efforts.

At present it would seem when examining the casemix of in patients on Liverpool's stroke rehabilitation units (audit of cohort of Liverpool strokes as yet unpublished - report provided to Liverpool Health Authority) that it is those in the moderate stroke group who tend to get all the therapy as it is they who are thought most likely to benefit from very intensive rehabilitation programs. Those who are considered severe or very mild are discharged either to nursing homes or their own homes with little therapy input as they are considered least likely to benefit.

Currently, no evidence exists to back up these assumptions and until some hard data is produced staff will continue to target rehabilitation at those they judge, by "experience", to feel will benefit most.

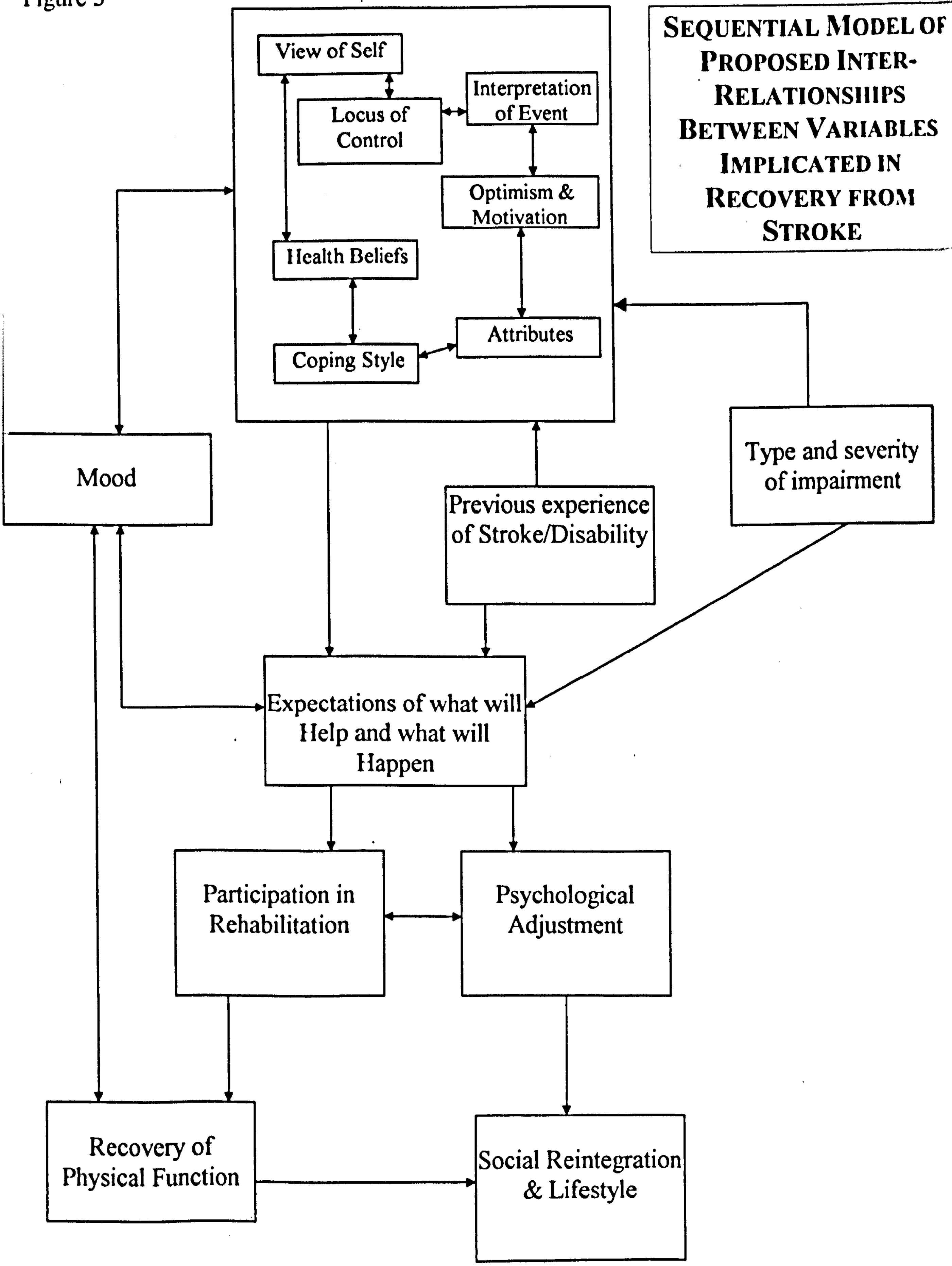
Therapists enacted attitudes may be more positive or negative depending upon their predictions of recovery for individual patients. That is they may already allocate or withhold therapy depending upon their expectations of recovery for individual patients. These attitudes and behaviours may also affect the way patients' respond to any therapy that is provided.

The possibility that patients may also make their own predictions about the future and may make more or less effort depending how "positive" or "negative" they feel must also be considered. Furthermore, it has been recognised that patients' predictions and goals may not coincide with those of hospital staff and that these clashes may have a detrimental effect not only on the patients' perception of, but their actual participation in the rehabilitation process (Wade et al., 1987; Bar-On, 1986; Hill, 1978).

Doctors and Nurses were viewed by patients as peripheral to their rehabilitation, whilst therapists (occupational and physiotherapists) were viewed as instrumental in the patient's recovery. It was suggested that this was due to doctors and nurses being perceived by patients as not talking to them and not explaining the details of their illness, whilst therapists were perceived as communicating with them and understanding their personal needs (Hill, 1978). A simple tool which could be used by any discipline may facilitate the identification of patient's problems and make make patients feel that all staff are interested in them. The development of such a tool is described later in this thesis.

The following chapter will start by describing a model developed by the author, based on current theories, by which it is suggested that patients develop their ideas about what will help them to get better and what they think will happen in the future. The next chapter will try to demonstrate how previously established lay theories and health beliefs, together with psychological theories may contribute to the response to the stroke event and to the patient's participation in the rehabilitation process. The limitations of these theories will be discussed in the context of ideas that are to be investigated further in this thesis.

Figure 3



SEQUENTIAL MODEL OF PROPOSED INTER-RELATIONSHIPS BETWEEN VARIABLES IMPLICATED IN RECOVERY FROM STROKE

Chapter 4

Explanations of Health, Illness and Adjustment

According to the conventional "medical model", the natural course of stroke involves a phase of acute brain damage followed by a slower phase of recovery and re-adaptation which may be aided by rehabilitation therapy (Isaacs, 1992). Although the importance of "mental barriers" to recovery such as cognitive, perceptual or emotional disorders has long been recognised (Galski et al., 1993; Carter et al., 1988; Bernspang et al., 1987; Adams and Hurwitz, 1963), the possibility that progress may be hindered because patients' ideas about the stroke differ radically from the medical model, has rarely been considered.

This chapter aims to demonstrate how the patient is not a passive recipient of rehabilitation but has ideas and expectations which have an impact on outcome. Their knowledge may come from personal experience of their own health and illness but there may also be a contribution from the culture in which he or she lives. Lay theories about stroke and health beliefs form the cultural backcloth to the individual patient's beliefs and expectations about what might happen after the stroke and what might help. A sequential model (see Figure 3) was developed, based on current thinking, to demonstrate the possible inter-relationships of the different ideas and attitudes of the patient implicated in recovery from stroke. That is, to suggest how the stroke event itself and the extent of impairments, disabilities and handicaps, as reflected by the International Classification of Impairments, Disabilities and Handicaps, (Minaire, 1989) together with the patients' emotional reaction, to the stroke and its sequelae, may interact to determine patients' participation in rehabilitation. These factors together may result in what may be seen as a good or bad outcome by themselves or by others, in terms of psychological adjustment, recovery of physical function and social reintegration. The model suggests how pre-stroke factors (social and environmental, physical and psychological factors) may impinge upon the stroke event itself to determine the patient's experience. This model will be used to guide the information included in this chapter and to subsequently guide the development of hypotheses to be tested

4.1 Lay Theories

People have their own theories about health and illness, although health professionals may mistakenly think that lay health beliefs

> *"are at best watered down versions of proper professional medical knowledge (i.e. no more than "old wives tales"). People may in fact draw on a variety of accounts to make sense of what has, is or will happen."*
>
> (Stainton Rogers, 1991; p3)

The way that we make sense of anything at any one point in time has been suggested to be by accessing a number of simultaneously existing explanations (Stainton-Rogers, 1991). She proposes that for a particular event, people choose from a range of conflicting attitudes and that this choice depends upon; situational demands, mood and perceived importance at that moment. This implies that people would take different attitudes at different points in time. She portrays people as story tellers, who weave accounts in order to;

> "*create order out of chaos, and moment to moment make sense of their world amid the cacophony*".
>
> (Stainton Rogers, 1991; Page 10)

So they cannot be said to be telling it how it is always, but relaying how they are looking at it at that particular moment in time. Therefore, when trying to explain what it is that has made a person ill and what will enable them to recover, it is necessary to examine their own personal account at that point in time. Stainton-Rogers (1991, p13) has suggested that the Locus of Control construct (described in a later section) is inadequate to explain peoples' changing accounts and rejects the idea that biomedicine is "the only valid medical system" which is naturally superior and "mirrors reality without distortion". Further, Sedgewick (1982, p30) has suggested that all illness is in fact a matter of definition i.e.:

> "*The fracture of a septuagenarian's femur has, within the world of nature, no more significance than the snapping of an autumn leaf from its twig: the invasion of the human organism by cholera germs carries with it no more the stamp of "illness" than does the souring of milk by other forms of bacteria*"

Illness, is only that, in respect of what it means to the individual, the implications for a person not just an organism. That is, illness is socially defined. Berger and Luckmann (1966) felt that there are a number of explanations ("sub-universes of meaning") which compete with each other within society and within the individual. Biomedicine is only an explanation out of many differing ones, but it has been so strongly pushed forward as the right one that people find it difficult to disagree. Berger and Luckmann (1966), seem to suggest that this is somehow a plan to make laymen stay laymen and keep doctors as doctors. Even language has developed to bolster these ideas; "doctor knows best", "a little knowledge is a dangerous thing", so that these ideas are seen as "reality"

Robert Dingwall (1976) supported the idea of illness being socially constructed and argued that lay beliefs should be recognised as being functional within that context. That is, both illness and health should be seen as normality and consequently within a normal persons' control.

However, Ehrenreich (1978) says that we need to recognise that medicine is itself socially constructed, and not see it as a commercial or technical venture, so that we can tackle;

> "*the biological interdependency; with death, birth, pain; with care of the young, the sick, the disabled, and the aged*".

He feels that the problem is not that;

> "*... it generates dependency, but the kind of dependency it generates, and its social impact. We need a medical system which acknowledges our need for autonomous control over our bodies and which accepts our need for dependency.*"

That is, we need a system that allows people to be recognised as having their own ideas and opinions, their own ways of motivating themselves and a need to be allowed some choice and some control over their own bodies, treatments and futures which may or may not be directly in line with medical philosophies.

4.2 Psychological Perspectives

4.21 Health Beliefs

Each individual has their own beliefs, values and knowledge which relate to different illnesses and different aspects of health. That is, each person has their own perceptions of; the severity, seriousness and contractability of different diseases and disorders. Health beliefs are also thought to determine health behaviours; alteration of one's lifestyle in order to reduce the likelihood of contracting a particular illness or perhaps exacerbation of an existing problem.

A pessimistic view of behaviour, particularly if hoping to intervene in the adjustment of people to acute or chronic disorders, would be to assume that all behaviours are based on instinct. That is, responses to stimuli are somehow "wired in", inevitable and impossible to change.

However, it is a commonly held view that behaviour is amenable to change and that peoples responses are balanced against the potential consequences of behaving in a particular ways. That is, people are thought to make conscious or unconscious choices, about their resultant behaviour, based on past experience.

Thus, if an action has resulted in positive reinforcement in the past, then there will be repetition of that behaviour in the future. Conversely, punishment and negative consequences will make it less likely that that behaviour is repeated in the future (Seligman, 1975). Further, if no matter how one reacts, nothing good happens, then people become passive (with "Learned helplessness") and depressed.

This is obviously important, when endeavouring to recover from disabling conditions, where progress may appear slow or be so slow as to be imperceptible to the individual concerned. Should the person never gain any positive reinforcement from their rehabilitation efforts, they too may become passive and non participating. Should they blame themselves for their unfortunate circumstances, then this too could contribute to a downward spiral of ever increasing dependency and depression. It is therefore, imperative that we gain a clear understanding of how the feedback or response to individual patients is delivered in order that health care professionals do not contribute to the development of passivity. In order to understand this further it is necessary to explore the triggers (positive and negative consequences) to health behaviours.

The Health Belief Model (Becker, 1974) attempts to account for the determinants of health behaviours, with particular emphasis on behaviours aimed at preventing adverse outcomes, i.e. preventing and avoiding illness. That is, to identify what triggers particular strategies in certain situations. This idea of "cueing" could be useful in terms of suggesting how health care professionals could encourage individuals to change behaviour to ensure better outcomes. For example by using written or verbal information as cues. Though Becker (1974) suggests that people are frequently aware of effective health behaviour, no evidence is available to support these assertions. Others (e.g. Kemm and Close 1995) feel that people need an external cue to trigger these health behaviours. That is, something needs to make the individual become aware of the potential health, personal or social risks and results in appropriate behaviour change.

The triggering of health behaviours is thought to depend upon; the extent to which a person feels that they themselves are at risk of contracting a disease, how serious they view a particular disease, how beneficial they believe it would be to engage in certain preventative strategies and how much of an inconvenience or how painful taking a defined course of action might be. In other words the perceived; susceptibility, seriousness, benefits and barriers (Becker, 1974). In terms of stroke, this could be illustrated by;

- how susceptible a person feels to further stroke or psychological distress
- how likely they feel that the stroke will kill them (i.e. what will happen)

- how beneficial to quality of life it may be to keep in touch with personal finances
- the physical, psychological and environmental (e.g. finances) barriers to gaining what is seen as helpful

The Theory of Reasoned Action (Fishbein and Ajzen, 1975) describes the relationship between; beliefs, attitudes and behaviours. It is suggested that the best way to predict actual behaviours is to examine what people would intend to do in a given situation. However, the relationship between intention and actual behaviour is mediated by the value that an individual places on a particular outcome (their attitudes towards it) and how socially acceptable the person views a certain behaviour (important others views or expectations about the person's behaviour). Therefore, people are seen to take into account the opinions of others as well as their own motivation to achieve a desired goal.

Therefore, in order to change peoples' behaviour one has to first change their attitude towards this behaviour, and perhaps those of important others as well. This has implications for stroke rehabilitation or making use of patients expectations as one may first have to convince people of the positive health gains that could be achieved by changing ones behaviour e.g. that trying harder at rehabilitation will change outcome. But this does not take account of the persons' perceived mental barriers to achieving the desired outcome and the type of outcome one wishes to achieve.

These theories, to some extent, only reflect the intention or motivation to act and it is only where the action is under the conscious control of the individual that this could possibly affect outcome. That is, if a person decides to act or participate, and to some extent if they also have the co-operation of others. This may be of particular importance following stroke, when the person is particularly dependent on others for physiotherapy and other rehabilitation input.

The Theory of Planned Behaviour (Schifter and Ajzen, 1985) does take into account the individual's perception of behavioural controls and the barriers to achieving the desired outcomes, whether these outcomes are specific (e.g. lowering of plasma cholesterol levels) or general (e.g. being healthy). In recovery from stroke, the desired outcomes will vary between patients (as with other disorders) with some people having more general desired outcomes (e.g. having somewhere suitable to live) or more specific (e.g. being able to walk).

However, these perceptions may be determined by not only what is happening now but also on a person's past experiences and what they see as having resulted in them arriving at the current situation (e.g. what they feel caused the stroke).

4.22 Attribution

Attribution theory focuses on individuals' beliefs about what caused the things that have happened to them (causal beliefs). These are explained in terms of both specific and general explanations relating to; internality/externality, stability, globality, universality and/or controllability and determine many health related behaviours (Wright et al., 1990).

For example, Taylor (1982) in a study of breast cancer patients investigated different people's ideas about the origins or causes of their problem and their perceptions of control of the course of their illness. Taylor reported that though many people felt that the actual cause of the breast cancer was uncontrollable (i.e. that they could not have stopped the disease occurring by changing their lifestyle or something else) many felt that the future course was controllable. Furthermore, Taylor et al. (1984) found that 51% of these women who felt the course of the illness was controllable addressed the issues by developing a variety of coping strategies from altering their response to stress (e.g. not getting upset) to altering their lifestyle (e.g. taking it easy). They found that people's belief in having control was an independent predictor of adjustment (socio-economic status and prognosis were partialed out).

However, Lavery and Clarke (1996) when also looking at women with breast cancer, found that the 70% who had specific attributions about causality were no better adjusted than those in whom no causal attribution could be identified. Nevertheless, when women had made a causal attribution, controllability determined presence or absence of information seeking behaviour. Interestingly, it appeared that those who saw the cause of their illness as uncontrollable were more likely to exhibit information seeking behaviour.

However, Heider (1958) was insistent that his "phenomenological causality" was distinct from the cause and effect versions of scientific explanations. Heider (1958) suggested that people analyse what has happened to them in the past, relate that to predictive explanations about how things happen and subsequently those relating to what is likely to happen in the future. People then use these explanations to develop an appropriate (as perceived by them) response to whatever is happening.

Thus it has been suggested that there is some consistency in the way in which people react to or account for different situations and that this may be consistent throughout their life. That is, they may make psychological, physical or environmental causal explanations for common events or symptomatology.

As well as just relating to causal beliefs about specific events, attribution theory also goes some way to try to explain the dispositional aspects of causal and control beliefs. That is, there have been attempts to show that the way that individuals think about, account for and explain events and behaviours is to some extent consistent over time and consistent between situations. For example, it is thought that people who are particularly prone to depression are those who consistently attribute negative events to factors within themselves. This depression has been associated with internal stroke and global attribution style (Kaney & Bentall, 1989).

Turnquist et al. (1988) have suggested that certain types of attributions result in some people feeling more in control of situations and these feelings of control will then result in successful adjustment to illness and ultimately, to better recovery. Conversely, if people feel that they themselves are to blame for their illness, particularly if this is construed as due to some stable and global personality trait, then this will make adjustment and recovery less likely and adverse emotional reactions more likely.

Robbins and Kirmayer (1991) have suggested that peoples' experiences of illness lead them to develop algorithms (decision trees) which are used to help them to make sense of symptoms. That is, different individuals will account for symptoms in a variety of ways; physical, environmental and/or psychological. These algorithms would then be translated into and account for, health behaviours, health status and even immunological response to certain events or illnesses.

If these theories hold true, by identifying people's causal and control beliefs, perhaps by identifying **what they think will help** and **what they think will happen** to them, it may then be possible to address these issues on an individual basis with each person. Therapy could then address issues raised and perhaps alter adjustment and recovery.

4.23 Self Regard, Self-Esteem and Self Efficacy

The self concept is reflected by; Self-regard, self-esteem and self efficacy. Self-esteem can be viewed as the judgement of ones own worth, that is, approval or disapproval of ones self (Rosenberg, 1965). Wells and Marwell (1976) suggested that self-esteem is a combination of the evaluation of and feelings about (mood) ones self. If there is a discrepancy between what one sees as being the ideal self and the actual self, then this will affect ones self-esteem. This may also be compounded by these people not only perceiving themselves negatively but by actually being more sensitive to negative feedback. Thus a viscious circle may ensue.

Self-esteem is important generally, as those with high self-esteem, seeing themselves as worthwhile and important, will feel that they are able to influence desired outcomes and achieve set goals. Conversely, those with low self-esteem, seeing themselves as worthless and ineffectual, will feel unable to influence what happens to them and will fail to reach their desired goals.

Norris and Kunes-Connell (1988) suggested that there are 3 types of self-esteem; "basic" which is conceptualised as a stable core sense of self worth, "functional" which varies according to situations (rewards or failures) and "defensive" which protects people against situational threats.

Illness, whether chronic or acute, offers a challenge to ones self-esteem and feelings of self efficacy. Perceived self efficacy and inefficacy may influence response to recovery and rehabilitation, not just in physical terms, but in emotional and psychological areas as well. It is inevitable that these self perceptions are challenged by illness which may necessitate role modifications and other adjustments. Each individual needs to feel they are an active participant in, and in control of their own management and care.

Kearney and Fleisher (1979) have suggested that those with high self-esteem and feelings of self efficacy will feel they are worthwhile and that they are able to take the responsibility for decisions, whereas those with low self-esteem and self inefficacy may be unable to participate in the decision making process and feel unworthy of care.

Cohen (1959) suggested that the coping mechanisms of those with high and low self-esteem may be different. The former may use denial and ignore conflicting messages, whilst the latter may use more expressive and projective defence mechanisms. For example, people with low self-esteem before they have a stroke, may experience even greater threats to self-esteem after the event and may even view the reason for the stroke as being a result of their own failings.

Lazarus and Folkman (1984) feel that it is important to realise that people when questioned, may indicate high self-esteem and self-efficacy, but behave as if they have low self-esteem and feel ineffectual. Therefore, it is very important to distinguish between general beliefs and expectations and those that may become apparent in a specific situation or under certain circumstances. The former being a disposition carried to a particular situation by a person and the latter being a cognitive appraisal.

General beliefs about control have been reflected in the work of Wallston et al. (1976) on health behaviours, e.g. the work on Health Locus of Control which will be described later.

However, Lazarus and Folkman (1984) have suggested that these very restrictive definitions of supposedly general control expectancies, in fact renders them more along the lines of situational control appraisals. The latter depends upon the extent to which the individual believes that they can influence a particularly stressful situation. This relies to a great extent on that person's own coping resources as well as the demands required by that situation.

These situational control appraisals have been likened to Bandura's concept of self efficacy (Bandura, 1977), where a distinction is made between efficacy expectancies (the belief that one can perform the behaviour required to reach the desired goal) and the outcome expectancy (the belief that one's behaviour will actually result in the desired goal). Bandura (1977) states:-

> "*...individuals can believe that a particular course of action will produce certain outcomes, but if they entertain serious doubts about whether they can perform the necessary activities such information does not influence their behaviour.*" (p193).

Bandura suggests that efficacy expectancies are so important because they will determine whether a person will pursue their course of action, in order to achieve their desired outcomes, in the face of adversity. It is suggested that people choose their coping strategies in the light of efficacy expectancies and obstacles to successful outcome. Once the person becomes convinced that they will achieve their desired outcomes, then their perceived control increases, the situation becomes less threatening and the person feels that they can cope.

In many circumstances we know what we are capable of and what to expect. If asked we would be able to clearly explain our beliefs and accurately predict our future outcomes. However, in the first weeks following stroke, the person is unlikely to know what to expect under these new circumstances. They are generally inexperienced in stroke and may hold unrealistic ideas about what will happen and what is likely to help them to get better. If these unrealistic views are pessimistic and are then realised, the person may not even reach their full potential. Conversely, if they are optimistic, then perhaps they will achieve a higher level than others would have expected.

In dealing with health related problems, efficacy and outcome expectancies need to be determined and their relationship to outcome estimated. Furthermore, suitable interventions must be developed and evaluated in order to ensure the best possible chance of achieving a desired lifestyle. These outcome expectancies are often complex and it is therefore important to subdivide outcomes into specific sub-goals which can each be addressed in turn. These may relate to very practical issues such as environmental resources (e.g. the availability of mobility aids, somewhere suitable to live or having family and friends who will do shopping) or they may relate to emotional and psychological resources (e.g. feeling worthwhile, not being depressed or anxious and keeping calm).

It is vital to consider that these self-efficacy expectations are not stable characteristics, as this would make this theory useless in understanding how we may help stroke sufferers.

It has been suggested (Klein and Seligman, 1976; Seligman, 1975) that depression may alter the extent of change in efficacy and outcome expectancies in the face of adversity. Garber and Hollon (1980) found that depressives do not differ in their outcome expectancies for tasks requiring a skill, but they do differ in their perceptions of their own efficacy expectancies for that task. After positive reinforcement schedules, the amount of change in perceived efficacy expectancy was much less in those who were depressed.

Therefore, it would seem that health care professionals should understand how to enhance individual patient's self-esteem and feelings of self efficacy (i.e. empowering them) and should discuss desired outcome expectancies. In order to do this they will need to first of all assess the actual level of each person's self-esteem, perceived self efficacy together with mood, and then identify individualised goals and make a plan of how to achieve those goals.

4.24 Locus of Control

It is frequently suggested that stressful events, particularly illness or loss, result in psychological disorders, generally in the form of anxiety and/or depression. However, Ganellan and Blaney (1984) after reviewing the results of several studies which examined this issue, have commented that although statistically significant relationships have been found between life stress and the development of psychological disorders, the magnitude of correlations are small (0.2-0.3). They suggest that it is the immense heterogeneity of response to stress which waters down the results. Furthermore, if one examined individual differences and then related those to response to stress, the people who are more likely to suffer psychological disorders would become apparent. Locus of control is one of these individual difference variables which has been extensively examined.

Rotter (1966) suggests that individuals make estimates of their success in being able to control events that may happen in the future according to the way that they have been able to control past events. Also, that the likelihood of performing a behaviour depends, not only on that person's expectation that the behaviour would result in a successful outcome, but that the value that the person places on the outcome is very important as well. Rotter (1966) suggested originally that there were two dimensions to Locus of Control; "internality" and "externality". That is, the former would consider that they had something within themselves which would allow them to make a success of a certain situation, whereas the latter would consider that events were beyond their control and would put success or failure down to chance or luck. Other authors, for example Wallston et al. (1976), who examined the response of college students regarding generalised expectancies with regard to locus of control related to health, have suggested that a third dimension of "powerful others" should also be included, that is some people would see success being achieved in a certain situation because of others who are more knowing and in control and they would have to rely on and obey these powerful people (e.g. in the context of health and medicine, doctors or physiotherapists).

It is generally assumed that having an internal rather than external locus of control is adaptive and several studies (Cicirelli, 1980; Hunter et al., 1980; Palmore and Luikart, 1972) have suggested that adjustment to ageing is better in the former. However, it has been suggested that poor physical health in the elderly may be either as a result of, or may result in changes in perceived control over one's health, as it has been found that as an elderly person's health deteriorated, their externality increased (Brothen and Detzner, 1983). It is important to determine whether the relationship, between ill health and a more external locus of control, is the cause or the effect, in order to determine the best way to help people (including the elderly) to adjust to ageing and illness. If the change from internal to external locus of control is a result of perceived lack of control due to ill health, then stroke sufferers (and others with disabilities) may benefit from measures which increase perceptions of control.

However, as Wallston et al. (1976) have suggested, when giving the rationale for the development of the Health Locus of Control (HLC) scale, that when individuals gain increasing experience in a particular situation, then this will result in different and specific expectancies. These specific expectancies will contribute more than their "generalised expectancies" to psychological well-being and it may be more useful in the prediction of outcome behaviour after stroke (or other specific situations) to develop a more specific expectancy measure. Wallston et al. (1976) demonstrated the discriminant validity of their HLC when compared to Rotter's (1966) Internal-External Locus of Control (I-E) scale. Those subjects with high HLC scores (high internality) sought more information about their illness and were more satisfied with weight loss programmes, though this effect would not have been detected if the original I-E scale was used (Wallston et al., 1976).

The relationship between specific expectancies and predictions of outcome is complex and some studies have shown conflicting results. It is likely that the I-E/powerful others concepts (developed as "generalised expectancies") may not be adequate to predict outcome in those who have had either a first or recurrent stroke or in those with other factors contributing to levels of disability and comorbidity (i.e. those with a heterogeneity of "specific expectancies"). It may be that a range of psychological strategies are required to adjust to something which can cause such diverse problems, such as a stroke.

Furthermore, health locus of control theories assume that people are consistent in their attributions across situations, however, this may be maladaptive, as someone with an internal locus of control, who has a severe stroke, may strive to improve, fail and blame themselves for that failure. This could result in psychological morbidity and undermine adjustment.

But are people just mere pawns of social conditioning or are they purposive thinkers who strive to make sense of the world and bring to it their own sophisticated models of the world which are used to interpret and construct their own version of social reality? It would be preferable, and would seem more sensible, if people faced with a demanding situation were to contemplate the interaction of different variables, test out a variety of hypotheses, recognise their own abilities, disabilities and mental and social resources and thus to arrive at a solution for the best way to proceed. That is, it would be preferable to be a social interactionist.

This would also suggest that they would possibly be able to take on board the ideas of others, that is to be swayed to take a particular course of action. In adjusting to the increased demands due to having had a stroke, this would allow the person's own insight into the situation to be combined (as deemed appropriate by the person themselves) with the ideas of experienced health care professionals in order to cope with the situation at hand.

It would be desirable for changes in the types of demands over time and situation, to be able to be re-appraised and a new way forward planned as and when necessary. In this way, the person could develop coping strategies suitable for every situation that is presented to them.

4.25 Coping

Coping is about dealing with coping tasks, that is those that threaten physical or mental integrity (e.g. everyday hassles, bereavement or illness such as stroke). Coping strategies are performed in order to alleviate feelings of; fear, anxiety, guilt and distress and can encompass both cognitive and behavioural strategies.

Coping is stimulated in patients with acute and chronic health problems in order to deal with the demands of their illness. Coping can involve either; "approach", i.e. confrontation with reality, adaptation and participation in decision making or "avoidance", i.e. denial, minimisation and ignoring of problems. Patients and their families need to respond to the requirements of the external situation and the patients need to respond to and confront their own feelings about the situation. Each family and each individual will respond to the situation differently, that is they will have their own "coping style" (Lipowski, 1970) and successful coping would be indicated by adjustment and well-being.

Coping can also be viewed as directed at the environment or the self, and can thus be viewed as either; problem-focused, where the individual develops a strategy to deal with the stressful problem (e.g. changing one's lifestyle) or emotion-focused, where the individual develops a strategy to deal with the distressing emotional response to the stressor (e.g. trying to think positively). Lazarus and Folkman (1984) have suggested that the most useful coping strategy to adopt depends on whether the situation is viewed as being controllable or uncontrollable, with problem-focused strategies better for the former and emotion-focused for the latter.

It is well known that implementation of certain coping strategies can moderate the psychological impact of illness (Johnson et al., 1989) and different strategies may be more appropriate at different stages of the disease. For example, in the acute stages of stroke where the situation may be viewed as uncontrollable, emotion-focused coping may be more effective. However, later on in the rehabilitation phase where the situation may be viewed as more controllable, then problem-focused strategies are likely to be more effective. If more appropriate coping strategies are adopted, then it is likely that adjustment to the illness will be successful and consequently, outcome will be improved (Freidman et al., 1990; Dean and Surtees, 1989).

Coping is viewed in a variety of ways by different psychologists. For some, coping is viewed; as a stable, personality based emotional and behavioural mode of responding; for others, as learning to escape or avoid conflict (Roth and Cohen, 1986) and others, as a physiological response of activation of the pituitary and adrenocortical system. Lazarus and Folkman (1984) view coping as context specific behavioural and emotional processes in which an individual encounters, appraises and recovers from a situation and this could be from any minor problem to a major life event. Alternatively, coping could be viewed as dealing with social and environmental demands or as problem solving, that is, developing a strategy to address the problem whilst still carrying on with normal activities (Mechanic, 1995).

Lazarus and Folkman (1984) have suggested that coping has 2 levels; primary and secondary appraisals. The primary appraisal involves the person deciding whether the situation is a threat and thence the secondary appraisal involves them deciding on the range of options for any action perceived as necessary. The response can be; emotional, cognitive or physical.

People may learn that certain strategies in certain situations are successful and should such a situation arise again a similar strategy would be employed. Garland and

Bush (1982) have termed this "mastery". The person may not completely avert a particular situation which develops but may come to realise that they can actually get through the situation without any particularly lasting adverse consequences. This Garland and Bush termed "resilience" and this would be classed as successful coping. Conversely, if the strategy employed did not result in the desired outcome and this resulted in a negative outcome (e.g. anxiety, fear or distress) then this would be viewed as ineffective coping. The continuance of ineffective coping can result in a crisis situation developing and may require professional intervention.

Different people have categorised coping strategies in different ways. For example, as described previously, Lazarus and Folkman (1984) have defined coping as being either emotion or problem focused. The former comes into play when the individual has decided that the oncoming threat is unavoidable and employs strategies of; avoidance, minimisation and selective attention. That is, they try ways to distract themselves from the problem. The latter (problem focused) is brought into play when the oncoming threat is seen as possible to avert. The person focuses on the problem and develops a strategy to deal with it. For example, for someone who has suffered a stroke, has developed arm weakness and is no longer able to dress themselves in the conventional manner, then the person develops an alternative method of dressing.

Coping is viewed as effective when the behaviour employed to deal with the threatening situation, successfully sorts it out. Visotsky et al. (1961) viewed coping as being effective when; distress was maintained to within manageable limits, the person continued to be hopeful, the person continued to have feelings of self worth, that they could maintain relationships with friends and family, physical recovery was promoted and the whole environmental and social situation was stable and successful.

Thus as Folkman and Lazarus (1984) have suggested, coping is the management of either internal and/or external demands by evolving cognitive and behavioural strategies. Weisman (1979) suggests that the individual is motivated to cope effectively by the ensuing rewards (e.g. return to normal and relief of anxiety). Coping strategies must be flexible and change depending upon the situation, that is coping strategies are themselves neither "good" or "bad", but only "effective" or "ineffective" according to the whole situation. The most successful copers are those who have a large repertoire of strategies so that they can select the most appropriate stance for a given situation (Roth and Cohen, 1986). For example, in the early stages of stroke, avoidance strategies (e.g. denial) may be the most appropriate as the threat is unavoidable and unchangeable. However, later in the rehabilitation phase, approach strategies may be more effective where alternative methods of performing tasks must be developed along with alternative ways of viewing roles and goals. The patient would then actively and energetically address their own recovery and engage in the rehabilitation process.

When looking at response to illness specifically, Lipowski (1970) suggests that coping is the attempt by the person to preserve their integrity (physical and mental) and to optimise their functional recovery and minimise handicap. Several studies have demonstrated improved physical and emotional outcomes for patients in whom care was delivered in a manner appropriate to their particular coping styles (Miller and Mangan, 1983; Shanan et al., 1976; Cohen and Lazarus, 1973). It is essential that staff assess patients thoroughly, identifying their coping strategies and tailoring care to make the most of each person's existing resources.

4.26 Optimism and Motivation

Shifren (1996) examined individual differences in the perception of optimism and disease severity in those with Parkinson's disease and in particular focused on the relationship between optimism and perceived disease severity. She found that although individuals showed lability of optimism over a period of 2 months, around 67% showed no pervasive negative changes in optimism in this period. Those who were more optimistic reported less need for assistance with basic functional abilities than those who were less optimistic.

Dispositional optimism, which has been described as a generalised expectancy for positive outcomes by Scheier and Carver (1985), has been shown to be related to quicker recovery from bypass surgery (Scheier et al., 1989) and myocardial infarction (Desharnais et al., 1990). In the former, Dispositional optimism was positively related to better health and those who were optimistic recovered more quickly and returned more quickly to a normal lifestyle and needed less assistance. In the latter, despite the difficulties of living with chronic illness, the optimistic adapted better to their illness and were more likely to maintain an enhanced quality of life (Wood et al., 1985).

Consequently, the part psychological characteristics play in enhancing health among individuals with chronic illness and how negative affect may influence the relationship between optimism and self-reports of symptoms is now being increasingly recognised (Tennen et al., 1992). Although, optimism may explain the variance in perception of symptoms beyond the contribution of negative affect.

Individuals adjust differently to chronic illness (Zautra et al., 1994) and it is felt that this may be due to premorbid personality characteristics (Menza et al., 1993). Adjustment to chronic illness may be determined by the size of the discrepancy between behaviours and the reference value (that is reference value = healthy person, behaviour = ill person) particularly when the disease or disorder is first diagnosed. As the disease progresses the reference value should change (Charmaz, 1991) and if the reference value fails to change over time, there may be a large discrepancy between outward behaviours and reference values which will leave individuals unable to effectively manage the symptoms of their disease.

However, Hooker (1991) has stressed that the assessment of personality like characteristics, at one or two time points, does not allow for the emergence or display of lability in psychological processes. It is probably this very flexibility in optimism among individuals with chronic illness that allows them to adapt to the unpredictable symptoms that occur from day to day in a number of chronic diseases (Charmaz, 1991, Clark et al., 1991).

In terms of treatment, positive framing strategies have been found by Dakof and Mendelsohn (1989), which allow those patients with Parkinson's disease to put negative thoughts from their mind and make them believe that things could be worse, thereby feeling that things were not so dreadful after all. These findings were confirmed by Marr (1991) who also found that thinking positively aided adjustment in Parkinson's disease as well as increasing self-esteem.

Adjustment to chronic illness is vital but difficult as chronic illness permeates every aspect of peoples' lives (Livneh and Antonak, 1994). Rush Michael (1996) in his qualitative study examined how people integrate chronic illness into their lives. Colaizzi's (1978) method of data analysis revealed four major themes; confronting loss, fluctuating emotions, making changes and gaining control over an altered life direction. Talking to people at length is useful not just in the context of research and, as Sandelowski (1994) has suggested that it is when health care professionals actually listen to a patient's stories and show that they are interested in them as individuals that it makes patients feel that they are important.

When being interviewed a person with diabetes stated;

> "*Many people think diabetes is just a disease, but it's not. It's much more than that. A disease is something that happens to your body. Diabetes affects every aspect of your whole life. It's more than a medical problem, it takes over your mind too. It's more than just a simple adjustment of medicine and nutrition, it requires a complete retraining of your lifestyle. Nothing is spared, no part of your life is left unscathed*".
>
> (Rush Michael, 1996; Page 2)

This is why it is important when trying to gain an insight into how patients view the future and how it will affect their lives, that every possible aspect of their lives, as they see it, is included in any questionnaire that is developed.

4.3 Rationale for this Study

As previously stated, although the importance of "mental barriers" to recovery has long been recognised, the possibility that progress may be hindered because patients' ideas about the stroke differ radically from the medical model, has rarely been considered.

The possibility that such clashes may be due to fundamental differences in outlook is supported by a study carried out by Bar-On (1986), who examined the beliefs and attitudes of coronary patients and staff, using the "Q-Sort" technique. Subjects were asked about why they thought they had had their heart attack and what would help them cope with it. Their ideas often differed markedly from the conventional medical view, yet staff appeared unaware of the discrepancies. Some of the themes reported by Bar-On's patients were: "fate and luck" (e.g. "God will Help me" or "I'm just unlucky") and "control of the future" (e.g. "I will take life easier" or "I will stop smoking"). These themes were used to formulate a representative set of statements, which were then sorted - the "Q-sort" - by the subjects into those that they agreed or disagreed with and those that were irrelevant to them. A cluster analysis was performed to show the different patterns of beliefs and expectations.

Stroke patients are generally much older than Bar-On's subjects and are likely to see their situation quite differently. Denial of disability is common and patients' expectations are often labelled as "unrealistic". In many cases this may be due to cognitive damage, but our preliminary work in this department (unpublished data) indicates that some patients' basic beliefs and expectations about what might help them get better differ markedly from those of professional staff.

Attitudes of patients and their relatives may also differ. Patients seem mainly interested in physical recovery whereas relatives tend to value social and emotional factors more highly (Wade and Hewer, 1985). Anecdotally, patients and relatives initial expectations of recovery are often high, with denial by the patient that disability will be permanent. In the face of the reality of continuing disability this psychological defence mechanism which may have served the useful purpose of reducing stress in the early stages, may contribute to the high risk of depression and anxiety in the later stages after stroke (House et al., 1987; Wade and Hewer, 1985) and lead to increased strain and psychological distress in carers. Depression may in turn inhibit functional recovery (Starkstein and Robinson, 1988; House et al., 1987), delay discharge and cause more distress to patients and their relatives.

The proposed qualitative study described in the next chapter aims to investigate, in a structured way, patients' and carers' ideas about the likely future course of their stroke ("beliefs") and the factors expected to help recovery ("expectations"). This information should help to clarify ways to help patients and families come to terms with the stroke as well as maximising functional recovery.

Chapter 5

Beliefs and Expectations (Qualitative Study)

5.1 Background

In Chapter 3 it was shown that there was a statistically significant relationship between physiotherapist's predictions and actual outcome for survivors of stroke. It is likely that therapists base these predictions on a wide variety of data from different sources. That is, from their own life and work experiences; knowledge about the type and severity of the patient's stroke in the context of the patient's previous medical and social history; the patient's (and possibly their own) personality and attitudes.

From clinical experience we know that initially patients have high expectations about the extent to which they will recover after stroke and a tendency to ignore the possibility that disability could be permanent. This suggests that they may be using the psychological defence of denial to protect themselves from the negative emotional impact of a gloomy outcome. Failure of this defence mechanism in the face of the reality of their situation may contribute to the high risk of depression and anxiety after stroke (Wade and Hewer, 1985; House et al., 1987) and lead to increased strain and psychological distress in carers and inhibit functional recovery (House et al., 1987; Ebrahim et al., 1987; Starkstein and Robinson, 1988), delay discharge and cause more distress to patients and their relatives.

If we could discover the underlying ideas, beliefs and assumptions patients have about their recovery, then these could be identified at an early stage and interventions instituted, to try to change their thinking style and maximise their recovery. Stroke sufferers may then be helped to achieve the best possible functional and emotional recovery, to come to terms with their disabilities and to return to as normal a lifestyle as possible.

Unfortunately, a questionnaire to identify patients' ideas does not currently exist and it was therefore decided that the development of such a questionnaire would make a valuable contribution to our knowledge of stroke and patients' reactions and responses to the stroke.

In order to develop a questionnaire to examine patients' ideas, it is important that the items included should reflect patients' own ideas and not those of health care professionals. The proposed study therefore aimed to investigate, by structured interviews with patients, their ideas about the likely future course of their stroke (expectations about **what will happen**) and the factors expected to help recovery (beliefs about **what will help**). The themes identified from the content analysis of transcribed interviews were then used to develop a questionnaire.

As a strategy to assist in the discussion of **what will help** and **what will happen,** patient's social roles were discussed with them. Social roles have been described and categorised in a variety of ways. For example, how other people see you and who you feel you are to them (role perception) and the sort of things that you generally do with your life (role enactment) and how you help or interact with other people in their lives (Moreno, 1962). Role is viewed as the *"dynamic aspect of status"* where status is seen as *"a collection of rights and duties"* and contribute to social structure in the form of networks, positions and expectations. Furthermore, Clifford (1996) suggests that each individual's behaviour could be viewed as *"role performance"* which would link individuals' behaviour and social structure.

As discussed in the previous chapter, people are more than just mere pawns of social conditioning, they are purposive thinkers, striving to make sense of the world. In order to examine people's reactions to having a stroke and their perceptions of the future, a phenomenological approach must be adopted which respects hermaneutics and examines both social interactionist and reactionist perspectives.

This study aims to examine the suggestion of Sartre (1969) that man

"can always make something out of what is made of him"

This acknowledges that people are inevitabley influenced by their social situations, but are never totally restricted to react in a way that is expected of them, and that people can make something out of any situation. This may be dependent upon the beliefs and expectations that they develop in reaction to a stroke, which may guide their future behaviours.

The following describes the design and methodology of a qualitative pilot study performed to examine these beliefs and expectations.

5.2 Methods

5.21 Subjects and Sampling

Seventeen patients who had been admitted to the Royal Liverpool University Hospital with an acute stroke were included in the study. The researcher aimed to identify, through ward staff, people who would be able to participate in an interview. Purposive sampling was used to include people from a wide variety of social backgrounds, of varying ages and those from ethnic minority groups. Some were to have previous experience of disability either personally, having had either a previous stroke or other disabling illness, orindirectly through the experience of other friends or relatives. At the time of their interview some patients were to have only been in hospital a few days and others were to have been in hospital for several weeks or months.

5.22 Interviews

Face to face semi-structured interviews, (based on patient's social roles - see Appendix 2) where a free flow of information was encouraged without forced replies or biased responses, were undertaken to establish basic themes and to obtain as broad a range of ideas or opinions as possible. All interviews were performed in a quiet place on the ward where as much privacy as possible was ensured.. The researcher, after gaining informed consent, endeavoured to make the interviewee as physically comfortable as possible, adjusting their seating and pillows where necessary and explaining that they should feel free to cut short the interview at any time should they wish, or if they were feeling tired or uncomfortable. The use of the tape recorder was explained and assurance was given that once the interviews had been transcribed verbatim, that the tapes themselves would be wiped clean and the information that was contained would be kept confidential and only used anonymously for the agreed purpose. The tape recorder was positioned so that it would appear as unobtrusive as possible, but in such a way as to ensure a clear recording of the interview. At the start of the interview, some general questions were asked by way of introduction and to assist in the devlopment of some rapport between rsearcher and interviewee. If the interviewer was asked for specific information, especially if it related to expectations of recovery from stroke,during the course of the interview, the interviewer suggested to the patient that these points could be discussed at the end of the interview. The interviewer took note of the issues raised and then made every effort to answer any questions raised once the interview was finished.

All interviews were conducted by the researcher and continued until both the participant and the researcher felt that everything had been said. Consequently, some interviews lasted only 20 minutes and others, several hours. All were tape recorded and later transcribed in full. It was hoped that the main themes surrounding the questions "what do you believe will happen over the next few months?" and "what do you expect might help you?" would be elicited. Successful communication was encouraged by asking open ended questions and further probing to ensure answers were complete and eye contact was maintained where approariate. The researcher used other non verbal cues to encourage the interviewee to talk, for example leaning forward, nodding, echoing and reflecting back.

5.23 Analysis of the qualitative data

Content analysis was then performed on the transcription of each of the 17 interviews (a sample from 5 can be found in Appendix 3). Each transcription was read through in order to gain a sense of the whole of the interaction between the researcher and interviewee, and to allow the determination of the meanings for each statement in context. Each phrase or sentence containing a relevant concept was delineated and identified as a unit. Statements were identified which were significant to the patients' experience of integrating stroke illness into their lives and reflected possible answers to the two questions; **"what do you believe will happen?" and "what do you believe will help?".**

Each statement was then rated as relevant or irrelevant to the topic in question (i.e. whether it could be an answer to the **help** or to the **happen** question).

A page was randomly selected from each of 5 interviews (which had also been randomly selected from the pool of 17). Each had previously been divided into statements by the investigator (Rater 1) and rated as relevant or irrelevant. A second researcher (Rater 2) then rated each unit independently as to its relevance or irrelvance. Inter-rater reliability (IRR) was performed to ensure that relevant statements had been examined. The IRR was determined using Cohen's kappa (Cohen, 1960) which is a measure of agreement and has been defined as:

> *"the difference between the observed proportion of cases in which the raters agree and that expected by chance...it normalises the difference by dividing it by the maximum difference possible for the marginal totals".*
>
> (SPSS Manual, 1993, p 215).

The kappa statistic is therefore used to measure the agreement between two raters. As suggested by Brennan and Silman (1992) the different levels of the Kappa statistic were interpreted using the descriptors as shown in Table 9 below.

Table 9 Suggested interpretation of agreement for different values of the Kappa statistic.

Kappa Values	Strength of Agreement
< 0.21	POOR
0.21-0.40	FAIR
0.41-0.60	MODERATE
0.61-0.80	GOOD
0.81-1.00	VERY GOOD

5.24 Selection of Questionnaire Items

Relevant statements (as determined by Rater 1) and their meanings were then organised by the researcher into broad themes and sub-themes. A theme was defined as a core concept and a sub-theme as a dimension of that concept. For example, the theme *"coping"* was identified as a core psychological concept and was represented by the sub-themes of ; *problem solving, emotional discharge, avoidance/denial and acceptance.* Each of these sub-themes is recognised in the coping literature as a type of coping behaviour, though these are not the only coping behaviours that have previously been reported.

A statement from the total item pool was then identified to represent each sub-theme that had been identified in the content analysis. Statements were selected that did not contain jargon and colloquialisms and were not too complex, that is, each statement had to be intelligible to most people. The ease with which statements could be read was checked and the method is described in the next chapter. An evalaution of how much the statements were thought by health care professionals to reflect each sub-theme and consequently each theme is also described in the next chapter. Following this evaluation, the qualitative data was reviewed a second time and further themes and sub-themes were identified.

Table 10 Subjects Interviewed to obtain Qualitative data

Initials	Age	Sex	Ethnic Origin	Marital status	Children	Employment	Pre stroke Rankin (non stroke problems)	Previous stroke	Other Knowledge of stroke	Sided weakness	Week Post Stroke	Current Barthel	Ward Type
PQ	45	M	White Irish	Single	None	Labourer	0	None	None	Right	13	20	Home
GB	61	M	White	Divorced	2 Fs:1 M	Factory worker	3 Amputee Right leg & Reg'd blind	None	None	Left	4	9	Rehab
LC	62	F	White	Married	1 M	Pharmacy Assistant	1	Yes (x3)	Mother had fatal stroke and Sister had non fatal stroke	Left	12	13	Rehab
DA	67	F	White	Single	None	School Teacher	2	Yes (x1)	None	Right	3	10	Rehab
NS	69	F	White	Widow	2 M	Housewife	0	None	Husband was a nurse and related tales of strokes	Right	3	9	Acute
EA	71	M	White	Single	None	Bus Driver	0	None	Sister had 2 strokes (1 mild and 1 fatal)	Left	6	4	Acute
VB	72	F	White	Widow	2 M	Housewife	0	None	Friend had a very mild stroke	Left	4	11	Rehab
PM	72	M	White	Married	1 F:1 M	Bus driver	1 RTA resulted in Left leg shorter	Yes (x3)	None	Right	5	3	Rehab
EU	73	M	Black Afro-Caribbean	Divorced	4 M	Night Club Bouncer	1	Yes (x1)	Fellow patient with stroke died last admission	Right	7	15	Acute
NJ	73	M	White Irish	Divorced	3 F:4 M	Civil Servant	1 Emphysema	None	Mother was very dependent but recovered after a stroke	Left	3	15	Acute
JH	73	M	White	Married	1 F	Engineer	5	Yes (x3)	Friend had 9 strokes and is in a nursing Home	Right	3	12	Home
MM	75	F	White	Married	2 F	Housewife	0	None	Daughter a nurse	Left	10	8	Rehab
RC	77	F	White	Widow	2 F	Unknown	4	Yes (x1)	None	Left	3	11	Acute
SR	81	F	White	Single	None	Secretary	2	Yes (x1)	None	Right	3	12	Acute
HB	84	F	White	Widow	1F:1 M	Unknown	2 Frail faller	None	Unknown	Right	4	8	Rehab
JO	84	M	White Irish	Widower	4 F:4 M	Dock Labourer	0	None	Wife was dependent with a severe stroke & later died	Right	5	5	Rehab
ER	86	F	White	Widow	1 F	Housewife	0	None	None	Left	2	10	Rehab

5.3 Results

5.31 Subjects and Demographic details

The median age of the sample was 73 (IQR 67-81) years and 9 (53%) were female. Of the 17 subjects, 7 (41%) had had at least one previous stroke and 8 (47%) had had a left hemiplegia/hemiparesis. The median Barthel score was 10 (IQR 8-12.5) and the median time since stroke 4 weeks (IQR 3-6.5). A summary of patient characteristics can be seen in Table 10 opposite.

5.32 Content Analysis

5.32(1) IRR of whether Relevant or Irrelevant

In the 5 pages of text analysed a total of 167 statements were identified. The comparison of Rater 1 and Rater 2 are shown in Table 11 below.

Table 11 Comparison between Rater 1 and Rater 2 on relevance or irrelevance of statements to the Help and Happen aspects of recovery.

	Rater 2		
Rater 1	Relevant	Irrelevant	Total
Relevant	43	42	85
Irrelevant	11	71	82
Total	54	113	167

Rater 1 tended to include more statements as relevant than Rater 2. Agreement was found to be fair (Absolute agreement of 68%, Kappa = 0.37)

5.32(2) Themes and Sub themes Identified

The broad themes and sub-themes identified initially (the first 8 themes and 32 sub-themes) and later (the last 3 themes and corresponding 12 sub-themes) are shown in Appendix 4. Themes can be seen in column 1, sub-themes in column 2 and statements to represent each sub-theme in column 3 of Appendix 4.

The nature of the ideas represented in each of the themes and sub-themes will be further elucidated by recourse to further examples from the transcribed texts.

Broad Ideas About The Future

Several subjects stated that they did not know what would happen to them or what would help them to get better or whether their lives would even change as a result of the stroke. Nevertheless, when encouraged to talk freely, it appeared that many had some ideas of their own. Though some said *"it is certainly going to change my life"*, others that they would *"have to wait and see"*. Some people questioned the researcher to try to obtain some indication of what they might expect. Some asked in broad terms *"it can't be the same can it?"* and others asked specific questions about whether they would ever walk again or return to their own home.

Likelihood of Recovery or Deterioration

Some subjects made predictions about the percentage of recovery that they were or were not expecting. For example, one of the younger men said that he was *"hoping to be 50% better"*, an elderly lady said that she thought that she would not *"get 100% better"* and others were a little more cautious suggesting *"a little bit better"*. Others were convinced that there *was "more potential left"* in them, even if not sure how much.

Some conceded that death was very likely or a distinct possibility particularly if they had another stroke. One man described his awareness:

> *"I have a sense of death in here it makes you feel worse. I'll feel better when I'm at home away from this. It makes you feel worse, I see death - but I keep that to myself".*

Motivation

Motivation was identified by many as being positively correlated with recovery and was a recurring theme for nearly all of the patients, though some were more optimistic than others. Several people expressed motivation directly as planning, trying and determination and others more indirectly as perceived control. Some subjects talked about actual plans that they had made: For example, *"I'm going to be able to go to my sons for Christmas"*. Others felt that it was not helpful to make plans at all and said *"It's no use making any plans"* and suggested that they *".. never look forward too far"*. For some it was evident that they were aware that they had changed their outlook since suffering the stroke. For example, a younger man said *"I used to think about the future, but now I just take every day as it comes"*. The majority of people interviewed felt it was important to try, saying *"I just said to myself I have to get on with this..and I've been trying"*. Those who felt determination to be essential, expressed this in an enthusiastic way as if trying to demonstrate a very positive frame of mind. For example, *"I'm determined to get better now!"*, where the word *"now"* was really stressed. Another demonstrated the long term requirement for determination by asserting that *"No matter how long it takes, I'll get back to my own home, I'm determined"*. Perceived control was suggested more indirectly. For example, one subject said that they were *"... used to relying on myself"* and *"No matter what happens I will get through it, I always have done and always will"*.

Coping

Coping strategies were demonstrated in a variety of ways and were inferred from the transcriptions by the researcher, but the stroke sufferers themselves did not identify coping strategies directly. For example, problem focused coping, was expressed by the stroke sufferer as *"..just doing what has to be done, one step at a time"*. One stroke sufferer suggested that they thought it helpful to *"Let emotions out"*, though other people said the opposite. For example, one of the ladies suggested that *"..you shouldn't cry... you have to put a brave face on and bottle it up"*. This was particularly poignant as whilst stating this she had actually started to cry and apologised for doing so. Several of those interviewed felt that bottling things up and hiding true feelings was particularly important, not always in the context of helping themselves as such, but in order to protect their families from further upset. However, it was not just the conscious strategy of hiding feelings that was expressed but the recognition that they had hoped that people would *"just not confirm that.."* they had *"had a stroke"*. Some people had developed, if unconsciously, coping strategies where they denied to themselves that they may never recover completely: *"I'm going to get back home very soon"*. When it was quite obvious to outsiders that they had had a severe stroke several weeks ago and had thus far made little recovery. Others did not deny to themselves that they had had a severe stroke but insisted that they *"..couldn't care less what will happen"* and were denying that they had any feelings or anxieties about the future. Some people had more or less given up hope of further recovery and felt that is was important to *"...just accept the way things are"*. This person's attitudes to his or her future had been encouraged by a misunderstanding of the information contained in a leaflet which was supposed to clarify what to expect in terms of recovery. However, they had mistakenly adopted the idea that further recovery is not possible after three months after the stroke.

Self-Esteem

Having high self-esteem was recognised by most subjects as being important. Several people felt that accepting their own personality, identity and body were essential. That is, stating that it was important to be *"...happy with just being myself"* and to *"..accepting my body and the way that I look"*. Several subjects demonstrate self-efficacy and confidence by expressing the idea that they *"...can do most things that"* they set their *"mind to"* and that they were *"..still a worthwhile person"* despite their disabilities.

In some cases it was apparent that the person's self esteem had already taken a severe blow saying *"my family come to see me...they see me as a different person now...I am not the same person now...there can be nothing worse than this"*. Others felt their dignity had been lost because of their dependence *"they have to ferry us to the toilet...not pleasant for them...not pleasant for us, we lose our privacy".*

Others had an altered body image, viewing limbs with weakness as being *"dead...well..its almost dead", "..its horrible to look at someone whose face has dropped...I dribble like a baby even now"*, or commenting on their appearance with disdain *"like a jelly woman....I just wobbled and flopped to one side".*

Mood/Affect

Many subjects described their own emotional response to the stroke and explained how they felt that they should feel and act. The old adage *"..just keeping cheerful"*, hopeful and *"keeping your pecker up"* were mentioned repeatedly. There was also recognition that trying to reduce feelings of stress was important and that it was best keep anxiety at bay. That is, to *"try not to worry or get tense about things"*.

One man was clearly suffering form low mood *"I'm not sure what the worst thing is..I have no life now..I can't work...nothing can be worse than this...I have to look ahead to not being able to do anything"*. The researcher reflected back *"you feel helpless?"* and he replied quickly and firmly *"Hopeless!"*

Fate

Though the majority of people focused on many practical issues, the role of fate and divine intervention were not ruled out. One man said the *"only God knows what is gonna happen to me"*. Many felt that *"whatever is meant to be will be"* and some included that they were just *"putting"* themselves *"into God's hands"*. The inevitability of death was also stated, recognising that *"there's one thing in life that we're sure of"* and that *"we all have to die of something sometime"* and others suggested they would even be *"better off dead...this is a bad sickness"*.

Treatment

Both conventional and alternative treatments and therapies were identified by the majority as having a role to play in peoples' recovery. Medical care and *"a certain type of drugs"* were mentioned by some, but physiotherapy was identified by all but one as being particularly important both whilst in hospital and for later when *"they are going to bring me here from home especially for physio"*. The one lady who was unsure about the efficacy of physiotherapy felt it important because her husband was convinced that it would help her to recover. Most subjects felt that the therapy they had received was insufficient and several suggested that they *"need more physio"* and certainly *"more than half an hour each day"*. Only two of the subjects mentioned occupational or speech therapy, even though most had had the former and at least a third the latter. The efficacy of alternative therapies was not ruled out with one lady mentioning that she was *"...looking forward to the Nursing Home now because....they have an aromatherapist"*.

Function (Basic, Instrumental and Cognitive Activities of Daily Living)

Patients' expectations of recovery were often high and many felt that *"life's not worth living without your independence"* and thus it would be important to be able to perform basic (e.g. walking and personal hygiene) instrumental (e.g. use of the washing machine and the telephone) and cognitive (e.g. decisions) activities of daily living. For example, one man stated *"I would like to walk very much"* and to *"be able to get about more"* and others were more concerned with being able to control their bodily functions: *"as long as my water works are all right"* or *"I wouldn't want to be a smelly old woman"*

Others were also concerned with being able to resume responsibilities within their partnership: *"the wife's been paying all the bills of late and that's my job....I'm gonna get back to looking after things"*. Many expressed concern about their status within the family as a giver of advice, feeling that their children would no longer *"..see the old bugger as any use when it comes to deciding about getting a new house or a loan from the bank"* and that they themselves would want to be *"..capable of making ...decisions"*.

Behaviour

Though it has been suggested that people do not resume leisure activities after their stroke even when their physical impairments are minimal, it would seem that these subjects recognised that *"getting out and about with...friends"*, and getting back to their gardening, needlework or other hobbies was particularly important. Many recognised that they may require some help from the family in order to socialise. For example one man said that now *"they will come and take me out in the car"*, whereas in the past he *"used to go out...used to work in a night club...maybe I can get there when I'm better"*.

The majority of this sample were past retirement age and those who were younger were unemployed previously or restricted in their employment activities because of pre-existing disability.

Though the identification of what the person felt had caused their stroke (causal attributions) was not the prime aim of this particular study, it was frequently discussed as a way of exploring what might be done in the future to prevent a recurrence. Several people identified *"booze"*, *"chips"* and *"smoking for years"* as causal and recognised that giving up these bad habits may improve their health and life expectancy in the future. However, there were others who felt that it was pointless altering their lifestyle now; accepting (possibly wrongly) that the next stroke would kill them and stressing that they *"wouldn't want to survive another one that's for certain"*.

A further 3 themes and their sub-themes were identified following discussion with a Clinical Psychologist and review of the initial analysis of the questionnaire items as viewed by the health care professionals (described in the next chapter). However, these themes and sub-themes will be elucidated here for completeness of the qualitative data review.

Environmental

The majority of subjects were convinced that returning to their own home would some how make them better. One man said *"I'll feel better at home. I am well at home"* and when probed to gain further understanding about this he said *"It's not healthy here, I don't complain about the food but... that's what I like to do English and African cooking".*

Some, despite requiring help for the majority of activities of daily living insisted that they would be better at home, even though they conceded that their children had *"their own lives to lead".* Despite having limited funds of their own many felt that their own home was the most suitable place for them to live and none recognised the possibility that there would be any problems with getting the alterations and adaptations that would be necessary. That is, they were quite unrealistic about both their own limitations and the limitations and inadequacies of health and social services provision. There was only one woman who realised that she would be unable to manage and, though not entirely happy with the idea of going to live in a nursing home, had incorporated plans for what would happen in the nursing home into her vision of the future. This same person had previously been independent, was hoping to go to her sons for Christmas, but initially appeared to not wish to stay there for too long. Later, it transpired that the son did not have a downstairs toilet and she *"..couldn't manage the stairs and so I'll have to use the potty in the front room".* The embarrassment of inconveniencing everyone in such a way had made her feel that she would have to go to the toilet in the Nursing Home before she went round there, stay only a short time at her sons and then go back to the Nursing Home in time for her next trip to the toilet.

Some people already had the use of mobility aids prior to the stroke and felt they were essential for their future independence saying that they *"can't go anywhere without the stick you know"*. Others, who had been previously well, felt that if they only had a stick they would be *"able to push"* themselves along. Many repeated the statements of physiotherapists and insisted that having aids to use on their unaffected side would only mean that they would *"overuse the good side"*. For example, one woman's daughter had brought in a soft ball for her mother to *"exercise the bad hand with"* but had been told that *"we don't use those these days ...as they encourage abnormal movements"*. Others denied that they would need aids: *"I have the chair (meaning wheelchair) my family brought me, but I think I will walk...A big guy like me..I think I will walk again"*. Not only was he denying the need for the wheeelchair, but the pride of being such a big man and the shame of having to use such a thing was apparent.

A couple of people felt that *"winning the pools"* might be helpful so that they could get taxis to go shopping but the majority felt that extra money would not really alter their predicament.

Cognitive

"as long as I've got all me marbles" was often expressed not just in terms of what would be helpful to recovery, but in terms of what makes life worth living. One man urgently stressed to the researcher *"My senses are clear. I don't lose my senses. I got all my senses right? OK?!"*

Many said that memory for all past and current events was felt to be important, though even prior to the stroke some had had problems *"not so much remembering things* *from years ago"* but remembering peoples' names when bumping into them in the street or getting upstairs only to find that they had forgotten what they had gone up there for. Several people said they could not remember the first days or weeks of this hospitalisation and reported having trouble concentrating on books, the television or what the doctor had just said when they had come round.

Interpersonal Relationships

All subjects felt that their family's continuing input, both in hospital and later when they were at home, would be helpful both in terms of practical and emotional support. For example, their *"friends popping in"* and *"there are so many people I owe a debt of gratitude to that have helped me marvellously..but my husband and son have helped me so much"*. Though family and friends were seen as the major sources of support post-discharge (Informal support) saying some subjects knew that they would need. Formal support with *"meals on wheels every day except Sunday"*, *"home help really"* and *"someone to talk to outside of the family"*. A consistent theme was patients saying that talking to the interviewer was a help. For example, *"talking to you helps...someone who is interested"*.

5.4 Discussion

The data provided by the interviews performed for this study have raised many issues and have elucidated many differing ideas about what people feel may help them to get better and what they think will actually happen to them in the future.

This study has identified 11 themes (and corresponding sub-themes); motivation, coping, self-esteem, mood/affect, fate, treatment, function, behaviour, environmental, cognitive and interpersonal relationships thought to reflect what people who have recently suffered a stroke believe will help them to get better and what will happen to them in the future. The relationship of these findings to previous work performed in relation to recovery and readaptation to acute and chronic health problems will be identified below.

Anecdotally, clinical staff report that lack of motivation as preventing patients engaging in and benefiting from rehabilitation. This has been studied empirically by Saeki et al. (1993) who found that significant motivational deficits, as subjectively rated by physiatrists, were associated with a 20% reduction in rehabilitation effectiveness. In this study, the majority of subjects identified being determined and being well motivated as important in helping them get better. The majority felt that they were determined and communicated this to the researcher not just in the words spoken, but in the intonation and body language used. For example, gritting their teeth, clenching or shaking their fist and raising their voice.

Particular coping strategies have also been identified as adaptive in certain situations. For example, denial or avoidance strategies are reported or are apparent in the people interviewed, particularly when the problems to be faced are viewed as uncontrollable. Others in this study have identified strategies which involve active coping, that is engaging in problem solving or approach strategies generally when actions may allow control to be gained in a situation.

The results of this study have confirmed the work of others who have examined chronic disorders. For example, Rosenbaum and Palmon (1984) found that people with epilepsy, who believed that seizures were controllable, were less anxious, whilst those with a high incidence of seizures had high negative affect regardless of their beliefs about controllability. Dakof and Mendelsohn (1989) found that people with Parkinson's disease adapted to their problems more when they reported engaging in cognitive coping strategies. However, coping strategies were acknowledged as being limited to some extent because of the features of the disease.

Nevetheless, when examining causal attributions and adjustment to cancer (Lavery and Clarke, 1996) it was found that those who felt that they had adjusted well, not only exhibited less helplessness and made fewer changes to their social behaviour, but they were more anxiously preoccupied with their illness (Lavery and Clarke, 1996). These results are supported by the finding that emotion-focused problem solving has been shown to be beneficial to outcome in those with physical illness (Dean and Surtees, 1989; Friedman et al., 1990).

Similar coping strategies have been found when examining people with disorders which are acute in onset. The effects of patients' views on social and physical functioning at 6 months following a myocardial infarction have previously been examined (Bar-On, 1986). It was discovered that, when considering patient's attributions, that many used the coping strategy of denial. That is, they were either; insisting that they were fine or denying that there was an identifiable cause. That is, that their myocardial infarction was just some sort of unfortunate coincidence (e.g. a change in the weather). Further when asked what they thought would happen, they continued the "denial", believing that they would be able to do exactly what they had done up until now. This too shows similarities to the subjects in this study who reported that they would be going home and back to their usual life, regardless of their apparent severe disabilities. This also agrees with previous early literature on approach/avoidance strategies of coping (e.g. Seligman, 1974).

Feelings of self-efficacy and self-esteem have been suggested to be instrumental in the mobilisation of coping strategies (Bandura, 1977) and others have shown that "hardiness" (which is similar to self-efficacy) accounts for the variance in effective coping following major life events (Kobasa, 1979). Furthermore, the studies of Singer (1976) and Hyman (1972) have demonstrated how important feelings of self-esteem are to outcome, particularly psychological well being in people with Parkinson's disease. They concurred that low self-esteem, compounded by people being infantalised by their families, resulted in depression, demoralisation and a poor outcome. These studies did not look specifically at stroke, however, studies examining self-efficacy and perceived control in patients undergoing rehabilitation following stroke have shown similar results. For example, Partridge and Johnson (1989) demonstrated that perceived control was significantly related to recovery from physical disability.

In examining people's views of their adaptation to Parkinson's disease, differences in mood were identifed in those at different stages of the illness, but were also closely linked to people's attitudes towards the illness (Dakof and Mendelsohn, 1989). Following stroke, the negative effects of psychological distress on recovery and readaptation have also been recognised (e.g. Silverstone, 1990; Fiebel and Springer, 1982).

In the study reported earlier by Bar-On (1986) in patients following myocardial infarction, when asked what would help in the future, many reported that only fate or luck would determine what would happen. This is similar to subjects in this study, where people said for example, *"we all have to die of something sometime"*.

In Bar-On's study (1986) conventional medical advice and taking medication as directed were identified as important in assisting recovery following acute onset of an illness. For example, several patients stressed the importance of taking anti-hypertensive medication, following the therapists' advice or pursuing alternative therapies as did the patients in this study.

The relationship between age, physical decline, the requirements for leading a normal life and feelings of control over the future, have previously been examined. For example, Brothen and Detzner (1983) in a community study, demonstrated a relationship between dependency, poor health and the attitudes of older people to ageing and disability. The subjects of this study also stressed the importance of physical competance in their recovery and readaptation. Of particular note was continence, which was reported by the majority of the sample as being imperative for their recovery. To most of us it would seem unsurprising as we can generally identify with the feelings of decreased self esteem and stigma associated with such problems. It is well recognised in the literature that those who are continent are more likely to do well following stroke (e.g. Barer, 1989; Gladman et al., 1992; Perez et al., 1997) however, previously it has been suggested that this is mainly due to incontinence being a marker for a more severe stroke.

Several patients identified lifestyle changes that would be consistent with the literature on risk factors for heart disease and stroke. For example, having a low fat diet (e.g. Herbert et al., 1995), stopping smoking (e.g. Shinton and Beevers, 1989) and leading a more stress free lifestyle (e.g. Harmsen et al., 1990) which have all been previously shown to be associated, if not tentatively, with first ever and recurrent strokes. Socialising was also identified, and this would be consistent with several factors, stress reduction, elevation of mood, encouraging informal support mechanisms etc. Once again we see the inextricable connections between what is cited by people as what will be helpful and the previous literature.

Having somewhere suitable to live and gaining access to relevant aids and adaptations are cited as being important for recovery and readaptation following stroke. This perhaps is unsurprising as these aspects appear more tangible and controllable than other more etherial aspects (e.g. mood). Furthermore, it has been suggested by others (e.g. Mechanic, 1995) that the control associated with being able to organise the individual's immediate environment may allow the person to feel that they can manage irrespective of impairments. In order to action these improvements or innovations, financial security in the form of social security or social services support has previously been recognised as being helpful to recovery (Bar-On, 1986).

Many of these perceived and reported influences on outcome by subjects in this study, are influenced by and necessitate effective cognition (Bandura, 1977). For motivational influences to be brought into play, cognitive resources must be present otherwise the person would not be able to visualise future outcomes or goals and to recognise when performance matches desired performance. Furthermore, cognitive deficits have been shown to compound functional problems, for example, incontinence and impaired mobility (Borrie et al., 1986).

These problems can to some extent be ameliorated by effective social support. This has previously been recognised as being important in assisting recovery, and has been used to good effect in promoting rehabilitation. For example, Evans and Miller (1984) suggested that mobilising the resources of family and friends (informal support) and encouraging them to reinforce desired behaviour in those undergoing rehabilitation programmes could be beneficial in recovery. Others (e.g. Mechanic, 1995) have suggested that organising assistive devices and helping to mobilise health and social services (formal support) is also necessary in order to complement informal support networks.

The results of this study, in identifying what people believe will happen to them in the future and what is likely to help, have identified factors that have previously been shown to be important to people with chronic and disabling diseases. Previous studies have also highlighted the importance of the heterogenious nature of people's attitudes, beliefs and expectations depending upon and despite, for example; the stage of the disease, the level of impairment and the effects of the disorder or disability on lifestyle (e.g. Dakof and Mendelsohn, 1989; Feibel and Springer, 1982; Hyman, 1972,). It is also apparent that the categories or themes identified are not mutually exclusive but are inextricably inter-twined, the presence of one being contingent upon or possibley the result of another. Later, in the main study for the thesis, the relative contributions of these differing factors will be examined in the light of individual patient's beliefs and expectations.

Whilst recognising the face validity of the results of this study, it is imperative to concede the limitations inherent in the collecting and interpreting these findings and consequently their generalisability and future use.

The subjects for the study comprised people who had been admitted to hospital with an acute stroke. The researcher had identified subjects from the hospital stroke register, a reasonably reliable source of people in whom a diagnosis of stroke has been or will be confirmed or refuted post stroke. However, in order to identify people to interview, the researcher had relied on information provided by ward staff about the ability or inability of these people to communicate their ideas about recovery from stroke. It may be that the resultant sample were biased towards those patients who were more articulate and would perhaps generally express opinions that were thought acceptable by staff. The researcher may have been directed to those people that would view traditional rehabilitation methods or a more medical model as being helpful for recovery. That is, the researcher may have been directed away from people with more idiosyncratic views. This may therefore have limited the breadth of ideas accessed.

Further, those patients unable to respond verbally would not have been included and this further limits the investigation to the views of those without severe communication or cognitive problems. Furthermore, subjects needed to be willing to participate and this precludes the inclusion of those who would not feel confident in such situations or those who are clincally depressed or otherwise anxious or of low mood.

In terms of the group studied, although the researcher endeavoured to recruit a purposive sample, to some extent the actual sample obtained could be regarded as a convenience sample. That is, those patients who happened to be in hospital at the time of recruitment, who happened to display a variety of backgrounds. The researcher did not have a systematic method to ensure a truly representative quota of people who had had an acute stroke and the generalisability of the results obtained, even to those having had a stroke in Liverpool could be brought into question. The exact number of subjects to be interviewed was not stated explicitly at the outset and the researcher continued to recruit further subjects until in the researcher's opinion, that no new ideas were being generated. To some extent a trade off was instigated between the time required to perform further interviews and the number of new ideas generated in each interview. This too may have limited the breadth of ideas generated.

By using face to face interviews, the researcher may limit the information obtained as people may be reluctant to express the true nature of their ideas for fear of embarrassment or may express ideas which they feel were expected by the researcher or are suggested by the nature of the research. For example, although it was never explicitly stated, the researcher had a nursing background and this may have been apparent to the patients by the way that the researcher related to other staff and the way they made the patients physically comfortable.

Consequently, subjects may have expressed ideas which would reflect the necessity to have more or less nursing or caring type assistance. It was obvious at times that the subjects did not wish to be seen to be criticising nursing staff, as they frequently excused non caring behaviour as being a result of staff shortages and not as a fault of the individuals themselves.

The personality of the researcher and their ability or inability to develop a rapport with each of the subjects may further have limited the information obtained. Because of this and because interviews were unstructured, the results gained may not be reproducible by another researcher.

The researcher endeavoured to design the study in order to overcome some problems of interfering with the results, for example, by asking patients to wait till end of interview to obtain a response to their specific questions to the researcher regarding ideas about expectations of recovery. However, by not answering peoples' questions immediately this too could have interfered with the rapport between researcher and subject and thus limited the depth of the interview.

Patients life roles were used as a tool to enhance the semi-structured interview. However, despite the researcher explaining what she meant by a role, each patient could have interpreted this in a different manner and reported their ideas from different stand points. Furthermore, the answers received are only as good as the questions asked. Because of the difficulties encountered when endeavouring to listen carefully to what the person is saying at that moment whilst simultaneously manoeuvre the conversation to continue to focus on the topic in question, this too may limit the scope and depth of the interview. The researcher was aware of some of these problems when transcribing the tapes verbatim, where she appeared to hear some comments for the first time. It was recognised that themes may have been missed by the researcher not being able to thoroughly pursue every potential area for further investigation or discussion. Some of theses problems may have been overcome by the researcher returning to subjects in order to further discuss new areas identified when transcribing the tapes. This was not performed. In the researcher themselves performing the transcriptions, these problems at least could be recognised and it was felt by the researcher that they, to some extent learned from their mistakes and that expertise in both listening and responding developed as the study progressed.

In analysing the qualitative data obtained, the researcher first read through the whole texts and identified individual statements in context. However, later these statements were isolated from the interviews themselves and were used to represent themes. The very removal of statements from their context can lead to misinterpretation. This may have been overcome by the researcher checking with patients and future raters that the meaning they perceibed when the statement was viewed in isolation was similar to that when read in the context that it had been stated. This was not done in this study.

The researcher determined which statements they considered to be irrelevant or relevant to answer the **help** and **happen** questions. Despite the inter-rater reliability of statements being relevant or irrelevant between Rater 1 and Rater 2 only being "fair" (as opposed to good), the statements rated as relevant by the researcher were included. Additional statements felt to be relevant by Rater 2 were also included. This may have resulted in more ideas than necessary being ultimately tested out in the questionnaire. Further clarification of the aims of the interviews between raters may have improved subsequent inter-rater relaibility (confirmability) but this was not performed.

Initially, only 8 themes were identified from the data, a further 3 themes were identified on revisiting the data for a second time. This could have been a result of the themes identfied being ill-defined or not considered fully with respect to their possible meanings. Some statements could have reflected several themes or sub-themes (this will be discussed further in the following chapter with respect to the health care professionals ratings of the representativeness of statements with respect to themes and sub-themes).

The study aimed to identify the ideas of people who had suffered a stroke with regard to what they felt would help them to get better and what was likely to happen to them in the future. In analysing the data from the qualitative interviews in the light of current psychological and social theory, it could be suggested that the ideas of patients was subsequently transformed or fitted into the existing ideas of health care professionals. That is, going against the original purpose of using patient interviews to devlop a questionnaire not based of staff' ideas.

Fitting the data to the existing theoretical framework, may have further limited the breadth of ideas identified from the rich data which had been generated. A grounded theory approach, where the literature was not searched previously may have been a more appropriate design, where themes would have resulted solely from the data, and not from current psychological and social theory.

5.6 Conclusions

This preliminary work has allowed the identification of what people expect to happen and the perceived contribution of physical, functional, psychological, social and environmental factors in recovery following stroke. Issues have been raised which may provide a way forward to the improved identification of and intervention in psychological adjustment problems in the aftermath of stroke.

Statements, sub-themes and broad themes have been identified in the format of patients own words. The interpretation of each statement as relevant or irrelevant to the questions to be answered has been validated by ratings from an independent assessor.

In the following chapter the questionnaire, to identify patient's ideas about what **will help** and what **will happen** in the future, will be constructed according to a framework indicated by the numbers of themes and their related sub-themes. The statements which are to reflect each of the sub-themes (and consequently each theme) thus required further analysis to ensure their suitability for inclusion in a questionnaire for stroke sufferers. That is, to remove words or statements which contained jargon and colloquialisms and to include those which would be intelligible to most people and to ensure that they were representative of the intended themes and sub-themes.

Chapter 6

Questionnaire Design and Development

The last chapter gave a qualitative account of stroke patients' responses when they were asked, in a pilot study, what they thought would help and what they would happen in their stroke rehabilitation. The purpose of the present chapter is to describe how a questionnaire was designed which could be used in the main study to allow examination of the hypotheses to be tested.

The desirable properties of any attitude questionnaire would be; that it accurately identifies a useful construct or constructs (validity), that it has proven reliability and that it is suitable for use in the particular client group for whom it is intended (utility). The specific requirement for this questionnaire, in the context of this study, is that the questionnaire should reflect what patients' think and not what health care professionals think they might think.

Therefore, the questionnaire was initially multi-dimensional, the dimensions reflecting the themes and sub-themes identified from the patient interviews described in the previous chapter. These themes and sub-themes were subsequently to be represented in the questionnaire by statements generated by the patients themselves, in a lay and not health care professional's language.

This chapter starts by reviewing the literature on questionnaire design and will explain how each of these 3 issues (validity, reliability and utility) could be addressed. The chapter will then go on to explain how validity, reliability and utility have been addressed in the context of this questionnaire's original design and the processes in the questionnaires development which have resulted in the final version. Lastly, the use of this questionnaire in the main study will be discussed together with the questionnaire's limitations.

6.1 Questionnaire Design

6.11 Background

In order for the results of questionnaires to be generally applicable, they must be rigorously designed according to strict criteria. The rigours of design and these criteria will be elucidated in this chapter and the factors necessary for the successful building of a measurement instrument will be explained. The thesis restricts itself to considerations necessary for the development of a questionnaire for this particular client group.

6.12 Validity

In order to make inferences about a person based on the results of the administration of a questionnaire, it is necessary that the questionnaire is valid. When a questionnaire is supposed to reflect something that can not be directly observed, it is often necessary to compare predicted performance using that instrument with actual performance (e.g. As described in Chapter 3, the accuracy of physiotherapists' predictions, in terms of both Global and Barthel functional scores were determined by comparison with actual patient outcomes. A previously validated tool was used and limitations were also elucidated).

Streiner and Norman (1996) suggest that:

> *"...validating a scale is really a process whereby we determine the degree of confidence we can place on the inferences we make about people based on their scores from that scale."*

Many different types of validity have been described:-

- Face validity concerns whether the scale appears, on the face of it, to measure what it is intended to measure and can thus only be evaluated subjectively.
- Content validity concerns how the scale's content appears to reflect all the domains to be investigated. That is, each domain should be represented by at least one question and consequently it has been suggested that content validity should more aptly be called "content coverage" (Messick, 1980). Furthermore, each item should reflect a domain that needs to be covered. If erroneous questions are included then this too can introduce error, as these items would discriminate between patients in a domain that was not related to the purpose of the questionnaire.
- Construct validity demonstrates how well the test links up with a set of theoretical assumptions about an abstract construct.
- Criterion validity reflects how the questionnaire compares to some sort of "gold standard" (e.g. depression items compared to the General Health Questionnaire 28) and can be examined in terms of concurrent and predictive validity:
  - Concurrent validity relates to how the questionnaire compares with the "gold standard" when both are administered at the same time.
  - Predictive validity relates to how the questionnaire's scores at an earlier time point compare with scores on either the same questionnaire or a different outcome

variable at a later time point (e.g. how questionnaire scores are predictive of "successful" or "unsuccessful" outcome).

It must be stressed that each time a questionnaire is used in a different client group or in a different situation (e.g. at a different time point since a stroke) it will require re-validation at that point.

6.13 Reliability

It is essential to have a measure which is both valid and reliable and, reliability is a pre-condition for validity. There are many different types of reliability; test retest, inter-rater, intra-rater, internal consistency and split half reliability. Reliability, refers to how consistent the results are; in the same people at different time points (test-retest reliability), between different items on the same uni-dimensional test (internal consistency) between different raters on the same subject at the same time (inter-rater reliability) and in the same raters on the same people (intra-rater reliability) at different time points. As Streiner and Norman (1996) suggest:

"reliability is a fundamental way to reflect the amount of error, both random and systematic, inherent in any measurement..." and *"...the reliability co-efficient reflects the extent to which an instrument can differentiate among individuals"*.

That is, questionnaires are useless if unreliable, as differences obtained may not reflect real differences between individuals. It is also important to understand that reliability and agreement are not necessarily the same thing, though they are frequently cited as such (Streiner and Norman, 1996). For example, if you reduced the range of responses on a scale (e.g. from better, same or worse, to better or worse) the percentage agreement will increase but reliability will be reduced. This is because the "chance" element is increased (i.e. in the first instance there is 33.33% possibility of raters scoring the same by chance, but in the second instance chance could account for 50% of the agreement). Reliability necessitates "removal of agreement due to chance" and therefore the second instance would prove less reliable even though agreement might appear better.

Internal consistency, on the other hand relates to how the items on the scale relate to the other items in the scale. For example, if we are trying to measure a single trait, then the items on the scale should each represent or reflect a different aspect of this one trait and should not reflect different traits. Therefore, each item's score should correlate moderately with each other item's score, and should also correlate moderately with the total score. Using this assumption it is therefore implicit that the scale or a sub-section of it should have established uni-dimensionality. If the scale were multi-dimensional it may not be applicable to add up every item together to form a total, it may only be valid to add up each item for each dimension. Therefore, before determining internal consistency it is important to establish the structure of a questionnaire.

Factor analysis (Spearman, 1904) is a multi-dimensional scaling technique which is used to simplify complex sets of data, particularly correlation matrices of answers derived from questionnaires, where the relationship between each of the variables is not previously known. Factor analysis is only applicable when the items or variables are actually correlated with each other. The term "factor" is used to describe an underlying trend (unique dimension) to the correlations of the dependent variables.

A factor is; "a construct operationally defined by its factor loadings" and factor loadings are; "the correlations of a variable with a factor" (i.e. correlations between the "principal components and the dependent variable", Kline, 1994). The meaning of factors is derived from analysis of the loadings. That is, the meanings attached to variables that load highly are reviewed and the factor meaning is conceptualised.

Therefore, factor analysis can be used to identify correlations between the items in a questionnaire, to identify the most important variables and the underlying constructs and subsequently to allow simplification of the questionnaire.

The sum of squares of factor loadings for each factor represents the proportion of the total variance which is explained by each factor and is termed the "Eigenvalue". The larger the Eigenvalue, the more variance that is explained by that factor and it is generally accepted that only factors with an Eigenvalue of greater than 1 should be considered. Conversely, if the Eigenvalue is close to 0, then the error matrix may be singular and a factor analytic method may be inappropriate.

The number of Eigenvalues which are greater than one thus represents the number of factors necessary to explain the majority of the variance. Those with Eigenvalues less than one explain very little of the variance.

Once a questionnaire's uni or multi-dimensionality has been established then the internal consistency of the whole questionnaire or its dimensions needs to be identified and Cronbach's alpha co-efficient (Cronbach, 1951) is the most commonly used measure of internal consistency. Essentially it estimates the correlations for different versions of the same measure. It measures the correlation between each item's score and compares it to the total score with that item deleted. Therefore, the "alpha when item deleted" indicates how much each item contributes to the total correlation between items. This allows the researcher to discover which items contribute little and which contribute a great deal to the total correlation score. Alpha can have values of between 0 and 1 (negatively correlated items are not part of an entity and if found should be removed from the scale as they violate the model). Increasing the number of items increases the internal consistency of a scale and consequently results in increased reliability of the scale. However, if the scale becomes too long then its utility (see section 6.13) may be reduced as respondents may fail to complete a lengthy scale or may respond carelessly towards the end of it. The other problem is that if alpha is too high, then this could indicate that some items are redundant (they are asking the same question in different ways) and if it is too low then the scale may not be measuring a single construct. It has been suggested that alpha should be greater than 0.70 less than 0.90 (Nunally, 1978). As is evident, a balance must be achieved between length, reliability and internal consistency.

6.14 Utility

Questionnaires should also be shown to be suitable for use in the client group for whom they are intended. Some design criteria are applicable to all questionnaires and others are particularly relevant to the elderly and those who have particular problems because they have suffered a stroke. In general, questions should; not be too long (20 has been suggested as a maximum), not be double-barrelled (e.g. what are the advantages and disadvantages), double negatives should be avoided (e.g. non-attendance should not be allowed) and ambiguous, jargon or technical terms should not be used (Oppenheim, 1992).

Several techniques have been developed to check the level of reading skills necessary to understand text (e.g. Flesch, 1948). It has been suggested that one should not expect the raters to have reading skills beyond the equivalent of a twelve year old (Streiner and Norman, 1996) and the simplicity of words (i.e. words with few syllables) is important. Flesch (1948) devised a method of analysing the numbers of syllables in each word and the number of words in each sentence. This resulted in the Flesch Formula which results in a "Reading Ease Score".

The Flesch formula consists of:

Reading Ease = $206.835 - 0.846W - 1.015S$

where: W = average of syllables per hundred words

S = average number of words per sentence

However, these types of formulae were generally developed for use in the analysis of passages of text and are not suitable for use in isolation with questionnaire type material where each statement generally needs to be interpreted in isolation with the meaning often being dependent on one word (Streiner and Norman, 1996). That is, these type of text analyses need to be used in conjunction with another method to ensure that the meaning is correct. For example, one could use Flesch to ensure that the text is not too complicated and then use independent raters to ensure the correct meaning of each statement. A description of how a combination of these methods was used to ensure that the questionnaire would not be too difficult to read (the Flesch formula) and also that each statement would reflect the meaning of each theme and sub-theme as required by the framework devised following the qualitative study (described in Chapter 5) will be included here.

Taking all of these points together, in order to develop a questionnaire in a systematic way then it is necessary to take certain steps which will be described in detail in the remainder of this chapter. These steps will include; checking of the readability of the questionnaire, checking of the agreement between the meaning of each statement and its corresponding theme and sub-theme, determining of the multi-dimensionality or uni-dimensionality of the questionnaire with the factor structure and internal consistency of the scale. Lastly, we will describe how the validity and reliability of the questionnaire could be further established.

6.2 Questionnaire Design

6.21 Readability

6.21(1) Methods

The subjects in this study were the statements (items) that had been selected from the content analysis described in the previous chapter. The analysis to be described was initially performed using the original 32 statements reflecting eight themes. However, the analysis was later performed using 44 statements reflecting the eleven themes. The final analysis is described here.

There were 44 statements in total, each representing one of the four sub-themes, which in turn represented each of the eleven main themes. Statements were selected by the researcher, that were felt to be uni-dimensional and were not ambiguous, did not contain difficult words, jargon terms or colloquialisms and could be read by the target population.

The statements were then analysed using the Flesch Formula (Flesch, 1948). Therefore, the number of words in each statement were counted and the number of syllables in each word were also counted and the results analysed to produce a "Reading Ease Score" (as previously described in section 6.14).

6.21(2) Results

For this study:

$W = 1.45 \quad (145/100)$

$S = 7 \quad (224/32)$

$\text{Reading Ease} = 206.835 - 0.846 \times 1.45 - 1.015 \times 7$

$= 206.835 - 1.227 - 7.105 = 198.503$

6.21(3) Discussion

This sub-study has shown that (according to Ley, 1988) that this questionnaire is "very easy", can be read by 10 year olds, could be understood by more than 97% of the population who are over 25 and by more than 91% of those over the age of 65 years.

This readability score must be interpreted with caution (as previously described in section 6.14) as the Flesch formula is primarily intended for analysing the complexity of passages of text. Further, the researcher themselves identified the number of words and syllables in each statement and these ratings were not subjected to inter-rater reliability tests. As the researcher knew the purpose of the ratings and the requirement for simplicity of statement, bias could have inadvertently been introduced. Furthermore, the questionnaire was being developed for people who had recently suffered a stroke. No method currently exists to take account of the level of complexity required for this particular group in terms of readability. The heterogeneous nature of stroke and its resultant deficits mitigates against this.

6.21(4) Conclusions

Though it would appear from this preliminary analysis that the statements included are readable, further investigation is necessary. The actual meanings of the statements in terms of how they reflect the sub-themes and themes must be established. The next sub-study explains how independent assessors were used to validate the meanings of each statement.

6.22 Establishing the Meanings of Statements/Items

6.22(1) Methods

Eight health care professionals (1 Doctor, 4 Research Nurses, 3 Psychologists) were asked to independently rate each of the 44 items with regard to how statements related to themes and sub-themes. Therefore, each rater was provided with three response sheets, each of which had three columns and 44 rows. The third column was left blank.

The first two columns contained each of the following three options;

Sheet 1:	Each sub-theme and its theme
Sheet 2:	Each statement and its sub-theme
Sheet 3:	Each statement and its theme

Each health care professional was asked to read each pair of items in column 1 and column 2. They were then asked to rate how much the former item reflected the latter item on a scale of 0 -10 (10 being the most representative). They were asked to record their response in column 3. That is, whether statements reflected each of the themes or sub-themes that they were supposed to. The mean score (total score divided by the number of raters), the standard deviation and inter-quartile ranges (IQRs) were calculated for each rating.

6.22(2) Results

Table 12 Ratings for statements, sub-themes and themes.

Comparison	Range of Means	Range of Standard Deviations
Sub-theme and theme	5.9-9.7	0.54-3.19
Statement and sub-theme	7.3-9.9	0.38-2.87
Statement and theme	6.7-10.0	0.49-3.30

The mean score for each comparison, the standard deviation and IQRs are tabulated and can be found in Appendix 5. The range of means and range of standard deviations for all three types of comparison are shown in Table 12 above.

When comparing how sub-themes reflected themes, the lowest mean score was 5.9. This was for the sub-theme "Avoidance/Denial" as compared to the theme "Coping" (this was also represented by the largest standard deviation of 3.19).

When comparing how statements reflected sub-themes, the lowest mean score was 7.3. This was for the statement "Doing what has to be done, one step at a time" as compared to the sub-theme "Problem Solving". Though the largest standard deviations for scores for this type of comparison (2.87) was between the statement "Knowing that we all have to die of something sometime" and the sub-theme of "Inevitable" and similarly between the statement "Changing my lifestyle (the way that I live)" and the sub-theme of "Lifestyle".

When comparing how statements reflected themes, the lowest mean score was 6.7. This was for the statement "Ignoring the problems" as compared to theme "Coping" (this was also represented by the largest standard deviation of 3.30).

6.22(3) Discussion

This sub-study has confirmed how the statements chosen reflect the sub-themes and themes suggested by the researcher. As is evident there is some variability in the way that the participating health care professionals considered statements, sub-themes and themes to reflect each other.

As can be seen the most problematic statement appeared to be "Ignoring the problems" the statement reflecting the sub-theme "Avoidance/Denial" and the theme "Coping". When examining the raw scores further, the low scoring of this item was due to one nurse scoring this item 0 for all three comparisons. When this was discussed with her, it was discovered that she had scored it 0 because she did not see it as a "successful" coping strategy, though she conceded that this was not what she had been asked to rate.

Several health care professionals commented that statements could have been considered to reflect some of the other sub-themes. For example, the sub-theme, Cognitive Activities of Daily Living, was represented by "Being capable of making my own decisions" but perhaps could equally have been represented by "I'll be able to concentrate on important facts".

By pre-defining themes, sub-themes and the statements that the researcher felt reflected each other, this may have biased the responses made by the health care professionals. That is, health care professionals would know that the researcher intended those elements to reflect each other and may have over estimated how each reflected the others. It would have been more rigorous to supply the health care professionals with the statements on cards and ask them to sort them onto piles under sub-themes and then asked them to sort the sub-themes onto the themes.

Only those themes, sub-themes and their statements identified originally by the researcher were subjected to reliability checks by the health care professionals. When the further 3 themes of; environmental, cognitive and interpersonal relationships (as described in Chapter 5) were identified, with their corresponding sub-themes and statements, these were not subjected to independent assessment before inclusion in the questionnaire.

The researcher considered that the overlap between statements and sub-themes would be minimised by future analysis where inter-item correlation co-efficients were compared and redundant items excluded.

6.22(4) Conclusion

It was decided to continue with the preliminary structure and statements. The questionnaire was therefore constructed. The order of the items was determined by allocating each a number and, by using a statistical package to generate random numbers between 1 and 44. The original structure of the questionnaire and the eventual number of each item can be seen in Appendix 6.

The preliminary format of the 44 item questionnaire to determine the answer the two questions; what will "Help" and what will "Happen" was developed incorporating the 11 themes of; motivation, coping, self-esteem, mood/affect, treatment, fate, function, behaviour, environment, cognitive and interpersonal relationships.

An explanation of both the necessary study and the preliminary analysis required for the further development of the questionnaire will now be described.

6.23 Preliminary Study: Piloting and Analysis

6.23(1) Background

The rationale for, and the preliminary format of, the Stroke Expectations Questionnaire has previously been described. The questionnaire had been systematically developed from the patient's perspective. However, though a preliminary structure had been suggested, this format needed to be verified in a new group of people who had suffered a stroke. As the questionnaire was intended to identify patient's ideas in the first few weeks after stroke (in order that they could later be compared with outcome at 3 months) it was imperative that it was tested in this group at an early stage following an acute stroke. In order for the responses to the questionnaire to be thought accurate it is imperative that it is shown that the client group in whom the test was developed either did not have severe cognitive or communication problems, or if they did, to identify those with and without problems. Subsequently, responses to each of the scales could then be compared and it could be determined whether those with cognitive or communication problems respond differently.

This sub study aimed to:

- Establish the validity, reliability and utility of this questionnaire
- Develop a final version of the questionnaire for use in the main study
- Identify the limitations of the questionnaire

6.23(2) Methods

6.23(2a) Subjects and Sampling

A register is kept of all acute stroke admissions to a District General Hospital. All patients entered onto this register were considered for inclusion in the study. Those with severe cognitive or communication problems, those who were too ill or those who were unwilling or unable to consent, were excluded from the study. Although patients were generally identified prospectively, some were identified from hospital information systems post-discharge, and following case note review, were added to the stroke register retrospectively. As the Research Team was unaware of these patients during their hospital stay, it was not possible to consider these patients for inclusion. Those patients discharged within 1 week post-stroke, who returned to Stroke Review Clinic within 4 weeks post-stroke were also included.

6.23(2b) Assessments

In the parallel to the stroke register, a minimum dataset is collected on all patients and includes basic demographic details (e.g. age, sex, previous cerebrovascular disease and handicap) and stroke specific details (e.g. site and side of lesion).

The rationale for, and a description of the screening tools to be used for, the detection of cognitive and/or communication problems in the subjects in this study will first be discussed and described.

- **Screening for Cognitive Impairment**

The main screening tools for cognitive impairment concentrate on assessing orientation for; time, place and person; short term and long term memory. The most simple of these, which is widely used in the elderly, is the Abbreviated Mental Test score (AMT, Hodkinson, 1972) which includes just 10 items and takes only a few minutes to administer.

However, the range of possible cognitive problems following stroke is diverse. A more comprehensive assessment exists, the Mini Mental State Examination (MMSE) (Folstein et al., 1975). The MMSE is an 11 item test, is scored from 0-30, with a score of less than 23 being taken to indicate significant cognitive impairment. The MMSE examines; orientation, registration, attention, calculation, recall, language, ability to follow complex commands, writing and figure copying. The MMSE has been shown to have reasonable inter-rater reliability (IRR), with Molloy et al. (1991) reporting IRRs of 0.69 and test retest reliability (in a 2 week period) of 0.69. A range of differing cognitive tasks are covered by the MMSE, however, as it involves being able to see, talk and write, some stroke patients may have difficulties with completing some parts of the test. It takes approximately 20 minutes to administer and subsequently, concentration may be a problem for some patients. It has been suggested that treating answers to unanswered questions as errors is the best approach (Fillenbaum et al., 1988). However, this was suggested following its use in older, physically able people. It is possible that should this stance be taken with people who have had a stroke, then cognitive problems may be over estimated. For example, if they are unable to complete items due to physical or vision problems. It was felt by the researcher that it may be more appropriate to pro-rate these items in people who have had a stroke, or at least note where potentially physical/functional problems may have resulted in patients scoring less than 23. That is, immediately following the administration of the MMSE, the total score was reviewed. If the researcher considered that patients understood what was being asked of them even if they could not actually perform the task (due to deficits as a result of the stroke), then the patient was still included in the study despite scoring less than 23 on the MMSE. Their actual score was noted. This issue will be addressed further later in the thesis.

- **Screening for Communication Problems**

The Frenchay Aphasia Screening Test (FAST) was specifically designed for use by non-specialists and takes between 3 and 10 minutes to complete. It examines; comprehension, expression, reading and writing. The comprehension and expression sub tests can be used by themselves to detect aphasia, although one should be aware that dyslexia, a difficulty in reading or dysgraphia, a difficulty in writing, may be missed. Recommended cut-off points for these two sub-scales out of a possible 20 are; 17 for those aged 20-60, 16 for those 61-70 and 15 for those over 70. It should be noted that illiteracy, hemianopia and visual field or visuospatial problems may alter results. Though it was primarily developed to screen for aphasia, it has been shown to give a reasonable indication of severity of communication problems (Enderby et al., 1987b) but does not take into account non-verbal communication (gesture). The authors recommend it as a screen before administering other batteries of tests.

- **Stroke Expectations Questionnaire**

The preliminary format of the Stroke Expectations Questionnaire (SEQ) consisted of 44 items each to be responded to provided an answer to, and to allow comparison of, the “Help” and “Happen” formats. The researcher felt that what people thought may ideally help may be quite different from what was thought might happen in some people, may be similar in others and in comparing and contrasting the two further insight into the relationship between patients' ideas and outcome after stroke.

Therefore, each of the 44 statements were to be presented to the stroke sufferer. This would allow the researcher to determine whether a questionnaire addressing each question separately would have different or similar factor structures and would also allow comparison between both sets of responses. The SEQ (as previously described) was developed to incorporate the 11 themes (identified from the qualitative study described in Chapter 5) of; motivation, coping, self-esteem, mood/affect, treatment, fate, function, behaviour, environment, cognitive and interpersonal relationships. It was intended that the questionnaire would be self-administered (though it could be read out and answers recorded by the interviewer where necessary) and answers scored on a 5 point Likert scale. Thus respondents would be required to select 1 of 5 alternative responses which ranged from "not at all" to "a great deal" in response to each of the 44 statements, in answer to the 2 questions:

1) *"How much do you believe that this will help you to get better?"* (SEQ Help)

2) *"How much do you believe that this will happen in the future?"* (SEQ Happen)

6.23(2c) Data Collection Procedure

In order to identify suitable and willing patients, the researcher accessed the stroke register and ward location sheets kept by the stroke research team. Each patient is allocated a unique number as their identifier (the Register Number). The Register number is allocated by the research team in casualty, on admission to the stroke unit or another outlying ward. Patients are allocated the next consecutive number. This generally, though not always, corresponds to the date and time of admission. The ward location sheets contains a list of patients by ward in Register number order. That is for each ward those with the lowest numbers (those admitted earlier) would be higher up the list and those with highest numbers (those admitted later) would be lower down the list.

For this study the researcher obtained a copy of the ward lists. On entering each ward the researcher would approach the first person on the list (who had not already been included in the study). They would then be consented screened and included in the study if suitable. The researcher would then go to the next person on the list, and so on. Should the person approached have visitors, be having therapy or be off the ward at that time (for example, to have a CT scan), then the researcher would arrange to come back either later that day or the following day. This aimed to ensure that people were being assessed as early in the second week post-stroke as possible. However, for those patients who were discharged within the first week but who were subsequently included in the study, they mainly returned to Stroke Review Clinic in the fourth week and were assessed in the clinic at this time point. This group of people were not assessed as early after their stroke as those assessed whilst still in hospital and they may have responded differently to the questionnaire. No comparison was made between the responses of these 2 groups to determine if there was a statistically significant difference.

Patients identified from the register, and potentially satisfying the inclusion and exclusion criteria, were provided with an information sheet explaining the purpose of the study. They (or their relatives if they were unable to sign) signed a consent form. They were reassured that all information provided would be kept strictly confidential and that they could withdraw from the study at any time (without giving a reason) and that this would not affect their future care or treatment in any way.

The MMSE and FAST were performed and those with severe cognitive and/or communication problems were excluded at this point. Those who were to be excluded were debriefed.

In those who were found to be suitable for the study, the format of the questionnaires were explained and the patients were instructed to complete the SEQ Help and the SEQ Happen. If the patients could not manage to complete the SEQ by themselves (due to visual field or limb weakness problems) then the researcher read them each question and completed their response on the 5 point Likert scale. Results were collated and entered into the SPSS database and data were analysed as detailed below.

6.23(2d) Data Analysis Procedure

The numbers and percentages of those included and excluded was determined. Descriptive statistics were calculated for the numbers of males and females, age, whether subjects had had a previous stroke and the side(s) of deficit as appropriate.

As described earlier, it was important to determine the questionnaires' uni or multi-dimensionality so that the internal consistency could be determined, for the whole questionnaire and/or the themes (respectively). However, though a multi-dimensional factor structure may appear to have been found, it may have been that when internal consistency was examined, that not all dimensions were shown to be internally consistent and therefore not valid dimensions. In these circumstances it was then be necessary to exclude invalid dimensions, further conceptualise the factors and once again determine the internal consistency of dimensions.

Therefore, it was necessary to take an iterative approach and the thesis will take the reader through the analysis step by step. The methods used to determine the initial factor structure will be described in the results section. That is, Principal Components factor analysis was be used to identify the factor structure. Factors were then further conceptualised using Varimax (Orthogonal) Rotation. The determination of internal consistency is described in a later section and any further iterative steps that were necessary will be subsequently described. For clarity, a summary of the rationale and methods used at each step will be detailed at the start of each section.

6.23(3) Results

6.23(3a) Subjects and Description of the Sample

Of the 511 patients admitted between January to November 1996, 178 patients (35%) were included in the study in the first 4 weeks post-stroke. Table 13 shows the reasons for non-inclusion.

In this study, 119 (23%) patients were excluded due to severe cognitive or communication problems. Patients without speech problems (dysarthria or dysphasia) but having cognitive problems were classified as have severe cognitive problems, whilst those with severe communication problems where the assessment of cognition was impossible, were classified as having communication problems.

There were 131 patients who were not considered for inclusion whilst in hospital as they either died or were discharged in week 1 post-stroke. However, 40 returned to Stroke Review Clinic before 4 weeks post-stroke and were then included in the study. A further, 31 patients were screened, found suitable for the study, but either died or were discharged before the researcher could perform their assessment in hospital. However, 10 (of these 31) were seen at Stroke Review Clinic before 4 weeks post-stroke and were then included in the study. One patient was known to be moving out of the area and it would not be possible to follow them up.

Table 13 Reasons for non-inclusion in the study

Reason for non-inclusion	**Frequency (%)**
Severe cognitive (N=23) / communication problems (N=96)	119 (23)
Discharged/Died week 1 (not returning to clinic <4weeks post-stroke)	91(18)
Died/Discharged before inclusion (not returning to clinic <4weeks)	21 (4)
Too ill/Unable to consent	23 (5)
Refused	3 (<1)
Follow up not possible	1 (<1)
Retrospectively identified	75 (15)

178 patients (99 male, 79 female; median age 71, IQR 64 to 78) were included in the study and each completed the Stroke Expectations Questionnaires (SEQ Help and SEQ Happen). A summary of the patient characteristics is shown in Table 14 below.

Table 14 Patient Characteristics

Variable		All patients N=178
Mean Age (SD)		70.6 (10.0)
No. of Females (%)		79 (44)
No. with Previous stroke (%)		44 (25)
Side (number in each category)	left (%)	100 (56)
	right(%)	60 (34)
	neither (%)	13 (7)
	both (%)	4 (3)

The frequency of scores for each of SEQ Help and SEQ Happen; for each statement are shown in the tables in Appendix 7

6.23(3b) Preliminary Results of Factor Analysis

Unrotated principal components analysis was performed separately on each of the SEQ Help and SEQ Happen questionnaires. One hundred and seventy eight “pairs” of SEQs had been completed by people who had suffered a stroke within the previous 4 weeks. The 44 items for each of the SEQ Help and the SEQ Happen questionnaires were included in the analysis.

The Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO, an index for comparing magnitudes of the observed correlation co-efficients to the magnitudes of the partial correlation coefficients) was calculated. This gives an indication of whether the correlation between variables can be explained by the other variables. That is, if the KMO is small, factor analysis may not be valid. For this study it was found to be 0.76 for SEQ Help and 0.79 for SEQ Happen, which is described as "middling" (Kaiser, 1974).

Bartlett’s Test of Sphericity (SPSS, Professional Statistics 6.1, 1994) has been used to determine whether the correlation matrix is an identity matrix (*“all diagonal terms are 1* *and all off-diagonal terms are 0"*, SPSS, Professional Statistics 6.1, 1994). The value for the test statistic for sphericity (based on a chi-square transformation of the determinant of the correlation matrix) is 2,554 for SEQ Help and 2,300 for SEQ Happen (i.e. both are large) and are highly significant ($p < 0.001$). Therefore, it is unlikely that the population correlation matrix is an identity and it is therefore valid to use a factor model (SPSS Professional Statistics, 1994).

The strategy for extracting factors in this initial Principle Components analysis was to identify those factors with an Eigenvalue of >1 for both SEQ Help and SEQ Happen. The factors produced each have an associated variance. A plot of the total variance associated with each factor, called a scree plot (Cattell, 1978) shows a steep slope initially which represents the large factors and then this tails off rapidly as factors account for less and less of the variance. This pattern can be clearly seen in Figures 4 and 5 which are the scree plots for each of the SEQ Help and SEQ Happen questionnaires.

Figure 4 Scree plot demonstrating variance associated with the factors for SEQ Help

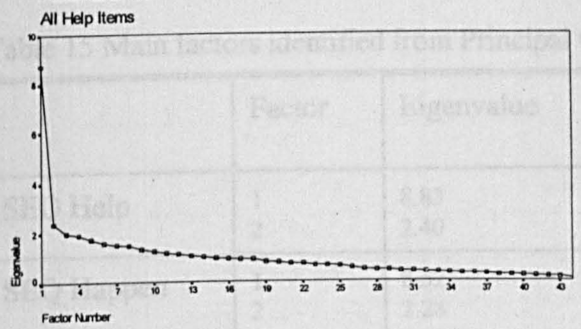
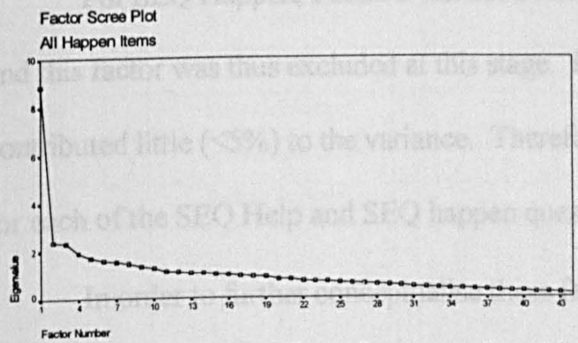


Figure 5 Scree plot demonstrating variance associated with the factors for SEQ Happen



As can be seen from the scree plots (shown in Figures 4 and 5 above) for both the SEQ Help and SEQ Happen analyses, after the first 2 factors the plots tail off more or less immediately. The proportions of variance accounted for are now discussed.

For the SEQ Help questionnaire, 14 factors (with Eigenvalues >1) were identified which accounted for 64.4% of the variance. Factor 1 accounted for 20.1% of the variance and Factor 2 accounted for 5.4%. Each of the remaining individual factors contributed little (<5%) to the variance (see Table 15 below).

For the SEQ Happen questionnaire, 13 factors (with Eigenvalues >1) were identified which accounted for 61.1% of the variance. Factor 1 accounted for 19.4% of the variance, Factor 2 for 5.2% and Factor 3 for 5.1%. The main factors, Eigenvalues and percentage of variance accounted for are shown in Table 15 below.

Table 15 Main factors identified from Principal Components analysis

	Factor	Eigenvalue	Percentage of Variance
SEQ Help	1 2	8.83 2.40	20.1 5.4
SEQ Happen	1 2 3	8.52 2.28 2.22	19.4 5.2 5.1

For SEQ Happen, Factor 3 did not contain any items which loaded more than 0.5 and this factor was thus excluded at this stage. Each of the remaining individual factors contributed little (<5%) to the variance. Therefore it would seem that there are 2 factors for each of the SEQ Help and SEQ happen questionnaires.

In order to further conceptualise these factors Varimax Rotation (SPSS, orthogonal) was performed selecting a 2 factor solution for each of SEQ Help and SEQ Happen. Items with a load of >=0.5 were identified and their relationship to each factor on each questionnaire is demonstrated in Tables 16 and 17 below.

In Tables 16 and 17 below each item number been identified by a short phrase to ease conceptualisation of the different factors for each of the SEQ Help and SEQ Happen items (for a complete listing of statements and item numbers see Appendix 4).

Table 16 SEQ Help - Concepts indicated following Varimax (Orthogonal) Rotation

Factor 1		Factor 2	
Item	Concept	Item	Concept
3	worthwhile person	11	accept thing
4	hopeful	14	remember younger
6	cheerful	18	whatever is meant
12	no matter what	23	die of something
16	trying hard		
17	do most things		
22	worthwhile to say		
27	seek opinions		
34	bodily functions		
35	suitable to live		
36	determination		
38	one step		
41	own decisions		
43	concentrate		
44	being myself		

Table 17 SEQ Happen - Concepts indicated following Varimax (Orthogonal) Rotation

Factor 1		Factor 2	
3	worthwhile person	5	home adapted
4	hopeful	23	die of something
6	cheerful		
12	no matter what		
16	trying hard		
17	do most things		
28	see, hear		
34	bodily functions		
35	suitable to live		
36	determination		
40	bills, laundry		
41	own decisions		
43	concentrate		

For Factor 1, many of the items for SEQ Help and SEQ Happen are very similar and it would seem that they represent a factor of Self-efficacy, Mental Competence and Determination. For Factor 2 however, the items are different for SEQ Help and SEQ Happen. SEQ Help is represented by items of Fate and remembering the past, whereas SEQ Happen is represented by Fate and having somewhere suitable to live. Though these factors have been identified, it is now necessary to determine whether each factor is robust. That is, is each internally consistent? The next section will describe this process.

6.23(3c) Preliminary Results of Internal Consistency

A preliminary factor structure has been established as described in the previous section and it is now necessary to examine the internal consistency of Factors 1 and 2 for each of the SEQ Help and SEQ Happen questionnaires. As previously stated in this chapter, it is important that the scale has adequate internal consistency (alpha >=0.70) and does not include items that ask the same question in different ways leading to an alpha that is too high (alpha >0.90).

The internal consistency, as measured by Cronbach's alpha (Cronbach, 1951) for each factor was then determined separately for each of the SEQ Help and SEQ Happen questionnaires. The results can be seen in Table 18 below. The number of items that contribute to each factor are indicated by N. For each analysis the results of 178 SEQs were included.

Table18 Internal consistency of each factor (Cronbach's Alpha)

	Factor 1		Factor 2	
	N	alpha	N	alpha
SEQ Help	15	0.88	4	0.64
SEQ Happen	13	0.85	2	0.35

Alpha for Factor 1 on both questionnaires is high and is within the desired limits. However, Factor 2 has low internal consistency (<0.70) and even if items were deleted, for SEQ Help or SEQ Happen, alpha would not be increased.

When all of these points are considered it would seem reasonable to consider a single factor solution.

6.23(4) Review of Principal Components Analysis

The iterative process previously described has resulted in a decision that the questionnaire is not in fact multi-dimensional but is uni-dimensional in nature. The internal consistency of the suggested single factor (Factor 1) for each of the SEQ Help and SEQ Happen questionnaires has been established.

It is now necessary to see if the questionnaires could be further shortened as this will facilitate administration of the questionnaires to the elderly in particular. It was still felt that it would be beneficial to have the same items for both SEQ Help and SEQ Happen, but without jeopardising the validity or internal consistency of the SEQs.

The principal components analysis was re-examined and items >=0.5 were identified for both SEQ Help and SEQ Happen questionnaires (see Table 19).

Table 19 SEQ Help and SEQ Happen items (>=0.05) in Factor 1 of the Principal Components Factor Analysis

SEQ Help		SEQ Happen	
Item	Concept	Item	Concept
3	worthwhile person	3	worthwhile person
4	hopeful	4	hopeful
6	cheerful	6	cheerful
12	no matter what	12	no matter what
		13	walk again
16	trying hard	16	trying hard
17	do most things	17	do most things
		20	family support
22	worthwhile to say	22	worthwhile to say
27	seek opinions	27	seek opinions
28	see, hear	28	see, hear
30	accept body		
31	luck		
33	day to day memory		
34	bodily functions	34	bodily functions
35	suitable to live	35	suitable to live
36	determination	36	determination
		41	own decisions
43	concentrate	43	concentrate
44	being myself	44	being myself

If one tried to represent all of the concept indicated here in either the SEQ Help and/or SEQ Happen questionnaires, a total of 20, out of the original 44, items would be necessary. That would necessitate patients answering 20 SEQ Help questions and 20 SEQ

Happen questions. That is, a total of 40 questions which is still an arduous task. It would be desirable to shorten the questionnaire further if this was possible.

In order to see if the questionnaires could be shortened further, correlation coefficients were calculated for the individual items for each of the Help and Happen items separately (see Appendix 8). Inter-item correlation coefficients of >0.5 were identified and items that could possibly be unnecessary were established. For example, as can be see in Table 20 below, for SEQ Help, items 3,4,6,43 and 44 were significantly correlated with each other.

Table 20 Items significantly correlated with each other for SEQ Help and for SEQ Happen

Help	Happen
Items (N=16)	Items (N=17)
3 or 4 or 6 or 43 or 44	3
6	4 or 12
12	6
16	12 or 34 or 4
17	13
22 or 27	16
28	17
30 or 44	20
31	22 or 27
33	28
35	34 or 35 or 12
36	35
43	36
44	41
	43
	44

Where items were significantly correlated with each other, they were considered for removal, but were left in place if they were necessary to represent concepts that were required for the other part of the SEQ.

Therefore the items needed to represent all concepts for either SEQ Help or SEQ Happen are:

3,4,6,12,13,16,17,22 or 27,28,31,34,35,36,41,43,44

In order to decide whether item 22 (worthwhile to say) or 27 (seek opinions) would be retained, the Cronbach's alpha analysis was re-examined for both Help and Happen questionnaires. The internal consistency (alpha) when Item Deleted (AID) for items 22 or 27 was examined. For Help, item 22 AID was 0.85 and for item 27 it was 0.86. For Happen, AID for items 22 and 27 were both 0.86. Therefore it was decided that item 22 would be retained. A further item (Item 35, I will have somewhere suitable to live) was removed as more than 90% of patients rated this as being very likely to happen indicating that it would not act as a very good discriminator. This resulted in 15 items being retained to form each of the SEQ Help and SEQ Happen questionnaires. A total of 30 items out of the original 88 will form the Stroke Expectations Questionnaire. The internal consistency for the resulting scale was then determined using Cronbach's alpha; for SEQ Help it was found to be 0.83, for SEQ Happen it was also found to be 0.83 and for both combined 0.89.

6.24 Discussion

This study has shown that when utilising factor analysis, a uni-dimensional scale could be identified with adequate internal consistency. The only robust factor identified in the context of this study was that of; self-determination, self-efficacy and competence. However, it must be acknowledged that in a much larger sample, a different factor structure may have emerged and their may have been more than one robust factor.

Furthermore, the items that did not load highly in this sample are not unimportant aspects of expectations (as they did come from a population of stroke sufferers originally) and the exclusion of these items at this stage may, in hindsight have been detrimental to the development of a useful scale.

Therefore, although this questionnaire has been pursued assuming a single factor, in future studies it may prove useful to give the original questionnaire in order to further elucidate any other possible robust dimensions.

Nevertheless, anecdotally, the factor identified and its dimensions seem unsurprising as these kinds of ideas are frequently cited by staff in the clinical situation as the rationale for some patients making little progress. Patients themselves often cite mental and physical competence as a pre-requisite for continuing to be a worthwhile person (e.g. patients interviewed, in the qualitative study reported in Chapter 5, reported "if I lose my marbles they may as well put me down" and "as long as me waterworks are all right"). Illness, whether chronic or acute offers a challenge to ones self-esteem and feelings of self-efficacy.

Previous research has shown that perceived self efficacy (or inefficacy) may influence response to recovery and rehabilitation, not just in physical terms, but in emotional and psychological areas as well (e.g. Partridge et al., 1989). Further, that each individual needs to feel they are an active participant in, and in control of their own management and care. Kearney and Fleisher (1979) have also suggested that those with high self-esteem and feelings of self efficacy will feel they are worthwhile whereas those with low self-esteem and self inefficacy may be unable to participate in the decision making process and feel unworthy of care.

Furthermore, Cohen (1959) has suggested that the coping mechanisms of those with high and low self-esteem may be different. The former may use denial and ignore conflicting messages, whilst the latter may use more expressive and projective defence mechanisms. For example, people with low self-esteem before they have a stroke, may experience even greater threats to self-esteem after the event.

Lazarus and Folkman (1984) have suggested that people, when questioned may indicate high self-esteem and self-efficacy, but behave as if they have low self-esteem and feel ineffectual. Therefore, it is very important to distinguish between general beliefs and expectations and those that may become apparent in a specific situation or under certain circumstances. The latter being a disposition carried to a particular situation by a person and the former being a cognitive appraisal.

Therefore in the context of this thesis it is important to determine if what people say they think will help them to get better and what they say they think will happen actually have an effect on outcome. For example, if they report that they think that being determined is the best way to get better and they believe that they will have determination, then does this affect their functional and emotional outcome? That is, you can not tell at the time if what people say they will do, and say how they will think, is what will actually happen in that situation. Therefore, the predictive validity of the scale must be determined.

When appraising the development of this scale it should be recognised that it was developed following the responses of a sub set of all stroke. That is those who were admitted to our hospital with a stroke and those who were able to respond. Only 35% of the total sample were included, despite trying to ensure that as many patients as possible were eligible. Unsurprisingly, the largest group excluded were the 119 (23%) with cognitive or communication problems. Though the majority of patients were assessed in the second week post-stroke, there were 50 patients who were discharged in weeks 1-3 post-stroke, but were included in the study because they returned to clinic within 4 weeks post-stroke. By including these people with potentially milder strokes and at a later stage, this could have led to the questionnaire being tested in a sample which was, overall, different than the population for whom it was intended in the future.

In addition, people with more severe strokes, may have been excluded because some, although found to be suitable for the study, had died before the researcher could obtain their study data.

Patients were generally identified prospectively, however, some patients (15%) were identified from hospital information systems post-discharge, and following case note review, were added to the stroke register retrospectively. As the Research Team was unaware of these patients during their hospital stay, it was not possible to consider these patients for inclusion. Patients identified retrospectively are generally either: those who are admitted in an unconscious state, die quickly and are subsequently labelled as having had a stroke or conversely, those people with such mild symptoms that their diagnosis is only made at or after discharge as a result of further tests (e.g. CT scan). Once again this may have made the study population different from those normally seen in clinical practice. Furthermore, it should be acknowledged that patients included in this study were those who had been admitted to hospital with their stroke in the acute stage. In Liverpool, it is estimated that approximately 20% of people who suffer a stroke are never admitted, this is in contrast to other centres, for example Oxford, where it was estimated that 50% remained in the community (Bamford et al., 1988).

A general factor emerged for both SEQ Help and SEQ Happen which suggests that patients believe that determination, mental competence and self-efficacy are important in order to help them to get better and also that to have these competencies is what they hope for in the future. In terms of face validity, this would seem to support previous work which have identified motivation and feelings of self-efficacy as instrumental in effective coping with (e.g. Cohen and Lazarus, 1973; Bandura, 1977; Brothen and Detzner, 1983) and recovery from physical illness (e.g. Dakof and Mendelsohn, 1986; Dakof and Mendelsohn, 1989). The SEQ's predictive validity, its relationship to patient outcomes, test re-test reliability and the possibility that mood may confound results requires further investigation.

This study used factor analysis to identify correlations between the items on the SEQ in relation to the answers to both Help and Happen questions, to identify the most important variables and the underlying constructs and to allow simplification of the questionnaires. That is, to determine what construct or constructs could account for the way in which individuals responded to the SEQ items and which items of the questionnaire would be the best at reflecting this construct (or these constructs).

The number of Eigenvalues which are greater than one thus represents the number of factors necessary to explain the majority of the variance. Those with Eigenvalues less than one explain very little of the variance. In this study, even though there were several factors with Eigenvalues of greater than one, the actual amount of variance explained by each of these factors was small. It transpired that there was one robust factor. A uni-dimensional scale was therefore suggested (even though it only accounted for approximately 20% of the variance). The internal consistency (as determined by Cronbach's alpha) was good.

One of the main criticisms of questionnaire development has been that researchers have put together a list of questions, obtained a total score, estimated the internal consistency of the results, but have failed to first establish whether the scale was uni-dimensional. That is, whether it was appropriate to add together all of the items. It may be that the questionnaire was in fact multi-dimensional and it may only have been appropriate to add together items in each separate dimension. Therefore, it was decided to use factor analysis to establish multi or uni-dimensionality.

However, one of the main criticisms of factor analysis is that the results are only as good as the information that is put in. Therefore, it was important to have a broad sample of variables from a wide range of sources so that an important variable was not excluded. This was why, when performing content analysis on patient interviews in the original development of the test (Chapter 5), that the broadest range of themes was included (some may have only been indicated by one person). Also, these patient themes were supplemented by those derived from literature review and from discussion with stroke experts.

However, by including themes that may have only been mentioned by one person in the qualitative study (Chapter 5), as has been suggested previously, erroneous questions or domains have been included and this too can introduce error, as these items would discriminate between patients in a domain that was not related to the purpose of the questionnaire. However, the number of subjects in the qualitative study was relatively small (17 patients) and it was felt that, on the face of it, that an item mentioned by only one person in the qualitative study would have been mentioned more than once if many patients had been surveyed.

Furthermore, factor analysis should also result in the removal of items that are erroneous or mentioned by but a few people. The item loadings in such cases would be low and would therefore not been identified as part of a factor. In terms of internal consistency, if alpha had been low (=<0.70) or when particular items were deleted alpha was not reduced then this too would have alerted the researcher to the possibility that erroneous items had been included.

The number of items in the questionnaires was relatively large, and in comparison, the number of subjects tested was relatively small. The sampling adequacy was suggested to be acceptable but "middling". It may be that had a much larger sample been used to test the original questionnaire, then the factor structure may have been quite different and more than one robust factor may have emerged. From this point forward the comparison between expectations and outcome will be made by using only a limited amount of the total information derived from the patient themselves. In future studies it may be better to use the original longer version of the questionnaire in order to increase the amount of available data on the way that patients respond to all 44 items from each of the 2 Help and Happen aspects.

6.25 Conclusion

In conclusion, a scale has been developed that measures broad expectations of recovery in terms of what stroke sufferers, who have been admitted to hospital at the acute stage, think will help and what they think will happen to them in the future. The domains investigated were suggested by those who had themselves suffered a stroke. The structure of the questionnaire was determined using information supplied by a sample of stroke sufferers themselves who had agreed to complete the questionnaires in the early stages after suffering a stroke. Furthermore, even in its original lengthy format, people who had recently suffered a stroke were able to complete the questionnaire. It can be concluded that this scale has broad applicability and utility and is appropriate for use in this client group. However, it must also be acknowledged that, as with previous studies (e.g. Robinson et al., 1984a; 1984b; 1984c; House et al., 1991) those with severe cognitive and communication problems were excluded. The results of this study can therefore not be generalised to the stroke population as a whole.

In the following chapter the main study of the thesis will be detailed. It needs to determine whether patient's scores on the SEQ Help and SEQ Happen questionnaires are predictive of outcome in terms of physical function and emotional distress. That is, to determine the SEQ 's predictive validity. The possibility that mood and severity of stroke may alter the way patient's respond to the SEQs needs to be investigated as well as the possibility that these variables alone may predict outcome. We need to establish whether answers to the SEQ are predictive of outcome above and beyond information that could be obtained by measuring depression and stroke severity. That is, does the development of the SEQ add to current knowledge about recovery from stroke and response to rehabilitation?

Chapter 7

Main Study Design

The previous chapter described some of the psychometric properties of a questionnaire, designed specifically for the research thesis, and which assesses what patients think will help and what they think will happen in the course of their stroke rehabilitation. This chapter will now focus on the main study in the thesis. The main study will be set in the context of stroke services and research at Aintree and the broader scope of the research thesis itself. The aims and hypotheses will be described, the instruments used will be expanded upon, the schedule of testing and follow up will be detailed and the cross-sectional and longitudinal aspects of the study together with their rationale will be explained and elucidated.

The main study for the thesis was in itself part of a larger piece of research which examined patients', physiotherapists' and carers' ideas about what they think will help recovery and what will happen in the future. Consequently, a wide variety of very detailed data are available on the patients included in the main study. In the interest of clarity it was decided that the thesis should restrict itself solely to the consideration of patients' expectations and outcomes.

7.1 Aims

The thesis aims to identify patients' beliefs and "expectations" about recovery from stroke using the Stroke Expectations Questionnaires and to establish whether patients' expectations influence the response to rehabilitation in terms of functional and emotional outcome. Those with significant pre-stroke handicap will be compared to those who did not have significant pre-stroke handicap.

7.2 Hypotheses

Expectations influence response to rehabilitation;

1) Those with more optimistic attitudes (i.e. where "Help" scores are high, where "Happen" scores are high, or where Help is higher than Happen) will be less disabled and/or less likely to be depressed or anxious at 3 months post-stroke.
2) Those with more pessimistic attitudes (i.e. where "Help" scores are lower, where "Happen" scores are lower, or where the difference between Help and Happen scores is positive) will be more disabled and/or more likely to be depressed or anxious at 3 months post-stroke.
3) Those with previous experience of disability will be more optimistic and will thus be less disabled and/or more likely to be depressed or anxious at 3 months post-stroke than those with no previous experience.

7.3 Design

The study was performed in parallel to an ongoing program of research at Aintree Stroke Unit which is facilitated by an accurate stroke register and data collection schedule performed on all patients admitted with an acute stroke and also those who suffer a stroke following admission to hospital. A research assistant is 'on call' 24 hours a day and is notified of all stroke admissions by casualty and ward staff. The stroke register is constantly updated and checked by retrospective identification of stroke patients identified through the hospital information system using International Classification of Diseases coding (ICD codes) and casenote review. A minimum dataset, in the European Stroke Database format (Ellul, 1998) is collected, where basic demographic details are recorded in addition to; detailed information about stroke severity and sub-type, the timing and results of stroke specific investigations and treatments, the length of stay in acute and rehabilitation care and some basic details of functional and cognitive problems; pre-stroke, on admission, Day 7, transfer from acute care to rehabilitation and at discharge from hospital (for proforma see Appendix 9). In parallel to the main study for this thesis, a discharge planning audit was being performed on all stroke patients admitted to Aintree between January and June 1996. For this project, the usual minimum dataset was collected during the hospital stay, but all patients had a more detailed assessment at discharge and were followed up in the community at 3, 6 and 12 months post-stroke and will also be followed up at 24 months in 1998. The main focus of this audit was to assess communication across the hospital-community interface and then examine the timeliness and targeting of post-discharge interventions by health and social services.

The main study for the thesis was in itself a larger piece of research which examined patients', physiotherapists' and carers' ideas about what they thought will help recovery and what will happen in the future (a schedule of assessments for the whole study is contained in Appendix 10)

There were both cross-sectional and longitudinal aspects to the study. In the former each patient was examined using an assessment battery between 1 and 4 weeks post-stroke, and in the latter the initial assessment battery was compared to the results of a similar battery of assessments performed at 3 months post-stroke.

7.4 Methods

7.41 Subjects and Sampling

All patients admitted to the District General Hospital with a primary diagnosis of an acute stroke (WHO definition) between January and November 1996 were registered (as described previous in section 6.23(2a)) and were considered for inclusion in the study. All patients underwent a detailed physical examination and a differential diagnosis was formed.

7.42 Assessments

The assessment battery consisted of screening and assessment. The screening was performed by one of three Stroke Research Nurses (MMSE, FAST and consent) and the assessment (an outline of which is provided in Appendix 10) was performed by one of three Psychologists. The assessments and the procedures for the study will now be described and discussed. Those who were too ill, were unable or unwilling to consent and those with severe communication or cognitive problems (according to the MMSE and FAST) were not included.

7.42(1) Mini Mental State Examination

The Mini Mental State Examination (MMSE) (Folstein et al., 1975) was used in this study to screen for cognitive problems as described in Section 6.23(2b). However, as previously described, because some patients were unable to complete some parts of this test , in the opinion of the researcher, purely because of an impairment caused by the stroke itself, scores were pro-rated on some items (if the dominant arm or speech was affected). The raw score without pro-rating was noted. This issue will be discussed further in Section 8.4.

7.42(2) Frenchay Aphasia Screening Test

The Frenchay Aphasia Screening Test (FAST) was used in this study to screen for communication problems as described in Section 6.23(2b).

7.42(3) Measuring Disability and Handicap

Barthel Activities of Daily Living Index

The Barthel Index (Mahoney and Barthel, 1965; Wade and Collins, 1988) and some of its limitations have been previously described in Section 3.3.

Modified Rankin Score

The Rankin Score was devised to measure handicap (Rankin, 1957). Handicap has been defined as:

"a disadvantage for a given individual, resulting from impairment or disability, that limits or prevents the fulfillment of a role that is normal (depending upon age, sex, and social and cultural factors) for that individual" (WHO, 1980).

Handicap thus does not just refer to loss of function but relates more to quality of life and restriction of social roles. It has 6 grades indicating degrees of handicap which are shown in the Table 21 below.

Table 21 Rankin Grade and Description

Grade	Description
0	Well, no symptoms
1	Minor symptoms, not affecting lifestyle
2	Minor handicap, but independent in selfcare
3	Moderate handicap, needing a little help with ADL
4	Needing a lot of help with ADL
5	Needing constant attention day and night

The Rankin has been criticised as it mixes impairments, disabilities and handicaps, as well as mixing objective with subjective items (Ebrahim et al., 1990). Nevertheless, the Rankin has been shown to be both reliable and valid (Bonita and Beaglehole, 1988) and it has been suggested by Wade and Collins (1988) that it useful as a simple outcome measure for large trials. In the context of this large study it was felt that it would be useful to indicate pre-stroke handicap, as it was important not only to know if people had had a previous stroke, but also to give an indication if the resultant disability had affected the person's lifestyle. This was felt to be important because patients with pre-stroke handicap would have had previous experience of living and coping with handicap. It was decided that for the purposes of the present study those with a pre-stroke Rankin of less than 2 (i.e. scoring 0 or 1) would be classed as "without significant pre-stroke handicap" and those with a pre-stroke Rankin of greater than 1 (i.e. scoring 2,3,4 or 5) would be classed as "with significant pre-stroke handicap".

7.42(4) Screening for Depression

For this study it was decided to use a combination of a clinician rating scale (Montgomery Asberg Depression Rating Scale) and a self-reported measure (the scaled version of the General Health Questionnaire (GHQ 28)) The rationale for this has previously been discussed (see Section 2.41). The GHQ 28 includes a subscale measuring aspects of social dysfunction which, Ebrahim (1990) feels may skew scores in stroke patients. For this study a comparison will be made between the conventional scoring and the scoring suggested by Ebrahim (1990) where the contribution of social dysfunction subscale is partialed out.

7.42(5) Stroke Expectations Questionnaires

The SEQs (Help and Happen) are two 15 item questionnaires which were developed specifically for this thesis. Each of the fifteen items are scored on a 5 point Likert scale from 1-5 ("not at all" - "a great deal"). Therefore, for each questionnaire, the minimum possible score is 15 and the maximum is 75. They each measure broad expectations of recovery in terms of what stroke sufferers think will help (SEQ Help) and what they think will happen to them in the future (SEQ Happen). It would seem that the SEQs reflect the perceived requirement for and the desire for; determination, mental competence and self-efficacy in stroke sufferers. The SEQ's predictive validity, its relationship to patient outcomes and the possibility that mood may confound results requires further investigation and this is the subject of this study.

7.43 Procedure

Each patient was provided with an information sheet (see Appendix 11) explaining the purpose of the study. The patient (or their relative if they were unable to) signed a consent form (see Appendix 11). They were reassured that all information provided would be kept strictly confidential and that they could withdraw from the study (without having to give a reason) at any time and that this would not affect their future care or treatment in any way.

The MMSE and FAST were performed by the Research Nurses and those without severe cognitive and/or communication problems were excluded at this point. Those patients who were to be excluded were debriefed.

In those who were found to be suitable for the study, the format of the questionnaires was explained and the patients were interviewed by the researcher and their previous and current handicap (as measured by the Rankin) were noted. The patients were asked to rate the global prediction score for how they thought they would be in 3 months time and the researcher noted whether they had indicated better, same or worse. The patients were instructed to complete the SEQ Help, SEQ Happen and the General Health Questionnaire 28 (GHQ 28). If the patients could not manage to complete the SEQ or the GHQ 28 by themselves (due to visual field or limb weakness problems) then the researcher read them each question and completed their response on the 5 point Likert scale for the SEQs and on the four point scale for the GHQ 28. On completion of these questionnaires, a clinical interview was performed by the researcher (an experienced psychologist) to determine whether the patient had depression according to DSM IV criteria (see Chapter 2, this volume) and the researcher rated the Montgomery Asberg Depression Rating Scale (MADRS). Following the interview the patients were debriefed and were reminded that the researcher would return to see them at a later date. The Barthel had been rated by the ward staff at Day 7 post-stroke.

The patient was contacted at 3 months post-stroke and was reminded about agreeing to participate in the study. The test battery was repeated (Rankin, Barthel, SEQ Help, SEQ Happen, MADRS, GHQ 28 and Global Prediction) at 3 months post-stroke once verbal consent was given. If the patient had been discharged before 3 months an appointment was made at a mutually suitable time and the interview took place in the patient's residence. The place of residence and whether living alone or with companion was noted and whether the patient had been prescribed anti-depressant drugs since the stroke and if they were still on treatment.

7.44 Ethical Considerations and Confidentiality

Ethical approval was obtained (for copy of approval letter, see Appendix 12) and the normal safeguards of the Data Protection Act (1984) were applied (patients were not be directly identifiable from information held on computer). An information sheet (Appendix 11) was given to each patient and permission asked before interviews took place. All patients were reassured that all the information provided was confidential and that they would not be identified either directly or indirectly in any publications.

Chapter 8

Results - Patient Characteristics and Initial Assessment

This chapter will concentrate on describing the characteristics of patients included and excluded from the study. For those who entered into the study, their baseline characteristics; basic demographic details, type and severity of stroke, functional status at Day 7 and emotional and psychological status at initial (week 2) assessment will be examined. The numbers of patients with and without significant pre-stroke handicap will be identified. As previously discussed, those who have experience of living with restrictions to their lifestyle may experience a stroke differently to those who have no prior experience of disability and its resultant effect on lifestyle. Those who have experienced physical gains or losses in the past may cope differently with and adjust differently to stroke illness. Those with comorbid conditions are more likely to suffer a recurrent stroke (Gresham et al., 1979) and these conditions may compromise their participation in rehabilitation activities (e.g. arthritis, heart failure, ischaemic heart disease). Therefore, these two groups of patients will be compared throughout the analysis. The implications for the findings will be discussed.

Of the 511 patients admitted between January and November 1996, 128 patients (25%) were included in this study. Table 22 below shows the reasons for non-inclusion.

Table 22 Reasons for non-inclusion in the study

Reason for non-inclusion	**Frequency (%)**
Severe cognitive (N=23)/ communication problems (N=96)	119 (23)
Discharged/Died week 1	131 (26)
Died/Discharged before inclusion	31 (6)
Too ill/Unable to consent	23 (5)
Refused	3 (<1)
Follow up not possible	1 (<1)
Retrospectively identified	75 (15)

Patients without speech problems (dysarthria or dysphasia) but having cognitive problems were classified as having severe cognitive problems, whilst those with severe communication problems where the assessment of cognition was impossible, were classified as having communication problems.

Patients were generally identified prospectively, however, some patients (15%) were identified from hospital information systems post discharge, and following casenote review, were added to the stroke register retrospectively, as previously described. As the research team was unaware of these patients during their hospital stay, it was not possible to consider these patients for inclusion.

One of the major criticisms of previous stroke studies has been sampling bias, as those with aphasia or cognitive problems have been automatically excluded. In this study, despite trying to ensure that as many patients as possible were included, 119 (23%) were excluded due to cognitive or communication problems.

One patient was known to be moving out of the area and it would not be possible to follow them up. A further 23 patients were either too ill or were unable to consent in the second week post-stoke. There were 131 patients who were not considered for inclusion as they either died or were discharged in week 1 post-stroke and 31 patients who were screened, found suitable for the study, either died or were discharged before the researcher could perform their baseline assessment. Of these 162 patients, 50 were subsequently recruited into the sample used for the development of the questionnaire described in Section 6.23. Comparisons between these 50 patients and the 128 patients included in the predictions study are shown in Table 23 below.

Table 23 Comparison of those patients included in the Main study (128) and additional patients recruited for the 'development' of the questionnaire (50)

Variable		All patients N=178	Main N=128	Development N=50	p value *
Mean Age (SD)		70.6 (10.0)	71.1 (9.6)	69.4 (11.0)	NS*
No.of Females (%)		79 (44)	61(48)	18 (36)	NS**
No. with Previous stroke (%)		44 (25)	32 (25)	12 (24)	NS**
Side (number in each category)	left (%)	100 (56)	70 (55)	30 (60)	NS**
	right(%)	60 (34)	46 (36)	14 (28)	NS**
	neither (%)	13 (7)	10 (8)	5 (10)	NS***
	both (%)	4 (3)	2 (1)	1 (2)	NS***

* = comparison using independent sample t-test,
** = comparison using Chi-square,
*** = comparison using Fisher's Exact
NS = p>0.05

There were no significant differences between the above characteristics of the sample used for the Main study and the additional patients included for the development of the questionnaire. All 128 patients included in the Main study, had been judged to have no severe cognitive or communication problems according to MMSE. As physical problems may reduce the number of items able to be answered in written or verbal formats a strategy of pro-rating items on the MMSE was used (this has been previously discussed in Chapter 6). One hundred and three patients had a score of 23 or more on the MMSE, those scoring less than 23 would normally be considered to have cognitive impairment. The MMSE scores for the 25 patients scoring less than 23 are shown in Table 24 below.

Table 24 MMSE sub-scale scores for those with total score <23

Reg. No.	Orientation (10)	Registration (3)	Attention & Calculation (5)	Recall (3)	Language (9)	MMSE Total (30)	Speech problem	Weakness dominant side
569	3	3	0	0	5	11	Y	N
620	10	3	0	2	7	22	N	Y
625	4	3	0	3	4	14	Y	N
635	5	3	0	2	5	15	Y	N
651	6	3	1	1	6	17	N	Y
660	7	3	3	3	4	20	Y	N
674	9	3	5	3	2	22	Y	N
684	0	3	5	0	7	15	N	Y
691	7	3	4	2	3	19	N	Y
692	5	3	2	3	8	21	Y	N
717	3	3	1	0	8	15	Y	N
733	3	3	2	1	7	16	Y	N
743	5	3	2	1	8	19	Y	N
754	10	3	5	2	0	20	Y	N
757	4	3	4	3	7	21	N	Y
758	5	3	3	2	9	22	N	N
765	9	3	4	2	3	21	N	Y
772	5	3	2	1	8	19	N	Y
826	8	3	3	0	8	22	Y	N
852	6	3	3	0	9	21	N	Y
878	6	3	2	0	6	17	Y	Y
879	5	3	4	3	7	22	Y	N
974	2	3	4	0	6	15	Y	N
1004	9	3	0	2	8	22	Y	N
1010	4	3	0	2	6	15	Y	N

The total score possible for each sub-scale is shown in brackets. Reg. No. is the unique identifier for this patient on the hospital's stroke register.

Those patients whose writing arm was affected, i.e. limb weakness on the dominant side are indicated by darker highlighting and those with speech problems are indicated by the lighter highlighting. As can be seen from Table 24, all patients scoring less than 23 on the MMSE had either speech or writing arm weakness. Therefore, if the stance of pro-rating items is taken, then all patients would meet the required MMSE score and would subsequently be included.

It will be shown later, in Section 8.41, that those patients who had had these particular items pro-rated did not score any differently on the Stroke Expectations questionnaire than those who had achieved the desired MMSE total without pro-rating.

8.1 Demographic Details at Week 2

The demographic details of the whole sample can be seen in Table 25 below, together with a breakdown for patients with (pre-stroke Rankin >1) and without (pre-stroke Rankin <2) significant pre-stroke handicap. Where comparisons will be made using non-parametric statistical tests, medians and inter-quartile ranges (IQRs) will be quoted, where comparisons will be made using parametric tests means and standard deviations (SD) will be quoted.

In order to test the hypothesis that the age data for those with and without pre-stroke handicap were from normal distributions, Lilliefor's tests (modification of the Kolmogorv-Smirnov test, SPSS, 1993) were performed. Both were found to be significant (Rankin >1; statistic=0.08, p >0.2, Rankin <2; statistic=0.05, p >0.2) and would suggest that we should accept the hypothesis that the age data for both groups were normally distributed. When compared using independent samples t-tests, those with previous handicap were significantly older (mean age 76, SD 8.9, range 60-91; p <0.007) than those without previous handicap (mean age 70, SD 9.5, range 44-89) and were more likely (52% vs 18%) to have had a previous stroke (p <0.03). Though there are a smaller proportion of females in the group with previous handicap this difference was non-significant when examined using chi-square.

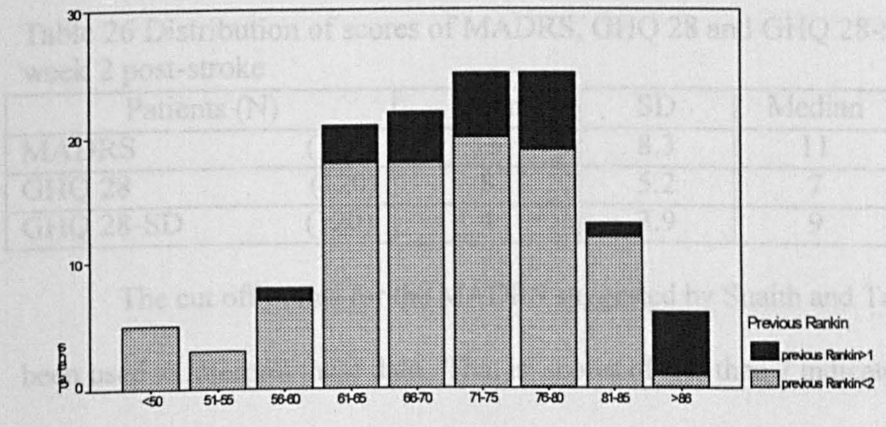
Those with left sided weakness from this stroke were less likely to have had previous disability, whilst those with right sided weakness were more likely to have had previous disability. This issue will be examined further, should a difference in expectations be apparent between those with and without pre-stroke handicap.

Table 25 Comparison of those with and without previous handicap

Variable		All patients N=128	Rankin <2 N=103	Rankin >1 N=25	p value *
Mean Age (SD)		71 (9.6)	70(9.5)	76 (8.9)	0.007*
No.of Females (%)		61(48)	49 (48)	12 (48)	NS**
No. with Previous stroke (%)		32 (25)	19 (18)	13 (52)	0.002**
Side (number in each category)	left (%)	70 (55)	63 (61)	7 (28)	0.006**
	right(%)	46 (36)	31 (30)	15 (60)	0.01**
	neither (%)	10 (8)	8 (8)	2 (8)	NS***
	both (%)	2 (1)	1 (1)	1 (4)	NS***

* = comparison using independent sample t-test,
** = comparison using Chi-square,
*** = comparison using Fisher's Exact
NS = p>0.05

Figure 6 Comparison of age groupings in those with and without pre-stroke handicap



When one looks at Figure 6 above, it can be seen that in those patients 55 years and younger none had significant pre-stroke handicap, whereas the majority of those over the age of 85 had significant pre-stroke handicap.

8.2 Depression at Week 2

Both self-report (GHQ 28) and clinical assessments (MADRS) were used to identify depressive symptoms and more severe depression at week 2, their measures of central tendency and descriptive statistics are shown in Table 26 below. GHQ 28 scores, when the social dysfunction subscale scores are removed from the total GHQ 28 score are also shown. The GHQ 28 without the social dysfunction scores will be referred to as GHQ 28-SD. The differences between the three scales will be compared and contrasted as we proceed through the analysis. Total scores are available for all assessments where each item of the scale has been completed, otherwise, the total scores for these patients will be counted as missing. For example, in Table 26 below, total MADRS scores were available for 108 patients, whereas total GHQ 28 and GHQ 28-SD scores available for 120 patients. Items could have failed to have been scored for a variety of reasons, e.g. refused, not recorded on the sheet or recording unclear.

Table 26 Distribution of scores of MADRS, GHQ 28 and GHQ 28-SD for all patients at week 2 post-stroke

Patients (N)	Mean	SD	Median	Range	IQR
MADRS (108)	13	8.3	11	0-38	7-17
GHQ 28 (120)	8	5.2	7	0-25	3-10
GHQ 28-SD (120)	4	3.9	9	0-16	0-6

The cut off points for the MADRS suggested by Snaith and Taylor (1985) have been used to interpret these data. That is; scores of less than 7 indicate “no depression”, 7-19 “mild depression”, 20-34 “moderate” and 35 and above “severe depression”. The cut-off point for the GHQ 28 is suggested to be 4/5 (Goldberg, 1978), and therefore those with a GHQ 28 of <5 have been classified as not depressed. Comparison of the numbers of subjects who were identified as depressed by the MADRS classifications and GHQ 28 classifications are shown in Table 27.

Table 27 Comparison of numbers of subjects identified as depressed according to the MADRS, GHQ 28 and GHQ 28-SD for all patients at week 2 post-stroke

		MADRS (N=108)				
GHQ Scoring		No	Mild	Moderate	Severe	Total
GHQ 28	Not depressed (score <5)	12	18	0	0	30
	Depressed	11	44	18	4	77
	Total	23	62	18	4	107
GHQ 28-SD	Not depressed (score <5)	20	36	2	0	58
	Depressed	3	26	17	4	50
	Total	23	62	19	4	108

In Table 27, 107 GHQ 28 scores were available, though 108 GHQ 28-SD scores were available, as only 3 subscales are required to give a total score. Thus for 1 patient an item from the social dysfunction subscale was missing which meant that it was not possible to obtain a GHQ 28 total score, but it was possible to obtain a GHQ 28-SD total score.

As can be seen from Table 27, 72% of patients would be classified as depressed according to the GHQ 28, and 79% of patients would be classified as depressed according to the MADRS. The majority of patients are classified as depressed when using either scale. However, the GHQ 28-SD classifies only 46% as depressed.

In order to compare the depression scores of those with and without pre-stroke handicap it would be desirable to use parametric tests, therefore we must first establish whether the GHQ 28 and MADRS scores are approximately normally distributed. As can be seen from the Normal Probability Plots for the MADRS (Figure 7) and the

GHQ 28 (Figure 8) the points cluster around the straight line indicating that the data resemble normality. Therefore, all future analyses will use parametric tests when appropriate.

Figure 7

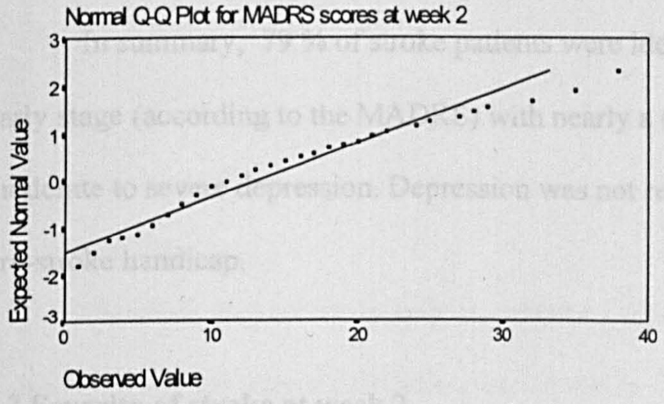
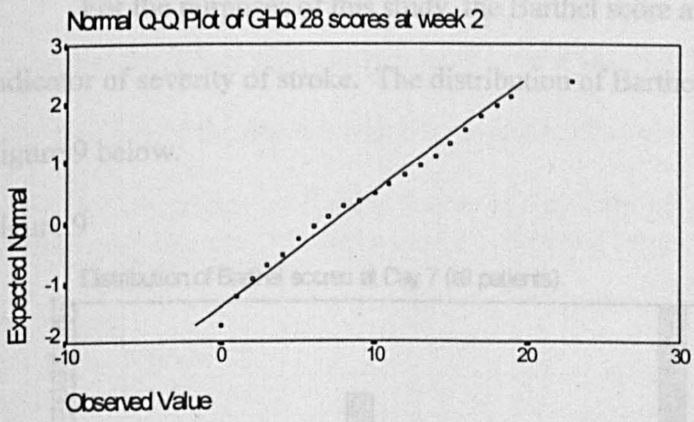


Figure 8



When the raw scores of the GHQ 28 and MADRS were compared overall there were no significant differences between those with (pre-stroke Rankin >1) and without (pre-stroke Rankin <2) pre-stroke handicap in relation to depressive symptoms as defined by GHQ 28 (t-test, t= -0.80, p=0.42) and MADRS scores (t-test, t= -0.73, p=0.47). When comparing the two groups' GHQ 28 sub-scale scores, there was also no significant differences (p>0.05).

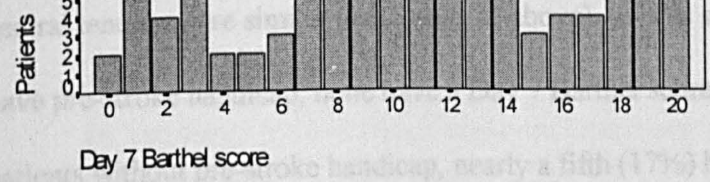
The fact that those people with pre-existing handicap do not report (more than those who did not have pre-stroke handicap) physiological symptoms may support the idea that the GHQ 28 fails to detect somatic complaints in this client group as people are asked to describe symptoms that are "different from usual".

In summary, 79 % of stroke patients were identified as being depressed at this early stage (according to the MADRS) with nearly a third (27%) of these people having moderate to severe depression. Depression was not related to presence or absence of pre-stroke handicap.

8.3 Severity of stroke at week 2

For the purposes of this study, the Barthel score at Day 7 has been taken as an indicator of severity of stroke. The distribution of Barthel scores at Day 7 is shown in Figure 9 below.

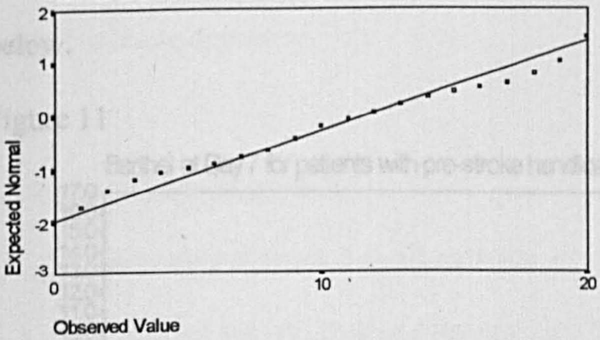
Figure 9



In order to test the hypothesis that the data were from a normal distribution, a normal probability plot was produced.

The plot is shown in Figure 10 below and shows clearly that the points cluster around the straight line and the data resemble normality.

Figure 10 Normal Probability Plot of Barthel scores at day 7



Therefore, Barthel scores will be compared later using parametric statistics and therefore means and standard deviations are shown in Table 28 below. Other measures of central tendency and spread are shown in Table 28 below, the clustering of Barthel scores around the maximum (25% have a score greater than 17, 13% with 20) demonstrates the ceiling effects of the Barthel which have previously been mentioned.

Table 28 Comparison of Barthel scores at Day 7 for all patients, and separately for those patients with (Rankin >1) and without pre-stroke handicap (Rankin <2)

Patients	N	Mean	SD
All patients	128	12	6.0
Pre-stroke Rankin <2	103	12	6.2
Pre-stroke Rankin > 1	25	12	4.7

When comparing patients with and without pre-stroke handicap, measures of central tendency are similar (see Table 28 above). In this study, for those patients who did have pre-stroke handicap, none have a Day 7 Barthel score of 0 or 20. However, in patients without pre-stroke handicap, nearly a fifth (17%) have achieved the maximum score of 20 by Day 7. However, when Day 7 Barthel scores are compared, for those with or without significant pre-stroke handicap, no statistically significant difference was demonstrated (independent sample t-test, t=-0.07, p=0.94). That is, those with significant pre-stroke handicap did not have more severe strokes. The distribution of scores for those with and without pre-stroke handicap can be seen in Figures 11 and 12 below.

Figure 11

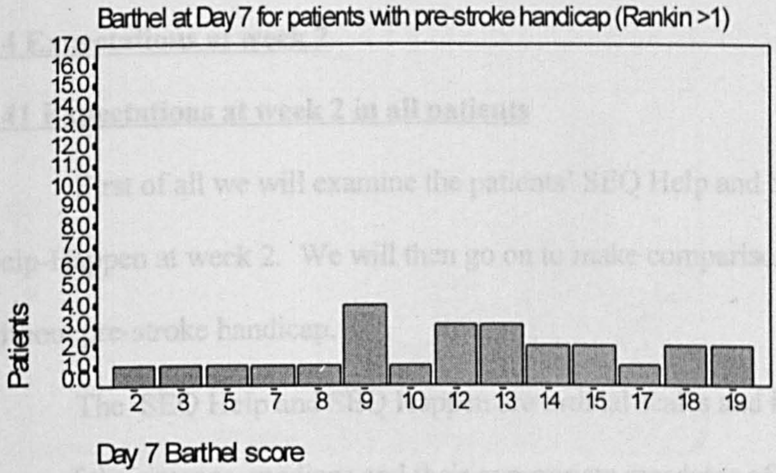
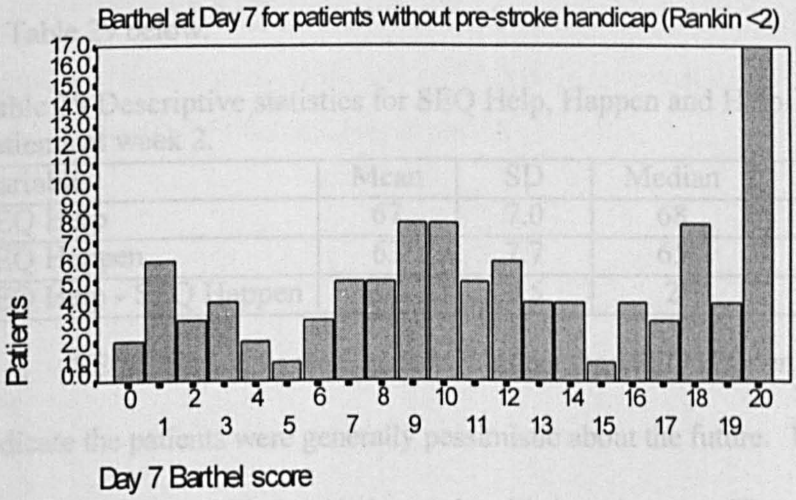


Figure 12



In summary, 87% of patients required assistance with some Activities of Daily Living (ADLs) at Day 7 post-stroke and 57 (45%) require assistance with all 10 ADLs that are identified by the Barthel score. Those with significant pre-stroke handicap did not appear to have had more severe strokes. We will now go on to examine what people thought would help them to get better and what they thought was going to happen. We wish to see if those with more severe strokes or those with previous experience of handicap differ in their views about the future and to determine whether these views are related to being depressed.

8.4 Expectations at week 2

8.41 Expectations at week 2 in all patients

First of all we will examine the patients' SEQ Help and SEQ Happen and SEQ Help-Happen at week 2. We will then go on to make comparisons between those with and without pre-stroke handicap.

The SEQ Help and SEQ Happen are ordinal scales and have been described in terms of their means, medians and their appropriate measures of dispersion and are shown in Table 29 below.

Table 29 Descriptive statistics for SEQ Help, Happen and Help-Happen scores for all patients at week 2.

Variable	Mean	SD	Median	Range	IQR
SEQ Help	67	7.0	68	40-75	63-71
SEQ Happen	63	7.7	65	44-75	58-69
SEQ Help - SEQ Happen	3.1	7.5	2	-23-26	0-7

SEQ Help scores were generally higher than SEQ Happen scores and this may indicate the patients were generally pessimistic about the future. That is, what they thought ideally was likely to help was less likely to happen. Though the minimum score was 15 no patient scored this low on either SEQ Help or SEQ Happen, with the reported minimum scores being 40 and 44 respectively at this week 2 stage, 25% of patients scoring 71 or more on SEQ Help and 69 or more on SEQ Happen.

In order to decide whether non-parametric or parametric statistical tests will be suitable for making comparisons it must be demonstrated that SEQ Help and SEQ Happen scores are approximately normally distributed. The histogram in Figure 13 below demonstrates that the data for SEQ Help questionnaires are negatively skewed, with several patients scoring less than 55 on the SEQ Help questionnaire at week 2.

Figure 13 Histogram showing the distribution of SEQ Help scores at week 2

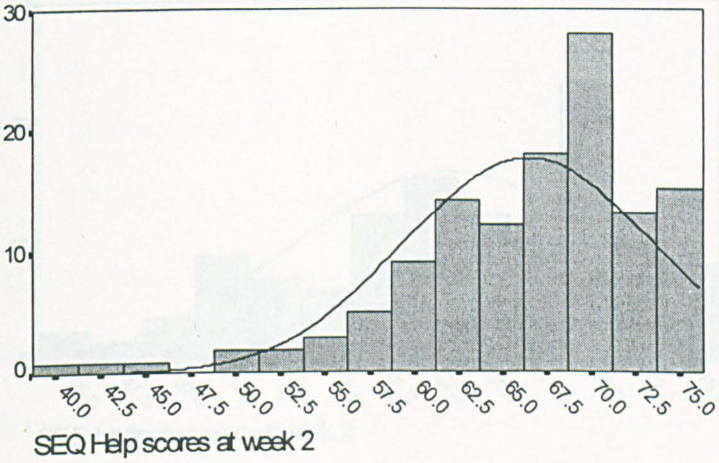
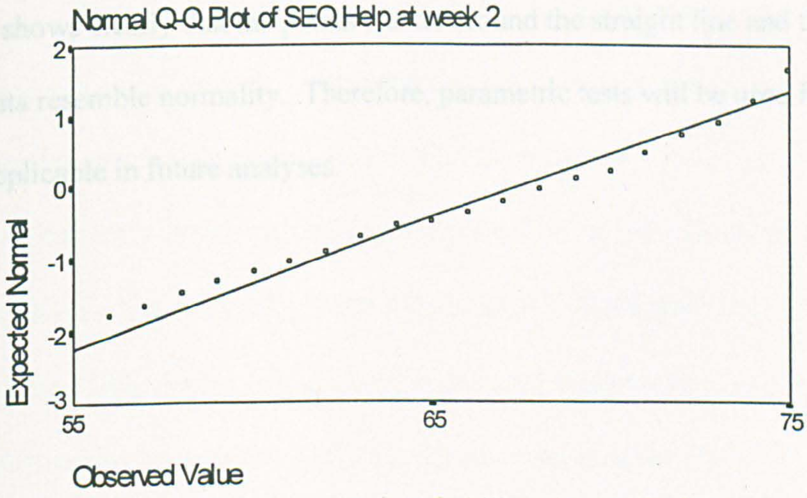


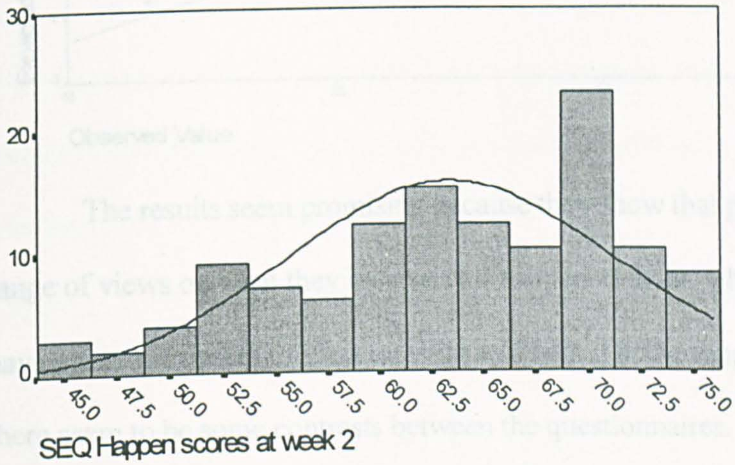
Figure 14 Normal probability plot of SEQ Help scores at week 2



Further, when the normal probability plot or “Q-Q”plot (see Figure 14 above) is examined it shows clearly that the points cluster around the straight line and that the distribution of data resemble normality. Therefore, parametric tests will be used for comparisons where applicable in future analyses.

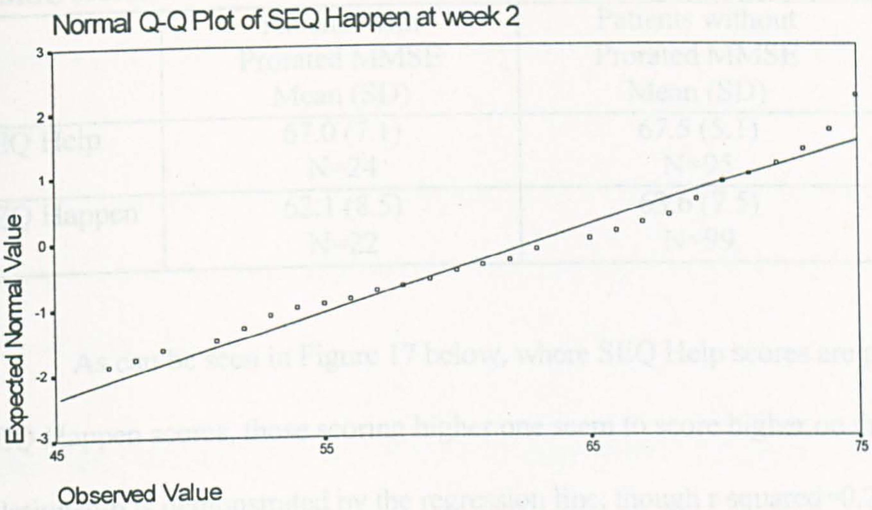
This process must now be repeated for the SEQ Happen questionnaires. The histogram in Figure 15 below demonstrates that the data for SEQ Happen questionnaires resemble a normal distribution.

Figure 15 Histogram showing the distribution of SEQ Happen scores at week 2



When the normal probability plot or "Q-Q"plot (see Figure 16 below) is examined it shows clearly that the points cluster around the straight line and that the distribution of data resemble normality. Therefore, parametric tests will be used for comparisons where applicable in future analyses.

Figure 16 Normal probability plot of SEQ Happen scores at week 2



The results seem promising because they show that patients seem to have a broader range of views on what they believe will happen to them, whereas the majority of people have a narrower point of view on what will help (i.e. the range of scores is less). That is, there seem to be some contrasts between the questionnaires. This relationship will be examined later.

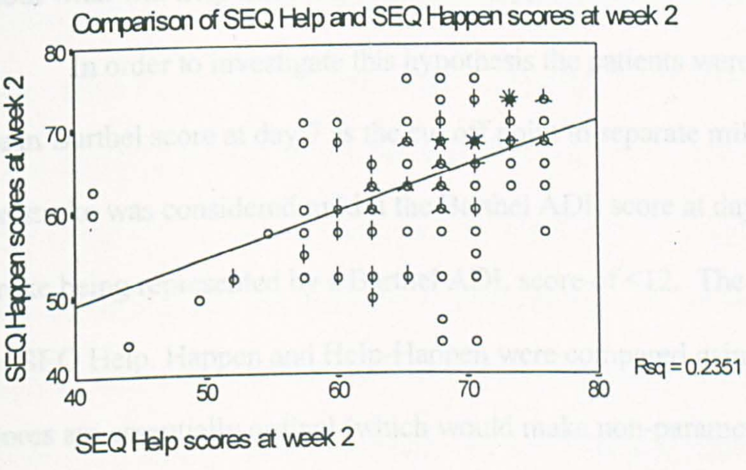
First it is important to establish that those patients for whom the MMSE scores were pro-rated, score no differently on each of the SEQ Help and SEQ Happen questionnaires than those who satisfied the inclusion criteria without pro-rating. Independent t-tests were performed for each of the SEQ Help and SEQ Happen questionnaires comparing those with prorated MMSE and those without prorated MMSE scores. There were no statistically significant differences in expectations between those with and without prorated MMSE scores at week 2 (see Table 30).

Table 30 Comparison of expectations at week 2 between those with and without prorated MMSE scores

	Patients with Prorated MMSE Mean (SD)	Patients without Prorated MMSE Mean (SD)	p value
SEQ Help	67.0 (7.1) N=24	67.5 (5.1) N=95	NS
SEQ Happen	62.1 (8.5) N=22	63.6 (7.5) N=99	NS

As can be seen in Figure 17 below, where SEQ Help scores are plotted against SEQ Happen scores, those scoring higher one seem to score higher on the other. The relationship is demonstrated by the regression line, though r squared=0.235, accounting for less than 25% of the variance.

Figure 17 Comparison of SEQ Help and SEQ Happen scores at week 2



To investigate the responses to each of the expectations questionnaires, independent sample t-tests were performed comparing SEQ Help and SEQ Happen responses.. It is apparent that though they are related (as indicated by r squared = 0.235), they also have statistically significantly different distributions (t=5.48, p <0.001, 2-tailed). This is important because it shows that people do respond differently to each of the SEQ Help and SEQ Happen questionnaires. That is, if there were no differences in scores within individuals, then the two aspects of Help and Happen may just be measuring the same thing (or that patients cannot understand the difference between the two).

We are also interested in whether those with pre-stroke handicap respond differently to those without pre-stroke handicap and this will be addressed in the following section.

8.42 Expectations at week 2 in those with and without previous stroke and those with and without pre-stroke handicap

One might expect that those with more severe strokes may have different ideas about what will help them and what will happen to them in the future.

In order to investigate this hypothesis the patients were split into 2 groups using the mean Barthel score at day 7 as the cut off point to separate mild from severe. Therefore, the stroke was considered mild if the Barthel ADL score at day 7 was >11, with a severe stroke being represented by a Barthel ADL score of <12. The scores for these two groups for SEQ Help, Happen and Help-Happen were compared using t-tests. Though Barthel scores are essentially ordinal (which would make non-parametric tests appropriate) parametric tests were used in this instance, as the distribution of scores approximates to the normal. The comparison of severe and mild strokes was also performed separately for patients with (pre-stroke Rankin >1) and without (pre-stroke Rankin <2) significant pre-stroke handicap. Each analysis resulted in a non-significant, (p>0.05) effect suggesting that the severity of stroke and whether patients did or did not have significant pre-stroke handicap has no impact on patients' ideas about what will help and what will happen to them in the future (see Table 31).

Table 31 Comparison of those with and without previous handicap

	Variable	All patients Mean (SD)	Rankin <2 Mean (SD)	Rankin >1 Mean (SD)
Mild (Barthel >11)	SEQ Help	68.0 (5.5) N=61	68.1 (5.5) N=47	67.5 (5.6) N=14
	SEQ Happen	63.6 (7.5) N=64	63.9 (7.2) N=50	62.7 (8.5) N=14
	SEQ Help-Happen	3.5 (5.9) N=62	3.3 (4.8) N=49	4.4 (9.0) N=13
Severe (Barthel < 12)	SEQ Help	66.8 (5.6) N=58	66.6 (5.7) N=49	67.9 (5.6) N=9
	SEQ Happen	63.1 (8.0) N=57	63.1 (7.6) N=48	62.9 (10.4) N=9
	SEQ Help-Happen	2.6 (9.0) N=57	2.1 (9.3) N=48	4.4 (9.0) N=9

In this chapter we have seen that every effort has been made to make this sample as representative of the total acute stroke population as possible. However, many stroke sufferers were excluded at an early stage because of the particular features of their stroke which made it difficult or impossible for them to participate in this study. For example, 23% were excluded due to cognitive or communication problems. Surprisingly, there were similar numbers of patients with right or left sided weakness as previous studies have tended to have more strokes with left sided weakness as they are less likely to have speech problems. Over a fifth of patients had had either a previous stroke or other condition which had meant that they had some experience of managing with a disability or altered lifestyle and the former were significantly older.

Only 23 patients (21%) were identified as <u>not</u> being depressed and of those who had depression 27% had a moderate to severe disorder according to the MADRS. Total scores on the GHQ 28, were significantly related to MADRS total scores.

The majority of those included in the study had had disabling strokes with 87% requiring assistance with ADLs at Day 7 post-stroke and those with pre-stroke handicap were shown not to have had more severe strokes (Table 28 section 8.3).

We then went on to examine what people thought would help them to get better and what they thought was going to happen to them in the future. We wanted to see if people respond differently to the two aspects of the questionnaire, and whether those with more severe strokes or those with previous experience of handicap differ in their views about the future. The results suggest that people respond differently to the SEQ Help and SEQ Happen questions showing that the two questionnaires examine different dimensions and that it is likely that people understand the differences when responding to each questionnaire. These preliminary results would seem to indicate that it is not the severity of the stroke or past experience of handicap which determines patients' ideas about what will help and what will happen to them in the future.

However, these findings are preliminary and we must now go on to examine the outcome of these patients. That is, whether they survived their hospital stay, how long they stayed in hospital and to where they were discharged. We will then go on to examine functional and emotional outcome at 3 months.

Chapter 9

Results - Stroke and Patient Characteristics Compared to Outcome

This chapter will examine outcome in this patient group. It will identify the characteristics of the survivors; how long subjects stayed in hospital for and to where they were eventually discharged. That is, whether or not they survived, and if they survived did they eventually recover sufficiently to enable them to return to their own home (which is also affected by the home circumstances) or was institutionalisation necessary? Length of stay was examined as an outcome measure as it is frequently used by health service managers and departments of public health. However, length of stay can be affected by many factors which are independent of physical and emotional recovery. For example, those who require Nursing Home admission can only be discharged when a bed is available and those returning to their own home can generally do so only when any necessary health or social services provision has been organised and is ready to commence. Furthermore, early death results in an overall reduction in the length of stay when examined by descriptive statistics and a high proportion of deaths can make "hospital performance" look successful if these other factors are not taken into account.

Mortality is frequently used as the primary outcome measure in intervention studies and this practice can also be misleading. In developing interventions for the elderly one is generally aiming to: "add life to years and not just add years to life" and therefore this study examined functional and emotional outcome. In the interests of clarity, we have focused on the basic activities of daily living, as measured by the Barthel score, and emotional distress, as measured by the GHQ 28 and the MADRS. However, as has been pointed out previously, the study reported here is part of several larger research and audit studies where more detailed information is available. For example, the discharge planning audit can provide information on; extended activities of daily living measures, availability and provision of formal (social services) and informal (family and friends) social support and health service utilisation data (general practitioner visits, hospital re-admissions and details of concurrent co-morbidity). The other aspects of this projects focused on carers' and therapists' ideas about what will help and what will happen. Further details of these data are available in Appendix 10.

Therefore, we will start with length of stay and will go on to examine survival, and functional and emotional outcome at 3 months. The last section in this chapter will examine patients' expectations at 3 months with regard to what they think will help and what they think will happen to them in the future. Comparison of expectations and outcome will be addressed in Chapter 10.

9.1 Outcome at Discharge

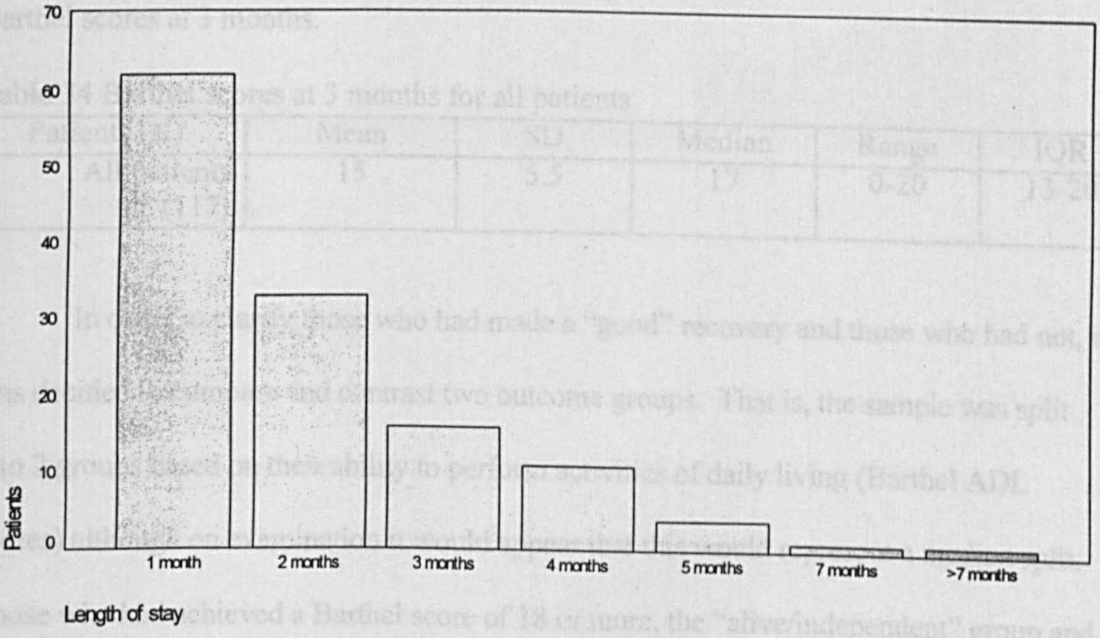
As can be seen from Table 32 and Figure 18 below, the majority (75%) of patients either died or were discharged in the first 2 months post-stroke, this figure rising to (87%) at 3 months. Furthermore, only two patients stayed in hospital for more than 6 months. The majority of patients (80%) were discharged to their own home and less than a fifth (17%) required nursing home care.

Table 32 Length of stay and destination at discharge in all patients

Variable		All patients N=128
Median LOS Rehab (IQR)		34 (20-64)
LOS (IQR)		32(12-65)
Destination at discharge	dead (%)	4 (3)
	home (%)	102 (80)
	institution (%)	22 (17)

Only 4 patients, 3% of those included in this study, died during their hospital stay.

Figure 18 Length of stay in hospital (months) for all patients



9.2 Outcome at Three Months

9.21 Demographic details at Three Months

A total of 6 patients had been lost to follow up and therefore outcome data were available for 122 patients. Of these patients, 5 had died by 3 months post-stroke leaving

117 for follow up. Table 33 below shows the demographic details of those who died and those who survived to 3 months post-stroke.

Table 33 Demographic details for survivors and those who had died by 3 months

Variable	Survivors N=117	Dead N=5
Mean Age (SD)	71 (9.6)	70 (4.6)
No. of Females (%)	59 (50)	2 (40)
No. with Previous stroke (%)	30 (26)	2 (40)
No. with pre-stroke Rankin >1 (%)	22 (19)	1 (20)

9.22 Functional outcome at Three Months

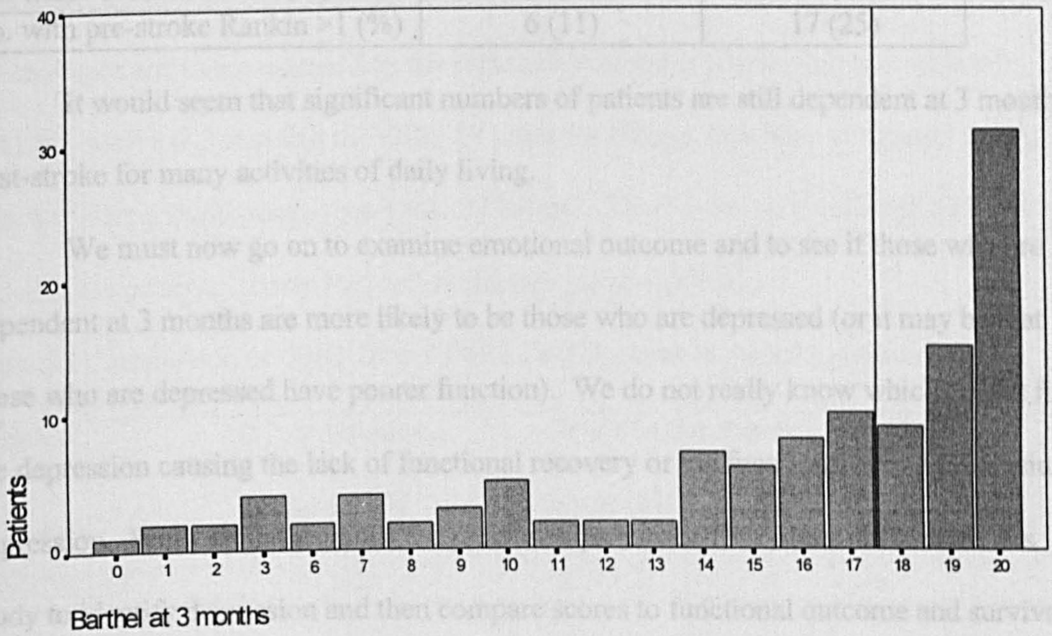
Table 34 below shows the measures of central tendency and spread for subjects' Barthel scores at 3 months.

Table 34 Barthel scores at 3 months for all patients

Patients (N)	Mean	SD	Median	Range	IQR
All patients (117)	15	5.5	17	0-20	13-20

In order to clarify those who had made a "good" recovery and those who had not, it was decided to compare and contrast two outcome groups. That is, the sample was split into 2 groups based on their ability to perform activities of daily living (Barthel ADL scores) although on examination it would appear that this would represent a median split. Those who had achieved a Barthel score of 18 or more, the "alive/independent" group and those who were either dead or had a Barthel score of less than 18, the "dead/dependent" group. Those with a Barthel score of 18 or more can generally perform most ADLs independently (e.g. washing, dressing and going to the toilet) but do not obtain the full score because although they can walk on the flat, they have difficulty in climbing stairs or climbing in and out of the bath by themselves. This splits the subjects roughly in half (45% in the alive/independent group) as can be seen in Figure 19 below.

Figure 19 Barthel scores at 3 months (line shows split between those alive/independent and those classified as dependent at 3 months post-stroke).



The demographic details for those who were alive/independent and dead/dependent are shown in Table 35 below. Those who were dead/dependent at 3 months were significantly older (t-test, t= 2.93, p=0.003) and were more likely to be female (chi-square=4.01, p<0.05) than those who were alive/independent at 3 months post-stroke. However, those who had had a previous stroke were no more likely to be dead/dependent at 3 months post-stroke than those with first ever strokes (chi-square=1.01, p=0.32).

Table 35 Demographic details for independent survivors and those who had died or were dependant by 3 months

Variable	Alive/Independent N=55	Dead/Dependent N=67
Mean Age (SD)	69 (10.5)	74 (7.8)
No. of Females (%)	22 (40)	39 (58)
No. with Previous stroke (%)	12 (22)	20 (30)
No. with pre-stroke Rankin >1 (%)	6 (11)	17 (25)

It would seem that significant numbers of patients are still dependent at 3 months post-stroke for many activities of daily living.

We must now go on to examine emotional outcome and to see if those who are dependent at 3 months are more likely to be those who are depressed (or it may be that those who are depressed have poorer function). We do not really know which comes first, the depression causing the lack of functional recovery or the functional recovery causing depression. We will first examine the relationships between the measures used in this study to identify depression and then compare scores to functional outcome and survival.

9.23 Emotional outcome at 3 Months

Both self-report (GHQ 28) and clinical assessments (MADRS) were used to identify depressive symptoms and more severe depression at 3 months and their measures of central tendency and descriptive statistics are shown in Table 36 below

Table 36 Mood measured by the GHQ 28, GHQ 28-SD and MADRS at 3 months

Variable (N)	Mean	SD	Median	Range	IQR
GHQ 28 (71)	7.4	6.1	6	0-22	2-11
GHQ 28-SD (71)	4.7	5.0	3	0-20	1-9
MADRS (57)	8.3	9.2	5	0-34	2-12

It can be seen that the numbers in the analysis is less than the number who were available for follow up. This has occurred because not all patients completed all questions on the GHQ 28 which resulted in a total score not being calculated. There are less patients with the MADRS score as these clinical assessments needed to be performed by someone with experience in the assessment of depression and this was not always possible. In order to determine whether there were any systematic differences between those assessed by the Psychologist and those assessed by the Research Assistants (those with and without MADRS scores at 3 months) the GHQ 28 totals for both groups were compared using t-tests for independent groups (see Table 37 below). There were no significant differences between the patients' scores for each of the two groups ($p<0.05$).

Table 37 Comparison of GHQ 28 and GHQ 28-SD scores in patients assessed by the Psychologist and the Research Assistants

Variable	Psychologist N=74 Mean (SD)	Research Assistants N=25 Mean (SD)	p value
GHQ 28	7.5 (6.0)	9.2 (10.5)	NS
GHQ 28-SD	4.7 (5.0)	6.2 (8.2)	NS

Mood problems continue to be apparent at 3 months post-stroke and of those who are depressed approximately 50% have moderate depression.

9.24 Expectations at 3 Months

Patients' expectations at 3 months and their measures of central tendency and descriptive statistics are shown in Table 38 below. Histograms demonstrating the distribution of scores are shown in Figures 20, 21 and 22 below.

Table 38 Expectations as measured by SEQ Help, SEQ Happen and SEQ Help-Happen at 3 months and measures of central tendency and spread

Variable (N)	Mean	SD	Median	Range	IQR
SEQ Help (95)	65.1	6.7	65	39-75	61-71
SEQ Happen (95)	61.6	8.1	62	39-75	58-68
SEQ Help-Happen (94)	3.4	6.1	2.0	-12-20	0-6

As can be seen from Table 38 above, SEQ Help scores tend to be higher than SEQ Happen and when comparisons are made used a paired-sample t-test, this difference is shown to be statistically significant (t=4.82, p<0.001). It would seem that at 3 months what people believe will help is rated more highly than what they believe will happen. Figures 20 and 21 show that scores for SEQ Help and Happen have a similar distribution and this is confirmed by the similarity of the standard deviations for both scores.

Figure 20

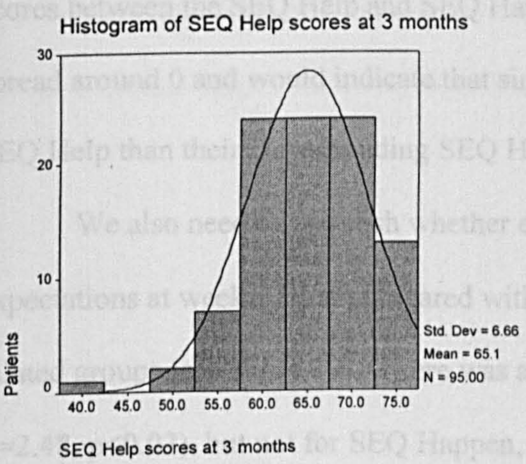


Figure 21

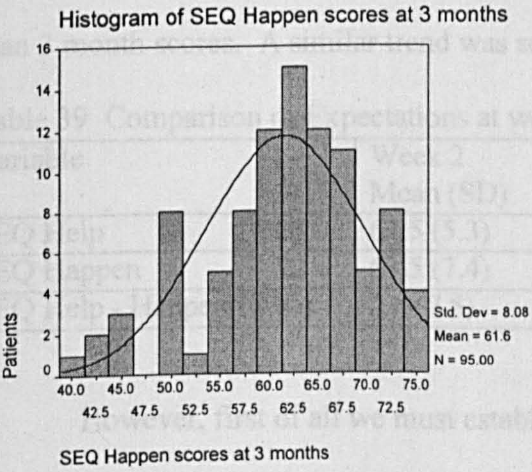


Figure 22

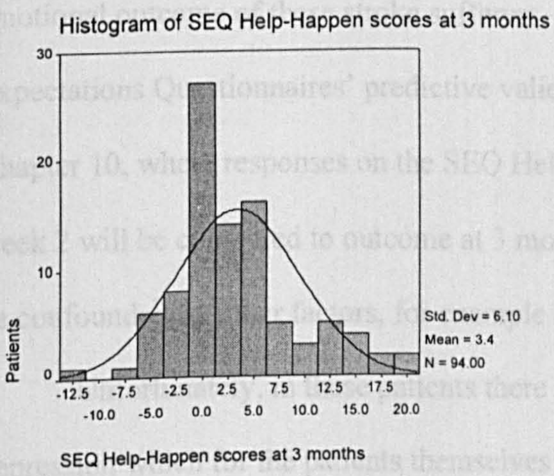


Figure 22 above shows the histogram obtained by plotting the differences in scores between the SEQ Help and SEQ Happen items. The distribution is fairly evenly spread around 0 and would indicate that similar numbers of patients score more on their SEQ Help than their corresponding SEQ Happen score and *vice versa.*

We also need to establish whether expectations change over time, therefore, expectations at week 2 were compared with expectations at 3 months using t-tests for related groups (see Table 39). There was a significant difference between SEQ Help, ($t=2.48$, $p<0.02$), but not for SEQ Happen, ($t=-1.78$, $p>0.05$) or SEQ Help - Happen, $t=0.41$, $p>0.05$), at week 2 and at 3 months. For SEQ Help, week 2 scores were higher than 3 month scores. A similar trend was seen for SEQ Happen scores.

Table 39 Comparison of Expectations at week 2 and 3 months

Variable	N	Week 2 Mean (SD)	3 Months Mean (SD)	p value
SEQ Help	88	67.5 (5.3)	65.1 (6.7)	<0.02
SEQ Happen	92	63.5 (7.4)	61.6 (8.1)	=0.08
SEQ Help - Happen	89	2.8 (7.5)	3.4 (6.1)	>0.05

However, first of all we must establish whether these differences in opinions or even certain patterns of opinions give us any indication as to the functional and emotional outcome of these stroke sufferers. That is we need to determine the Stroke Expectations Questionnaires' predictive validity. These issues will be addressed in Chapter 10, where responses on the SEQ Help and SEQ happen questionnaires from week 2 will be compared to outcome at 3 months. The possibility that responses may be confounded by other factors, for example mood, will be addressed in Chapter 11.

Unfortunately, in these patients there seems to be high levels of dependence and depression which for the patients themselves is dreadful but in terms of this study it allows us the opportunity to investigate the relationship of these problems further. That is, if levels of disability and depression were low, then one would require a much larger sample than this in order to detect significant differences.

Chapter 10

Results - Patients' expectations in relation to outcome

This chapter will endeavour to determine the relationship between responses to the Stroke Expectations Questionnaires at week 2, alone or in combination with other factors identified early following stroke, and the various indicators of status at 3 months. Initially, simple bivariate comparisons (e.g. the relationship between expectations at week 2 and mood at 3 months) will be performed which will then be used to inform a series of multivariate comparisons. The analysis aims to identify a statistical model that could be used to accurately predict outcome at 3 months following an acute stroke and to determine whether the responses to the Stroke Expectations Questionnaires improve the accuracy of predictions. The ultimate aim being to demonstrate the usefulness of the Stroke Expectations Questionnaire in identifying which patients will do well and which will do badly.

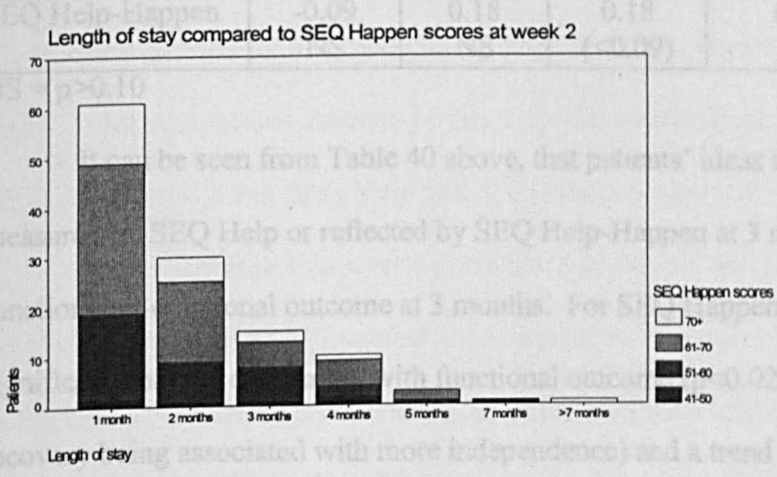
10.1 Bivariate Comparisons of Expectations at week 2 with outcome

10.1(1) Expectations Compared to Length of Stay in Hospital

If what people think will help and what they think will happen affects the way that stroke sufferers respond to the rehabilitation process, then those with adaptive ways of thinking would be expected to recover more quickly and so reduce length of stay in hospital, and conversely those with maladaptive ways of thinking would not recover or take longer to do so and consequently extend length of stay.

Pearson's product moment correlations showed (see Appendix 13) a non-significant relationship between SEQ Help scores and length of stay ($r= -0.03, p>0.05$), but a significant negative relationship between SEQ Happen scores at week 2 and length of stay ($r=0.18, p<0.05$). When a partial correlation was performed, controlling for severity of stroke (Barthel at day 7) the relationship between LOS and SEQ Happen scores was no longer significant (r=-0.10, p=0.27). A bar chart showing the relationship of SEQ Happen scores and length of stay is seen in Figure 23 below.

Figure 23 Comparison of SEQ Happen scores at week 2 and Length of Stay



10.1(2) Expectations compared to functional and emotional outcome at 3 Months

The relationship between; patients ideas' at week 2 post-stroke as measured by the SEQ Help, SEQ Happen and SEQ Help-Happen scores and dependency (as measured by the Barthel) and mood (as measured by MADRS, GHQ 28 and GHQ 28-SD) at 3 months post-stroke was explored. Pearson's product moment correlations were used, the rationale for using parametric statistics in correlations of these data has been explained in Chapter 8, where their approximation to the normal distribution has been thoroughly explored and their descriptive statistics and measures of central tendency have been presented. The results are shown in Table 40 below.

Table 40 Correlation of Expectations at week 2 and outcome at 3 months

Week 2 Variable	Outcome at 3 months			
	Barthel	MADRS	GHQ 28	GHQ 28-SD
SEQ Help	0.02 NS	0.07 NS	-0.01 NS	0.02 NS
SEQ Happen	0.23 (<0.02)	-0.23 (<0.06)	-0.18 (<0.09)	-0.17 NS
SEQ Help-Happen	-0.09 NS	0.18 NS	0.18 (<0.09)	0.17 NS

NS = p>0.10

It can be seen from Table 40 above, that patients' ideas at week 2 post stroke, as measured by SEQ Help or reflected by SEQ Help-Happen at 3 months are not related to functional or emotional outcome at 3 months. For SEQ Happen at week 2 there is a significant positive correlation with functional outcome (p<0.02, higher expectations of recovery being associated with more independence) and a trend suggesting that higher expectations of recovery at week 2 are associated with better mood at 3 months.

In summary, higher SEQ Happen scores are related to "good" outcome (less dependent and less depressed) when all patients are examined.

10.2 Multivariate Comparisons of Expectations at week 2 with outcome

Further analysis is required to determine whether the SEQ alone can independently predict outcome and whether the addition of other information which is readily available for most stroke patients would improve a predictive model. The following section will describe the analyses performed to explore the relationships between expectations, other routinely collected data and outcome.

Before variables were entered into the model it was necessary to determine how related the variables are to each other. If two variables were significantly correlated, then adding them both to the model is unlikely to alter the ability of the model to determine outcome. Furthermore, a model that was useful, either clinically or for research purposes would have as few variables as possible and any information required should be easy to collect.

Thus we performed correlations between all the variables that we felt might be useful in predicting outcome at 3 months (see Appendix 14). That is, Age, Sex, Pre-stroke Rankin, whether they had had a previous stroke, severity of this stroke (Barthel at day 7 and presence or absence of visuo-spatial inattention), MADRS at week 2, GHQ 28 at week 2 and SEQ Help and SEQ Happen scores at week 2.

Those variables that were not significantly correlated ($p>0.01$) with any of the other variables were to be included in the model to be tested. Where variables were identified as correlating significantly ($p<0.01$) with each other, a decision was made which to include (Table 41). This decision was based on how easy it would be to collect the information and which would contribute the most information to the model. For example, pre-stroke Rankin and whether the patient had had a previous stroke were significantly correlated ($r=0.24$, $p<0.009$). However, pre-stroke Rankin was included in the model to be tested as information regarding previous stroke events can be unreliable and further, pre-stroke Rankin has 6 levels of information as opposed to just 2 (previous stroke or not). As a result of these correlations, 6 variables were considered for testing in the regression models.

Table 41 Variables recorded within the first 2 weeks following stroke which are possibly predictive of outcome at 3 months post-stroke and which were significantly correlated with each other ($p<0.01$).

Possible predictor (Type of data)	Variables significantly correlated	Variable kept in model
Age (Continuous)	None	Age
Sex (Categorical)	None	Sex
Pre-stroke Rankin (Ordinal)	Previous stroke	Pre-stroke Rankin
Previous stroke (Categorical)	Pre-stroke Rankin	Pre-stroke Rankin
Barthel at day 7 (Ordinal)	GHQ 28 at week 2	Barthel at day 7
Visuo-spatial Inattention (Categorical)	None	Visuo-spatial Inattention
MADRS at week 2 (Ordinal)	GHQ 28 at week 2 SEQ Happen at week 2	SEQ Happen at week 2
GHQ 28 at week 2 (Ordinal)	Barthel at day 7 MADRS at week 2 SEQ Happen at week 2	SEQ Happen at week 2
SEQ Help at week 2 (Ordinal)	SEQ Happen at week 2	SEQ Happen at week 2
SEQ Happen at week 2 (Ordinal)	MADRS at week 2 SEQ Help at week 2	SEQ Happen at week 2

10.21 Multiple Regression Models: information recorded by week 2 post-stroke compared with functional and emotional outcomes at 3 months

A multiple regression model was tested using backwards elimination separately for each of the outcome measures. That is, all variables recorded up to 2 weeks post-stroke were initially included, regression performed and the variable contributing least to the model removed at each step. The details of the mathematical model for each regression analysis, the beta co-efficients, cut points (where appropriate), and constant terms can be found in Appendix 15). The number of comparisons possible depends on the number of subjects contactable at 3 months and having complete data for the items included. N for each analysis is presented and the reasons for non availability of data. The type of data available for each of the predictor variables is shown in Table 41. Where data were deemed "categorical" this information was entered into the model and the data treated as such. However where data were deemed either continuous or ordinal, the model will assume that data are normally distributed interval variates. The meaning of terms such as variance, for example for Barthel scores, is questionable. However, for the purposes of multiple regression analyses this allows us to examine the relationships between predictor variables in more detail and the practical implications of applying such models in clinical practice is shown at each stage.

10.21(1) Predicting Barthel Score at 3 months

We first examined a model that could predict outcome at 3 months, if outcome was measured using the 3 month Barthel score. Those patients who had died by 3 months post-stroke were included in the analyses and were given a 3 month Barthel score of 0. The model that best predicted outcome was one that included 3 of the variables (as indicated by the shaded cells in Table 42, Model 4) and accounted for 40% of the variance.

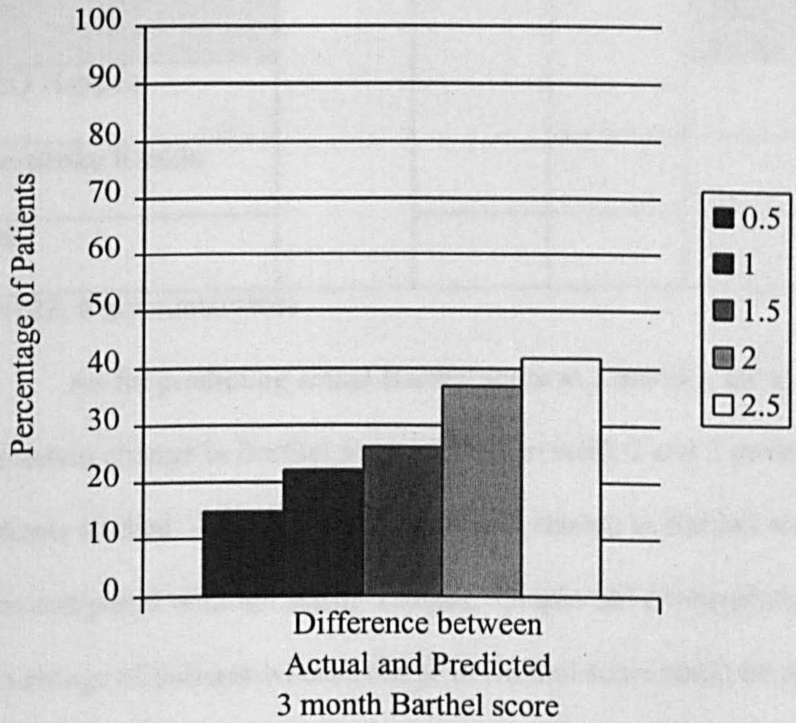
Table 42 Multiple regression models to predict 3 month Barthel score

	Percentage of variance accounted for by each Model					
Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Barthel at day 7	39	40	40	40	39	38
Age				▨		
SEQ Happen				▨		
Visuo-spatial Inattention						
Pre-stroke Rankin						
Sex						

N=122, 6 not contactable

In order to elucidate the implications of applying the model in practice, the model was applied to the actual data for the patients studied. This resulted in predicted values which were then compared with the actual values. Graphs have been plotted which show the percentage of patients whose Barthel score could be predicted to within differing levels of accuracy, to within 1, 2, 3, 4 or 5 points (i.e. the predicted score is +/-0.5, 1, 1.5, 2 and 2.5 points from the actual score, respectively). For example, at week 2 post-stroke using; age, Barthel score at day 7 and SEQ Happen at week 2 (Model 4), it would be possible to predict the Barthel score at 3 months to within 5 points in 42% of patients (see Figure 24, column 2.5). It would only be possible to make a prediction to within 1 point on the Barthel score in 15% of patients (see Figure 24, column 0.5)

Figure 24 Accuracy of predictions of 3 month Barthel score when Model 4 is applied



10.21(2) Predicting Change in Barthel Score from week 2 to 3 months

We examined a model to predict outcome at 3 months, if outcome was measured using the change in Barthel score between week 2 and 3 months post-stroke. Those patients who had died by 3 months post-stroke were included in the analyses and were given a change in Barthel score of -20 (i.e. the worst possible change). The model that best predicted outcome was one that included 3 of the variables (as indicated by the shaded cells in Table 43, Model 4) and accounted for only 8% of the variance.

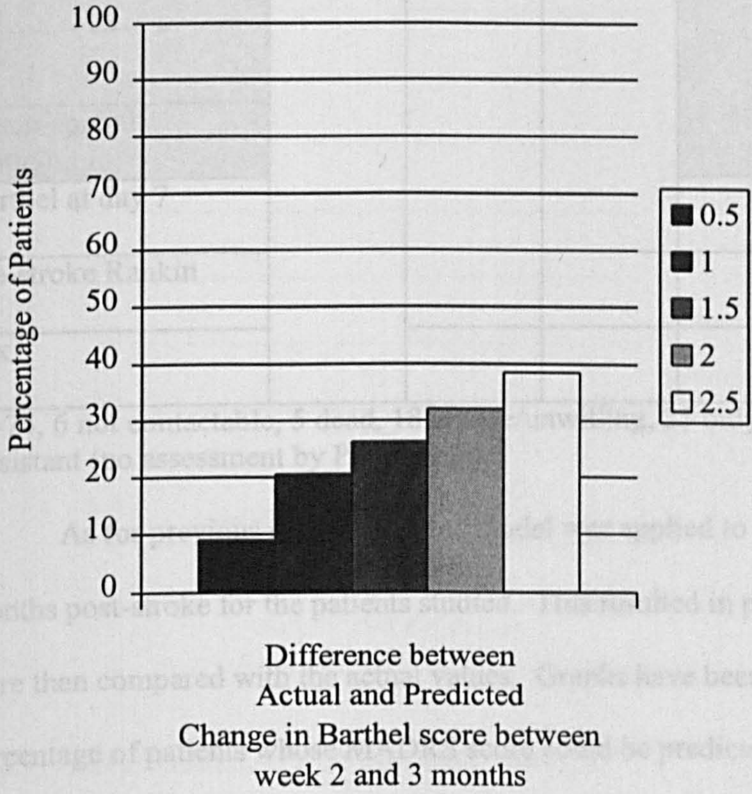
Table 43 Multiple regression models to predict change in Barthel score from week 2 to 3 months post-stroke

	Percentage of variance accounted for by each Model					
Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Barthel at day 7	7	8	8	8	7	7
Visuo-spatial Inattention						
Age						
SEQ Happen						
Pre-stroke Rankin						
Sex						

N=122, 6 not contactable

As for predicting actual Barthel score at 3 months, the model was applied to the actual change in Barthel scores (between week 2 and 3 months post-stroke) for the patients studied. This resulted in predicted change in Barthel score values which were then compared with the actual changes. Graphs have been plotted which show the percentage of patients whose change in Barthel score could be predicted to within differing levels of accuracy, to within 1, 2, 3, 4 or 5 points (i.e. the predicted change score is +/-0.5, 1, 1.5, 2 and 2.5 points from the actual change score, respectively). For example, at week 2 post-stroke using; age, visuo-spatial neglect and Barthel score at day 7 (Model 4), it would be possible to predict the change in Barthel score at 3 months to within 5 points in 39% of patients (see Figure 25, column 2.5). It would only be possible to make a prediction to within 1 point on the change in Barthel score in 9% of patients (see Figure 25, column 0.5).

Figure 25 Accuracy of predictions of change in Barthel score between week 2 and 3 months post-stroke when Model 4 is applied



10.21(3) Predicting MADRS score at 3 months

We examined a model to predict outcome at 3 months, if outcome was measured using the MADRS score at 3 months post-stroke. Those patients who had died by 3 months post-stroke were not included in the analyses. The model that best predicted outcome was one that included 3 of the variables (as indicated by the shaded cells in Table 44, Model 4) although it only accounts for 4% of the variance.

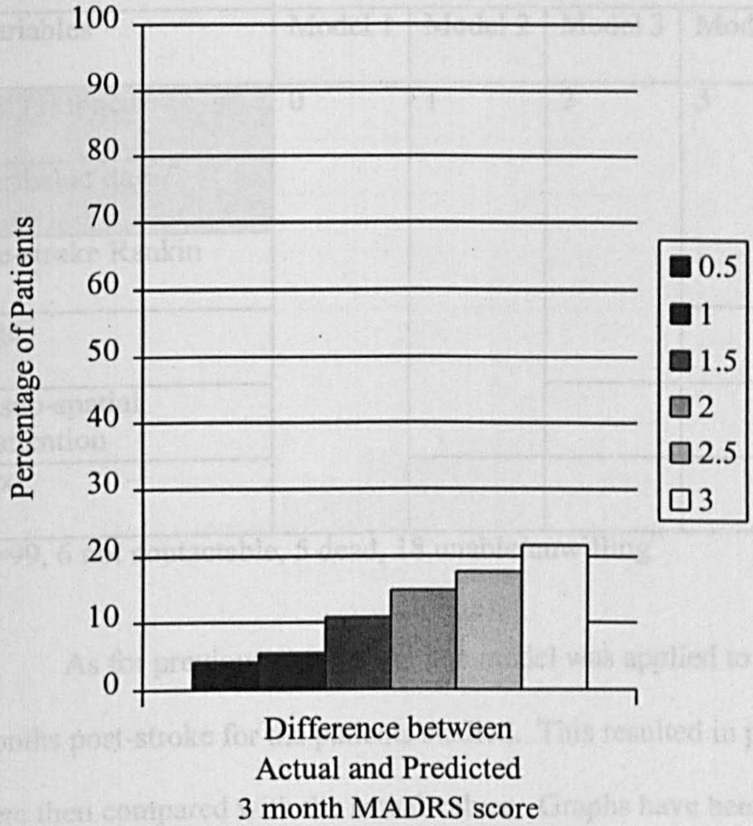
Table 44 Multiple regression models to predict MADRS score at 3 months post-stroke

	Percentage of variance accounted for by each Model					
Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
SEQ Happen	1	3	3	4	3	3
Age						
Visuo-spatial Inattention						
Barthel at day 7						
Pre-stroke Rankin						
Sex						

N=74, 6 not contactable, 5 dead, 18 unable/unwilling, 25 only seen by Research Assistant (no assessment by Psychologist)

As for previous predictions, the model was applied to the MADRS scores at 3 months post-stroke for the patients studied. This resulted in predicted values which were then compared with the actual values. Graphs have been plotted which show the percentage of patients whose MADRS score could be predicted to within differing levels of accuracy, to within 1, 2, 3, 4, 5 and 6 points (i.e. the predicted score is +/- 0.5, 1, 1.5, 2, 2.5 and 3 points from the actual score, respectively). For example, at week 2 post-stroke using; age, visuo-spatial neglect and SEQ Happen at week 2 (Model 4), it would be possible to predict the MADRS score at 3 months to within 6 points in 22% of patients (see Figure 26, column 3). It would only be possible to make a prediction to within 1 point on the MADRS score in 5% of patients (see Figure 26, column 0.5).

Figure 26 Accuracy of predictions of 3 month MADRS score when Model 4 is applied



10.21(4) Predicting GHQ 28 score at 3 months

We examined a model to predict outcome at 3 months, if outcome was measured using the GHQ 28 score at 3 months post-stroke. Those patients who had died by 3 months post-stroke were not included in the analyses. The model that best predicted outcome was one that included 2 of the variables (as indicated by the shaded cells in Table 45, Model 5), although it only accounts for 4% of the variance.

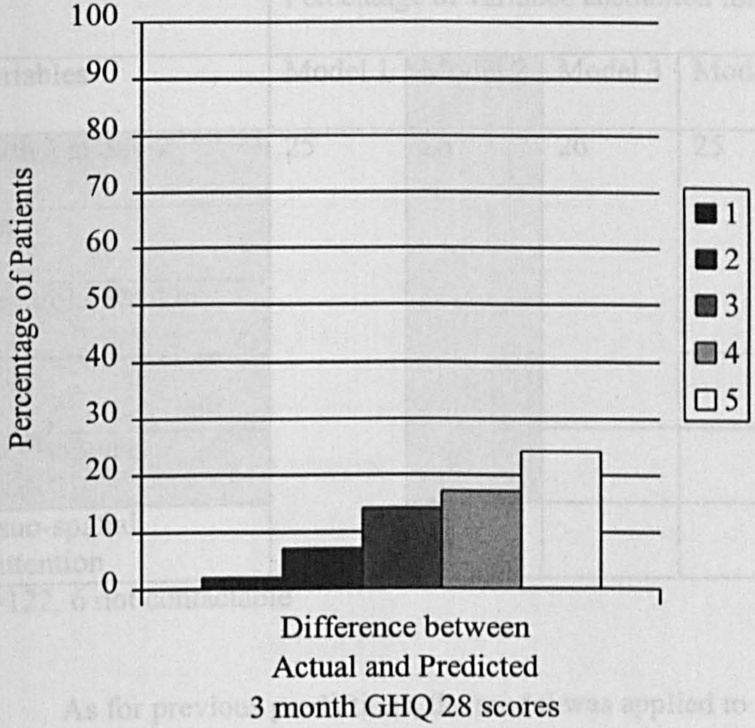
Table 45 Multiple regression models to predict GHQ 28 score at 3 months post-stroke

	Percentage of variance accounted for by each Model					
Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
SEQ Happen	0	1	2	3	4	2
Barthel at day 7						
Pre-stroke Rankin						
Age						
Visuo-spatial Inattention						
Sex						

N=99, 6 not contactable, 5 dead, 18 unable/unwilling

As for previous predictions, the model was applied to the GHQ 28 scores at 3 months post-stroke for the patients studied. This resulted in predicted values which were then compared with the actual values. Graphs have been plotted which show the percentage of patients whose GHQ 28 score could be predicted to within differing levels of accuracy, to within 2, 4, 6, 8 and 10 points (i.e. the predicted score is +/-1, 2, 3, 4, and 5 points from the actual score, respectively). For example, at week 2 post-stroke using; Barthel score at day 7 and SEQ Happen at week 2 (Model 5), it would be possible to predict the GHQ 28 score at 3 months to within 10 points in 25% of patients (see Figure 27, column 5). It would only be possible to make a prediction to within 2 points on the GHQ 28 score in 2% of patients (see Figure 27, column 1)

Figure 27 Accuracy of predictions of 3 month GHQ 28 score when Model 5 is applied



10.21(5) Predicting Rankin score at 3 months

We examined a model to predict outcome at 3 months, if outcome was measured using the Rankin score at 3 months post-stroke. Those patients who had died by 3 months post-stroke were included in the analyses and were given a 3 month Rankin score of 5 (i.e. the worst possible score within the range of the scale). The model that best predicted outcome was one that included 5 of the variables (as indicated by the shaded cells in Table 46, Model 2), although it only accounts for 26% of the variance.

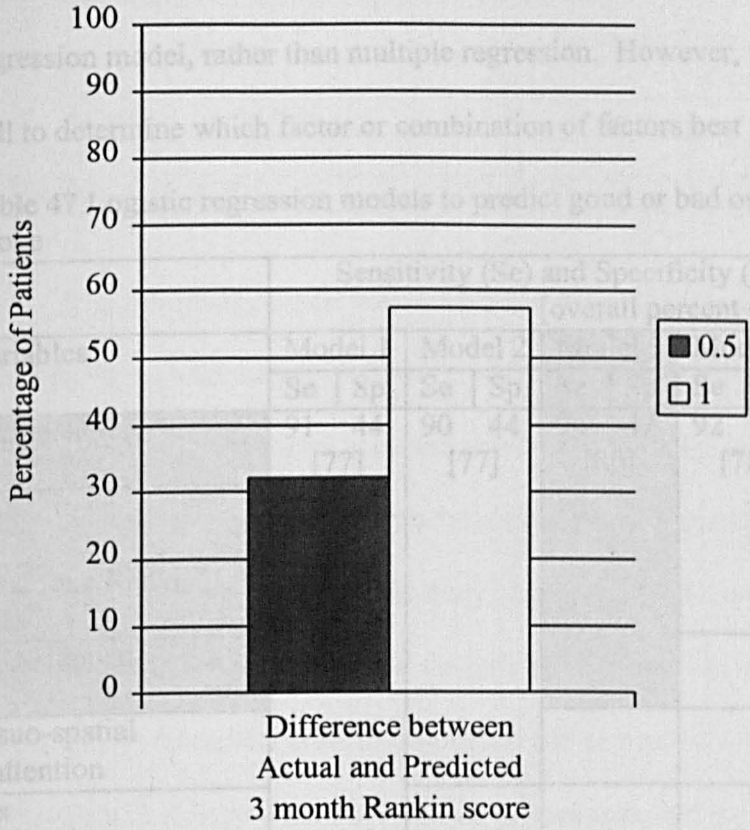
Table 46 Multiple regression models to predict Rankin score at 3 months post-stroke

	Percentage of variance accounted for by each Model					
Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Barthel at day 7	25	26	26	25	24	22
Sex						
Pre-stroke Rankin						
Age						
SEQ Happen						
Visuo-spatial Inattention						

N=122, 6 not contactable

As for previous predictions, the model was applied to the Rankin scores at 3 months post-stroke for the patients studied. This resulted in predicted values which were then compared with the actual values. Graphs have been plotted which show the percentage of patients whose Rankin score could be predicted to within differing levels of accuracy, to within 1 and 2 points (i.e. the predicted score is +/-0.5 and 1 points from the actual score, respectively). For example, at week 2 post-stroke using; age, sex, pre-stroke Rankin, Barthel score at day 7 and SEQ Happen at week 2 (Model 2), it would be possible to predict the Rankin score at 3 months to within 2 points in 58% of patients (see Figure 28, column 2). It would be possible to make a prediction to within 2 points on the Rankin score in 32% of patients (see Figure 28, column 0.5)

Figure 28 Accuracy of predictions of 3 month Rankin score when Model 2 is applied



10.22 Logistic Regression Models: information recorded by week 2 post-stroke compared with "Good" and "Bad" Outcome at 3 months

So far, we have defined outcome identified by either a functional scale (e.g. Barthel) or by a psychological scale (e.g. GHQ 28). In reality, overall outcome is dependent upon a combination of many factors. Being independent could be seen as a good outcome, however if that person were also depressed then this may actually be regarded as bad.

We therefore decided to examine outcome by defining outcome as either good or bad. Our definition of a good outcome, was that the patient was alive, was relatively independent (Barthel score at 3 months >16, a median split) and was exhibiting few symptoms of psychological distress (GHQ 28 <6, a median split). Conversely, all other patients were classified as having a bad outcome.

By having a binary outcome i.e. good or bad it is necessary to use a logistic regression model, rather than multiple regression. However, the aim of the model is still to determine which factor or combination of factors best predict outcome.

Table 47 Logistic regression models to predict good or bad outcome at 3 months post-stroke

<table>
<tr><td></td><td colspan="12">Sensitivity (Se) and Specificity (Sp) of each Model (%)
[overall percent correct]</td></tr>
<tr><td rowspan="2">Variables</td><td colspan="2">Model 1</td><td colspan="2">Model 2</td><td colspan="2">Model 3</td><td colspan="2">Model 4</td><td colspan="2">Model 5</td><td colspan="2">Model 6</td></tr>
<tr><td>Se</td><td>Sp</td><td>Se</td><td>Sp</td><td>Se</td><td>Sp</td><td>Se</td><td>Sp</td><td>Se</td><td>Sp</td><td>Se</td><td>Sp</td></tr>
<tr><td>Barthel at day 7</td><td colspan="2" rowspan="6">91 44
[77]</td><td colspan="2" rowspan="5">90 44
[77]</td><td colspan="2" rowspan="4">94 47
[80]</td><td colspan="2" rowspan="3">92 44
[78]</td><td colspan="2" rowspan="2">90 44
[76]</td><td colspan="2">84 42
[71]</td></tr>
<tr><td>Age</td><td colspan="2"></td></tr>
<tr><td>Pre-stroke Rankin</td><td colspan="2"></td><td colspan="2"></td></tr>
<tr><td>SEQ Happen</td><td colspan="2"></td><td colspan="2"></td><td colspan="2"></td></tr>
<tr><td>Visuo-spatial Inattention</td><td colspan="2"></td><td colspan="2"></td><td colspan="2"></td><td colspan="2"></td></tr>
<tr><td>Sex</td><td colspan="2"></td><td colspan="2"></td><td colspan="2"></td><td colspan="2"></td><td colspan="2"></td></tr>
</table>

The results of these analyses indicated that;

the best model for predicting good or bad outcome included 4 variables; age, pre-stroke Rankin, Barthel score at day 7 and SEQ Happen at week 2.

This model had;

1) ***a sensitivity of 94%***

(i.e. 94% of all cases who had a bad outcome would have been predicted by the model applied in week 2 post-stroke to be going to have a bad outcome)

2) ***a specificity of 47%***

(i.e. 47% of all cases who had a good outcome, would have been predicted by the model, applied in week 2 post-stroke to be going to have a good outcome).

The addition of the SEQ Happen scores into the model may allow the treatment or non-treatment of people more appropriately.

Table 48 Comparison of Actual and Predicted Outcome at 3 months post-stroke

		Predicted Outcome		
		Bad	Good	Percent Correct
Actual outcome	Bad	76	5	94
	Good	18	16	47
Overall % Correct				80

The following chapter will discuss the research process of the thesis, retracing the steps through the lengthy procedure which has eventually led to the development of, what promises to be, a useful questionnaire for both patients and clinicians. The discussion will aim to point out both the strengths and limitations of each of the preliminary studies and of the main study. Suggestions will be made as to how the research project and the subsequent analysis could have been performed differently. The results will be discussed, critically appraised and compared with psychological theory. The thesis will then go on to explore how this research and these findings could be taken forward in the future in order to ensure that the results are robust and that the SEQs are evaluated in terms of their clinical use.

Chapter 11

Discussion

This study has examined empirically whether patients' beliefs and expectations about recovery from stroke, identified using the Stroke Expectations Questionnaire, are related to and can be utilised to predict outcome with regards to survival, functional ability and/or emotional state following an acute stroke.

In this chapter the thesis will aim to provide a summary of the major findings of the Main study, relating them where possible, to the literature, whilst exploring any methodological issues and problems. The thesis will:

i) examine the characteristics of those people who were included in the study

ii) compare these characteristics and the severity of stroke with functional and emotional outcome at 3 months post-stroke

iii) compare patients' early expectations and outcome at 3 months in the context of uni- and multivariate analyses.

11.1 Patient Characteristics and Initial Assessment

In order to decide who would be included in this study, it was important to remember that the results would only be generalisable to patients who had similar characteristics to those examined. Consequently, it was recognised that it would be important to include as many patients as possible, who had recently suffered a stroke, from a defined cohort.

There were many factors which constrained the inclusion of patients and eventually only 25% (128 out of 511) of the cohort admitted during the study period participated in the study. The main reason for non inclusion was that 26% of patients died or were discharged within the first week post-stroke. It is well established (e.g. Watkins et al., 1996) that approximately 20% of subjects die in the first week and by deciding that patients would not be recruited until the second week, then it was known that this proportion at least would not be included. The majority of those dying at this stage would have been unconscious either on or after admission. It would have been inappropriate and probably impossible, to approach these people and their carers at such a time.

However, excluding those who were discharged early has resulted in people with mild strokes, who have recovered very quickly, not being examined. It may be that these people may, despite not having any outward signs of a stroke, have psychological adjustment problems following the stroke and their expectations may have been different from those included.

There was another group of patients who were screened for the study, were found suitable, but were discharged before they were assessed by the researcher and were not subsequently included in the main study. The main reason for not being able to include these patients whilst in hospital was likely to have been that they were unavailable for assessment when the researcher attended the ward. The unavailability of patients was mainly due to the presence of visitors when the researcher attended the ward. This could have resulted in those with more social support being excluded. As previous studies (e.g. Glass and Maddox, 1992) have suggested that effective social support (i.e. of adequate quality and quantity) can act as a buffer when adjusting to disabling illness, these patients may respond differently both to having and in recovering from a stroke.

In contrast to previous studies examining first ever strokes (e.g. House et al., 1987), this study included both those with first ever stroke (75%) and those who had previously had a stroke (25%). It may be that previous impairments and experience of stroke could confound expectations and adjustment. The patients in this study had differing experiences with regard to living with disability, i.e. there were 80% without previous handicap and 20% with significant previous handicap. The former were younger and less likely to have had a previous stroke. These differing previous experiences with stroke and handicap should be considered when interpreting the results of this study and in generalising the findings from this to other patients.

One of the major criticisms of studies of emotional outcome in stroke has been that of sample bias (House et al., 1987). For example, only those able to respond or write have been included. It is well known that the majority of people included in studies have been those with a left sided weakness, whilst those with right sided weakness, who are more likely to be dysphasic have difficulty participating. This was also the case in this study where 55% (70) had a left sided weakness and 36% (46) a right sided weakness.

Even at the stage of consent patients were excluded because they may have such severe cognitive or communication problems that they could not indicate verbally, in writing or by gesture that they wished to be included. Where possible, relatives were asked to witness verbal or gestured consent and this resulted in the inclusion of some patients who might otherwise have been excluded. In some cases, even though a patient managed to consent, it was felt, after screening, that their severe cognitive or communication problems would preclude them from participating in the study. Consequently, 23% (119) of patients were excluded because of severe cognitive or communication problems.

It has previously been recognised that a high proportion of stroke sufferers have cognitive and/or communication problems and that this is particularly apparent at the acute stage (e.g. Wade et al., 1992). However, if one considers that more than a third of hospitalised stroke survivors have speech problems (Bonita and Anderson, 1983) and up to 40% have problems with some type of neuropsychological functioning (Kotila et al., 1984) then it would seem that this study has excluded as few people as possible because of these factors. Nevertheless, the problems of sample bias previously reported have not been overcome in this study.

The MMSE was used in the context of this thesis to screen for cognitive impairment. However, it involves patients being able to see, talk and write, and some stroke patients had difficulties with completing some parts of the test. Therefore, in order to avoid unnecessarily (in the opinion of the researcher) excluding some patients from the study, it was decided to pro-rate items when patients were unable to complete parts of the tests due to impairments caused by the stroke. This is obviously a subjective judgement made by the researcher involved in this study and would be difficult to replicate in other studies or in fact to develop clear guidelines.

It may have been preferable to include all patients who could provide answers to the questionnaires provided and simply note their MMSE score. Comparisons of those above and below the cut off for cognitive impairment could have been performed as they have for this study, but a more complete cohort would have been examined.

Nevertheless, in this study when comparing the answers given to the SEQ Help and SEQ Happen in those who scored 23 or more on the MMSE with those who were pro-rated, no significant difference was demonstrated. This is in contrast to previous researchers where the opposite stance has been taken, i.e. unanswered questions were counted as errors (Fillenbaum et al., 1988). It is possible that cognitive problems may be over estimated in stroke patients if this strategy is adopted. This subject requires further investigation in future studies.

It is difficult to overcome all of the physical and speech problems which may exclude patients, however, the assessments used were designed to keep to a minimum, the amount of verbal or written information which was required. For example, the SEQ itself, though possible to complete in self-report fashion was often either read or shown to the patients on cards (large print) with their responses recorded by the researcher. Investigator administration of questionnaires could result in patients responding in a socially desirable form. The validity of the responses obtained could therefore be questioned. This was a particular problem with the GHQ 28, which was not designed to be administered in this format. This fact should be noted when interpreting the results.

The order of administration of the questionnaires to the patients also has some methodological limitations. The functional scores were performed initially as a way of developing a rapport, then the SEQs were given (first SEQ Help and then SEQ Happen), followed by the GHQ 28 and lastly the MADRS, which was rated following a clinical interview. The rationale for administering the depression scales last is based on reports that they are mood inducing, particularly in those who are depressed (e.g. House et al., 1987). The researcher wished to avoid, as far as possible, mood as a confound to the answers on the SEQs. The sequence of scale administration was similar for all patients studied. One may suggest that order effects may result, with patients losing concentration and tiring later in the test battery. This could have been overcome by block randomising patients to receive assessments in the range of possible orders, i.e. counterbalancing. However, this was not performed in this study.

As ill health is seen as part of older age and ageing and depression as an understandable reaction to it, health professionals frequently ignore the resultant depression and are reluctant to start treatment (Livingston and Hinchliffe, 1993; Goldberg, 1985). In those with stroke, depression is also seen as an understandable psychological reaction to a serious defect in physical or cognitive function.

Depression following stroke has been suggested to be common, though estimates of incidence rates vary greatly from 18-61% (Johnson, 1991; House, 1987; Robinson et al., 1984a; Robinson and Price, 1982).

This study has shown that significant numbers of patients (approximately three-quarters) are depressed at an early stage following stroke, regardless of the assessment tool used. The use of the GHQ 28 at an early stage following the onset of acute illness has been suggested to under-estimate caseness because its does not take account of chronicity as it has a "different from usual" response format (Goodchild and Duncan-Jones, 1985). Conversely, the GHQ 28 has been accused of over-estimating depression in those with neurological disorders (Bridges and Goldberg, 1986) and following stroke (Ebrahim, 1990). The former researchers suggesting a higher cut off of 11-12 and the latter suggesting the removal of the social dysfunction items.

Nevertheless in this study, there was good agreement between the GHQ 28 scores and the clinical interview (MADRS). However, it should be noted that these assessments were performed early following stroke and whether these symptoms represent "transient fluctuations of mood or whether they represent more stable long term mood disorder" (Robinson et al., 1984) needs to be established. This will be discussed later when mood at day 7 and 3 months are compared.

In endeavouring to compare the rates of depression identified in this study with previous work, difficulties arise. Few studies have assessed depression at such an early stage, although Robinson et al. (1983c) found 44% of stroke patients to be depressed whilst in hospital and House et al. (1987) found 32% to be depressed at 1 month. Clearly, the reported rate of depression in the subjects studied here appears exceedingly high. However, even if one took the stance suggested by Ebrahim (1990) of removing the social dysfunction item scores form the GHQ 28 total score, then 46% would still be considered to be depressed.

Ill health has been reported as a predisposing factor to depression and worsens the prognosis (Butler et al., 1997; Baldwin, 1991). Depression impedes functional recovery, is known to have a greater impact on function than most other disorders and results in more net cost to the economy than arthritis, hypertension, diabetes and chronic respiratory disorders (Silverstone, 1990; Wells, 1989; Feibel and Springer, 1982).

It should also be noted that this study has not included those with severe dysphasia (potentially these patients may have even more severe mood problems) and those with mild strokes (those discharged early) who may have been less likely to be depressed. Nevertheless, the results of this study suggest that it would be important to investigate this issue further as it has been shown that mood problems may interfere with rehabilitation (e.g. Adams and Hurwitz, 1968; Sinyor et al., 1986b).

In the sample studied here, those with pre-stroke handicap were no more likely than those without pre-stroke handicap to be depressed and there was no significant difference between these groups in terms of their stroke severity. However, the numbers of patients with pre-stroke handicap is relatively small and it may be this which has given the impression of reduced variability of scores. These issues need to be addressed in a larger sample.

The majority of subjects included in this study had moderate to severe strokes, with 87% requiring assistance with at least one activity of daily living as identified by the Barthel score, and 45% requiring at least some assistance with all 10 items. In previous studies, people admitted to hospital appear to be less dependent than the cohort studied here. For example, Andrews et al. (1981) found 74% required some assistance with activities of daily living in the second week post-stroke. Similar results have been found in other studies (e.g. Skilbeck et al., 1983). This could suggest sampling bias in the present study, as those with less severe strokes have been excluded, though differences in the casemix admitted to each centre could also provide an explanation.

At the initial assessment, in terms of responses to the SEQ questionnaires, a significant relationship was demonstrated between the two, although SEQ Help only explained 25% of the variance in SEQ Happen scores. For the majority of patients their scores on the Help items are higher than on the Happen. This could have indicated that patients were pessimistic about achieving or gaining what they thought would be the ideal circumstances or input in order to achieve their desired goals for recovery. Conversely, it could indicate that patients were realistic in their aspirations for the future. If patients complete all items on the SEQs, then possible scores range from 15-75 on both Help and Happen. Nevertheless, the patients themselves all tended to score at the upper end of the scale. This would suggest that perhaps, that even though SEQ Happen items may be rated lower than SEQ Help, people are in fact generally optimistic.

Little previous research has been performed on optimism following chronic illness as it is difficult to assess and also to determine the reference values. When studies have been performed, it has been demonstrated that dispositional optimism is related to improved health outcomes (e.g. Schier et al., 1989). Nevertheless, the results of such studies should be interpreted with caution, as not only will people differ from others, they will also differ within themselves on perhaps a day to day basis (Charmaz, 1991). It was suggested that those studies which have examined optimism at fixed time points post event (e.g. Schier et al., 1989) may miss this day to day variability.

Shifren (1996) suggested, following a study of people with Parkinson's disease, that optimism fluctuates from day to day and therefore needs to be examined on a daily basis. Further studies performed in Parkinson's patients have identified daily fluctuations in optimism (Dakof and Mendelsohn, 1986) and have shown that these changes are also accompanied by marked changes in behaviour and symptoms on a day to day basis.

However, for stroke patients there is little fluctuation in abilities over time. Consequently, for people who have suffered a stroke optimism may prove more stable, although this has not been examined empirically. Mood may also have an effect on feelings of optimism, but it should be noted that mood is not solely related to functional improvements or behaviour.

The test retest reliability, or fluctuations on a daily basis have not been examined in the study for this thesis. Further work is required on this issue. Determining whether expectations have trait like or state like properties is important, particularly if one endeavours to alter expectations.

This study has examined whether those with previous experience of stroke or those with more severe stroke respond differently to the SEQs. It was shown that expectations (as measured by the SEQ) were not related to severity of stroke and pre-stroke handicap which may suggest that expectations are more a result of trait than state.

The amounts of change and their relationship to psychosocial and disease severity factors requires further investigation. We will return to this later when we examine the relationship between expectations and outcome at 3 months.

11.2 Stroke and Patient Characteristics Compared to Outcome

Of the patients included in this study, the majority (75%) were discharged from hospital within two months of their stroke, increasing to 87% by 3 months. Only 2 patients were in hospital for longer than 6 months. Although these were a fairly dependent group of people, with 50% having Barthel scores of less than 17 by 3 months, the majority (80%) returned to their own home. Only 17% were admitted to institutional care.

Only 4 (3%) patients died whilst in hospital and a further patient died after discharge but before 3 months post-stroke. Once again, the question is asked as to how representative is this sample of patients. In another cohort identified at this centre 33% of patients had died by 3 months post-stroke and of those discharged alive nearly 90% returned to their own home (Watkins et al., 1996). Previous studies in different centres have also found that up to a third of stroke patients die whilst in hospital (Bamford et al., 1990).

However, this difference can be explained to some extent by the inclusion criteria in this study. Nearly two thirds of the patients who do die in hospital, generally do so in the first week post-stroke (Bamford et al., 1990) and for the purposes of this study, only those who survived to their second week post-stroke were included. Furthermore, it is likely that the mortality is high in those who were ill or who were still unconscious in the second week post-stroke and these patients were also excluded from the study

As previously discussed, in contrast to previous studies examining functional outcome following stroke (e.g. Wade et al., 1992), those with previous strokes were included in this study. In order to determine whether previous stroke affected outcome, the sample was split into 2 outcome groups based on survival and functional status at 3 months. The two outcome groups were

i) "good" - those who were alive or independent (Barthel >17)

ii) "bad" - those who were dead or dependent (Barthel <18)

The demographic details of the two groups were compared. It was shown that those who were older and those who were female were more likely to have a "bad" outcome. However, there was no difference in the numbers with good or bad outcome in those with or without previous stroke.

The division into the two outcome groups was somewhat arbitrary and differences may exist between those with and without previous stroke, particularly on other variables, for example, expectations and those related to psychological adjustment. This requires further investigation in the future.

In examining emotional outcome at 3 months post-stroke in this study, more than 50% were identified as depressed, regardless of the assessment tool. This is consistent with previous studies identifying significant psychological morbidity in the first year following stroke (for example, House et al., 1991).

Comparisons between studies is hampered by the use of different instruments to measure depression and the make up of the cohorts. Furthermore, in this study, not all patients seen at 3 months post-stroke were assessed using both self-report (GHQ 28) and clinician rated depression scales (MADRS). If a patient was seen by a psychologist, both the MADRS and GHQ 28 would be performed. As the MADRS is a clinician rating scale, those patients seen by a research nurse were assessed with the GHQ 28 only. Despite there being no statistically significant differences in the GHQ 28 scores between those assessed by the psychologists and the research nurses, other differences between these patients and their responses to the stroke expectations questionnaires may exist.

When examining patients responses to the SEQs at 3 months post-stroke, it is apparent that scores are approximately normally distributed for both SEQ Help and SEQ Happen as they had been at week 2. Once again SEQ Help scores were significantly higher than SEQ Happen, suggesting that patients continued to be pessimistic about their ability to obtain or attain what they believed would help their recovery. The domains contained within the SEQs are consistent with previous qualitative studies, although the contrast between what people believe will help them cope and what they believe will actually happen has not been previously evaluated in a structured way.

For example, Cox et al. (1998) in qualitative interviews with elderly stroke survivors emphasised the importance of feeling respected, being able to make decisions, being cheerful and motivating oneself. Similar domains for example, independence, socialisation, self-esteem and motivation were identified as important in a study of people with acquired spinal cord lesions (Brillhart and Johnson, 1997).

It is suggested by the researcher that it is only by identifying specific areas where stroke survivors feel that their needs may not be met that both clinicians and carers can respond to meet peoples needs and allay their fears. This would allow clinicians and carers to investigate alternative strategies which encourage adjustment and a reintegration into more normal lifestyles following stroke.

It is not possible from the results presented here, to determine whether the lack of change in stroke survivors expectations of what will actually happen is the result of expectations being stable traits that will never change, or whether these ideas are amenable to change but have not been addressed. The first step would be to determine whether expectations are related to outcome.

11.3 Patients' expectations in relation to outcome

This study has shown that patients with higher SEQ Happen scores at week 2 have shorter lengths of stay in hospital and those with lower SEQ Happen scores are in hospital for much longer. A similar relationship was not demonstrated with SEQ Help scores.

However, when controlling for severity of stroke, the relationship between SEQ Happen and length of stay becomes non-significant. This would suggest that severity of stroke is a more important determinant of length of stay or perhaps patients are able to take account of the severity of their stroke in deciding what they believe will happen in the future.

The study went on to compare early expectations at week 2 with functional and emotional outcome at 3 months post-stroke. Though it may be thought that this is too early to assess functional outcome, in fact most functional recovery occurs in these first 3 months (e.g. Wade, 1992; Ebrahim, 1985) and it may be that most emotional problems start in the first few months even if they are often not noticed until much later. The identification of problems with adjustment, if addressed in the first few months post-stroke could possibly avert problems later.

When comparing expectations at week 2, it is apparent that SEQ Happen but not SEQ Help scores, are significantly related to functional and emotional outcome at 3 months post-stroke. Those with higher SEQ Happen scores are more likely to be independent and not depressed, whilst those with lower SEQ Happen scores are more likely to be dependent and more likely to be depressed. Higher SEQ Happen scores are suggestive of "good" outcome at 3 months.

These results are consistent with the work of previous researchers (e.g. Singer, 1974; Singer 1976; Hyman, 1972). For example, Singer (1974 and 1976) in her studies of Parkinson's patients, found that those with low self-esteem and who thought that their prognosis was poor were more likely to be socially withdrawn, demoralised and depressed. Conversely, those with calm acceptance, high hopes and high expectations of recovery were socially active and had an increased sense of well being. Furthermore, these relationships held even when adjusting for severity of Parkinson's disease and the resultant disability.

Regression analyses were performed in order to develop a statistical model, utilising data routinely available by week 2 post-stroke, to reliably predict outcome at 3 months. In addition, the contribution of the SEQs to the accuracy of these predictions was also determined.

The first step was to identify which variables, based on current thinking, were likely to be useful in predicting outcome at 3 months. It was only possible to consider variables that had been collected specifically for this study and those that are routinely available for all patients on the stroke register. The analysis was therefore constrained by the availability of information.

Six independent variables were to be entered into each model to predict the dependent variable. It has been suggested that at least 10 subjects per variable are necessary to ensure adequate sample size (Hier and Edelstein, 1991). As there were more than a hundred subjects in this study, then this would suggest that the sample size was adequate. However, data for each subject on each variable is necessary for the regression model. Therefore in some circumstances where data were missing or had not been collected (the MADRS was only collected when a psychologist assessed the patient) there were barely sufficient numbers to apply Hier and Edelstein's (1991) "rule of thumb".

Multiple regression analyses were performed using 6 variables, Barthel at day 7, Age, SEQ Happen at week 2, Visuo-spatial inattention, Pre-stroke Rankin and Sex. In SPSS statistical analysis package it is possible to acknowledge the categorical nature of data within a multiple regression analysis. However, for data such as the Barthel and the Rankin, which are essentially ordinal in nature, these data are analysed as if they were interval. This is not strictly statistically correct, although in these circumstances it has allowed us to explore the possible relationships between the predictor variables. In performing what is essentially multiple correlations we could just be detecting random noise within the data. If it had been possible to use rank correlations within a multiple regression model then these problems may have been overcome.

The accuracy of predictions of both functional and emotional outcome was poor. For example, the best model identified to predict Barthel at 3 months accounted for only 40% of the variance. In practice it would only be possible to predict Barthel scores to within 5 points in 42% of patients. This sort of model would not be suitable for the "rationing" of therapy.

The prediction of emotional outcome was even less accurate. For example, the best model identified to predict the MADRS at 3 months accounted for only 4% of the variance. In practice it would only be possible to predict MADRS scores to within 6 points in 22% of patients. Again, this model would be unsuitable for the "rationing" of therapy.

Even with the Rankin, the best model only accounted for 22% of the variance and allowed the prediction of the Rankin at 3 months to within 2 points in 58% of patients.

It may be, that by restricting the number of variables entered into each model in the first place, that the accuracy of predictions has been limited. For example, the SEQ Happen score, although significantly correlated with the GHQ 28 score, may not be a good proxy for it. The accuracy of predictions may have been improved by using the GHQ 28. This needs to be investigated further.

These aforementioned multiple regression analyses have used the score on one dimension (i.e., a measure of function or a measure of psychological well-being)as the dependent variable. In reality having a "good" outcome on one dimension does not necessarily ensure that a "good" outcome is achieved in all dimensions. For example, being independent does not mean that someone will not be depressed.

This study has therefore used logistic regression analyses to evaluate the prediction of a "combined" dependent variable. The prediction of Good (alive/independent/not depressed) and Bad (dead or dependent/depressed) outcome were evaluated in a series of logistic regression models. The best model for predicting the Good or Bad outcome included the variables; Age, Pre-stroke Rankin, Barthel at day 7 and SEQ Happen at week 2. This model had a sensitivity of 94% and a specificity of 47% and an overall accuracy of 80%. The model was more accurate at predicting Bad than Good outcome. The main predictor was Barthel at day 7, suggesting that it is initial severity of stroke which is generally the ultimate determinant of outcome. However, the addition of the SEQ Happen scores from week 2 improved both the sensitivity and the specificity of the model, even if only marginally.

In order to use this model in clinical practice it would need to be tested in a in different cohorts. It should be noted that this was tested in a cohort which represented only 25% of patients admitted to hospital with an acute stroke at the centre used.

The cut off used in order to delineate the Good and Bad outcome groups were arbitrary even though based on a median score for the sample in question. Using different cut offs may have resulted in more or less accuracy of the model.

Furthermore, for individual patients achieving a score above the median may have been impossible due to the severity of stroke. For example, those with a Barthel score of 3 at week 2 post stroke would be expected to make little change. For such patients however, their quality of life may be improved greatly by becoming able to give themselves a drink from a beaker, although this would only raise their Barthel score by 1 or 2 points. On the other hand, someone with a Barthel score of 20 may need to make large changes in their mood scores in order for them to feel able to socialise.

It may be that different predictors and different definitions of Good and Bad outcome are required for different people. It will be necessary to further explore the characteristics of prognostic groups in the future.

The variables identified for the best model using logistic regression to predict outcome at 3 months were; Age, Pre-stroke Rankin, Barthel at day 7 and SEQ Happen at week 2.

Age has previously been identified as an important predictor of psychosocial adaptation to chronic disease (e.g. Singer, 1974). When examining the psychosocial consequences of Parkinson's disease, those with the disease were compared to people of similar age without the disease (Singer, 1974). It was apparent that "older patients though more incapacitated in an absolute sense" were "relatively less deprived than younger patients". That is, older peoples lives were restricted because of their symptoms and disability, but to some extent this was consistent with their expectations of older age. Whereas younger people with the disease were not expecting to be so restricted in their lifestyle and so for them the disease was somehow worse. This was discovered because of the comparison with people of a similar age but without the disease.

The study reported here examined a group of people who had recently suffered a stroke. In examining the prevalence of depression, low and high expectations and other outcomes, no comparison has been made with a group without the disease. It has been assumed that the features seen are stroke related. This obviously may not be the case.

This study, where Barthel, used as a proxy for severity of stroke, has been identified as the best predictor of outcome supports the results of previous studies.

However, it is difficult to make comparisons, as studies frequently use different predictors and different outcome measures. However, Wade et al. (1987) in attempting to predict outcome at 6 months post-stroke, in terms of Barthel score, used initial Barthel score, although the exact time post-stroke when this information was collected is unclear. It would appear that some information was collected early for the majority of hospitalised patients, but many were not identified until they were discharged into the community. Other data also included were urinary continence, sitting balance and age. Using urinary continence is confusing however as continence forms part of the Barthel scale and has previously been shown to be one of the best predictors of Barthel total itself (Ellul et al., 1998). Sitting balance was negatively correlated with outcome and Wade et al (1987) suggest that this could be an artefact of the use of multiple regression analyses.

We included visuo-spatial inattention and this too could be a marker of severity of stroke, although in our analyses it was not significantly correlated with any of the other variables proposed as possible indicators of outcome. This could have been as a result of the scoring being categorical in nature.

Although it has been suggested that measures which successfully discriminate between patients at one particular point in time, are sensitive to changes over time (Katz et al., 1992; Ware et al., 1993) there are some limitations with such a suggestion, should one try to apply it to the results of this study. That is, in determining outcome at 3 months no account has been taken of any intervening medical or life events experienced by the patients in this study. Even without the occurrence of identifiable events in the intervening period, the importance of accessing ideas at different time points has been stressed, as it has been suggested that peoples' stories are revised as time goes by and circumstances change (Sandelowski, 1994).

When staff access the stories of patients, then it is only the feelings or views at that particular time point or "remembering moment" that are accessed and are therefore available to be addressed (Sandelowski, 1994). It is important, to address this phenomenon in the future with regard to the SEQ as different people may have higher or lower scores at different time points and this may affect the rehabilitation process at a later stage.

Despite these limitations it would appear that the SEQ Happen questionnaire may be a useful tool in identifying those who will do well and those who will do badly following an acute stroke. Until an acute stroke treatment is developed, then severity of stroke cannot be altered. Furthermore, SEQ responses were not related to severity of stroke, but continued to predict outcome. Therefore, it may be more beneficial to focus on factors that are possible to change and are likely to facilitate adjustment.

Both in the qualitative study reported in Chapter 5 of this thesis and anecdotally from the researchers involved in the main study for this thesis, it would appear that the patients themselves felt it useful to talk to someone outside of the family, i.e., someone who they were not afraid of upsetting, which allowed them to be honest about their feelings.

Wade (1985) has noted that when nurses are busy they tend to focus on practical care of patients and subsequently, the psychosocial aspects of care get neglected. This is unfortunate, as several studies have shown that expert nurses can "know" the patient, can individualise care and support and can subsequently change patient outcomes (Radwin, 1995; Tanner et al., 1993; Jenny and Logan, 1992).

It may be that the provision of a tool (e.g. the SEQ) that is simple and quick to administer would assist in the identification of problem areas (i.e. in adjustment or unrealistic expectations of what is likely to happen in the future).

The SEQ may be useful, just as a prompt, for further discussion if staff have more time to talk to patients, as the importance of allowing patients to tell their own "stories" of what has happened to them and what they think will happen in the future has been demonstrated (Sandelowski, 1994). She points out, that it is often the result of a simple question from a nurse which actually initiates the storytelling process. This narrative not only allows explanations of events but is felt to help the patient to create order or meaning and thus come to terms with their illness or disability (Sandelowski, 1994).

This study has shown that feelings of determination, self-efficacy, and mental competence are important in recovery following stroke. SEQ Happen scores were significantly related to mood, both at week 2 and at 3 months post-stroke. It will be important to explore the possibility of altering expectations in the future in an attempt to reduced the likelihood of depression. It would be important to explore whether treating depression with drugs reduces patients' feelings of self-efficacy and the possibility that side effects from these drugs may reduce perceived control. Change in SEQ scores over time and their predictive validity in terms of late outcomes (e.g. at 6 and 12 or more months post-stroke) have yet to be determined.

This study addressed the predictive validity of the SEQ when administered at a very early stage post-stroke (week 2). Information was collected simultaneously on past or current contextual factors (demographic, functional and emotional) and the patients were followed up at 3 months post-stroke. The numbers of patients who had died and the functional and emotional outcomes in the survivors were determined. In analysing these data, it was important not only to measure, but to take into account the context (as previously described) in which questionnaires were obtained. That is, this study determined if those people with, more or less severe strokes, or those who had had either a stroke or another disabling condition previously, answered the questionnaires differently and subsequently recovered differently. Furthermore, this study determined whether emotional problems (according to the GHQ 28 or MADRS) affected or outweighed SEQ responses.

This study has shown that the severity of stroke itself does not affect the way patients respond to the SEQ questionnaire. Responses are not different in those who have experienced a previous stroke.

The suggestion that attitudes and ideas are stable over time has been addressed in the literature. It has been shown that although some people do believe that personalities and their resultant behaviours are stable (e.g. McCrae and Costa, 1984; Allport, 1961) others feel that people are shaped by socialisation and life experiences and therefore respond differently in different situations. That is, that attitudes and reactions are essentially malleable (Markus and Wurf, 1987; Markus and Kund, 1986). They suggest a "working self-concept":

> "*... the self-concept of the moment ... and ... is best viewed as a continually active, shifting array of accessible self-knowledge*"
>
> (Markus & Wurk, 1987, p306)

Stable as well as dynamic properties are emphasised, some being activated only in specific contexts which therefore may include stroke. The responses of people who have already had previous experience of disability and altered lifestyles, may therefore differ from those who have never experienced such problems. It may be that these differences are most marked in the acute stages following a stroke and may converge as time passes. That is, as the months go by after a first stroke, the person, having gained experience of living with chronic disability, may, when completing the SEQ at a later stage (after 3 months post-stroke) eventually respond more similarly to those who were in the group with significant pre-stroke handicap (Rankin >1).

However, whether the self-concept is changeable in the context of everyday life experiences or a life event was assessed by Hooker (1991) in those who were going through the retirement process. She found that for some people certain characteristics were labile, while others were stable, and furthermore, some of the factors which were common across individuals also varied within individuals. For example, competence and mastery are inherently linked with actions or rôles and if one's actions or rôles change then one's concept of competence or mastery would necessarily change. Therefore, it may be that only some of the stroke patients included in this study may change their ideas over time, with others not really changing at all.

If some people do change their ideas and others do not, this may also mean that some people may be able to benefit from cognitive behavioural therapy and others may not (this is discussed further in the following chapter).

The SEQ reflects response to the rehabilitation process in terms of survival, and functional and emotional recovery. The dimensions identified are those of determination, self-efficacy and competence. Similar dimensions have been identified in a qualitative study which explored factors that assisted recovery in patients on a geriatric rehabilitation unit (Resnick, 1996). Patients were interviewed in week 1 after admission, and again every 3-5 days thereafter (on at least 3 occasions). The following themes were reported, which were felt to improve motivation; goals, humour, caring, beliefs, encouragement, a motive disposition, and "power with" relationships. Conversely, feelings of domination and negative beliefs were reported as demotivating. However, the efficacy of these factors was not assessed in an independent sample. Though, the effect of intervention on outcome was not assessed, the themes identified support the ideas reflected by the SEQ. For example; *"keeping cheerful", "trying hard", "being able to do most things that one sets ones mind to", and "having the help and support of family and friends".*

In another study, where patients' transition in to the community was examined, interviews performed post-discharge identified the following themes; perceived self-efficacy, resources, dimensions of occupation, environmental constraints and opportunities (Gage et al., 1997). Once again, the themes identified support the ideas reflected by the SEQ. For example; *"I'll be capable of making my own decisions", "I'll be able to see hear and understand what is going on around me" and "my family and friends will think that I have something worthwhile to say".*

In conclusion, the SEQ has been shown to reflect the response to the rehabilitation process in terms of survival, and functional and emotional recovery. The dimensions identified are those of determination, self-efficacy and competence.

The practical application of the SEQ and suggestions for further research will be detailed in the following chapter. The study will be set in the context of the larger research study of which it was a small but important part. Suggestions for areas of possible further investigation of the data available will be briefly outlined.

Chapter 12

Interventions and Further Research

In order for the SEQ (see Appendix 16) to be considered a robust predictor of outcome, several issues require further research. For example, the present study is primarily concerned with in-patients, but, about a third of stroke patients are never admitted to hospital in Liverpool, and the proportion varies between centres (e.g. Bamford et al., 1990). It will be important to examine beliefs and expectations in different groups of people who have suffered a stroke and subsequently been managed in a variety of hospital and community settings.

The reliability of the questionnaire requires further examination. Test retest reliability was not assessed in the context of this study. It is important to establish if people respond in a consistent way at a single time point to demonstrate that patterns of responses obtained in this study were not merely random variation.

This study excluded people who had severe cognitive and/or communication problems. The use of the SEQ and other assessments used requires further exploration in a larger proportion of patients and the effects of cognitive or communication problems on the patterns of response obtained requires examination.

Further, it must be determined whether expectations differ or remain stable over more prolonged periods of time. In this study although SEQ Happen scores appeared to be higher at week 2 than at 3 months, this difference was not statistically significant (t-value=-1.78, $p>0.05$). However, SEQ Help scores were significantly lower at 3 months than at week 2 (t-value=2.48, $p<0.02$).

The effect of mood or other emotional factors (e.g. anxiety) on response to the SEQ scores must also be determined, as should order effects of questionnaire administration. For example, although the responses to a 15 item version of the questionnaire were tested theoretically in the analyses of the results of the main study for this thesis, these items formed part of the 44 item version. The questionnaire requires evaluation in its suggested 15 item format.

Once these factors have been established, and should the SEQ be shown to demonstrate adequate reliability and consistency, then it could be further tested as a predictor of outcome.

The SEQ may also prove useful in identifying those who will benefit from interventions and those who may not. For example, it has been found that certain characteristics are labile in some people, whilst being stable in others and some factors are both common across individuals which also vary within individuals (Hooker, 1991). Therefore identifying factors (e.g. personality variables) that together with SEQ responses can identify who may benefit from interventions will also be important in order to provide further insight into what may prove complex interactions.

The complexity of individual responses to psychological interventions have previously been demonstrated. For example, cognitive behavioural therapy and brief psychotherapy have been shown to be effective in the treatment of loss events although only some people were shown to benefit significantly (Morris and Morris, 1995). This was confirmed in a different study which examined psychological outcomes in spinal cord injured patients who had received cognitive behavioural therapy (CBT) during rehabilitation (Craig et al., 1997). Although no differences were found in; anxiety, depressed mood or self-esteem when treatment and control groups were compared, those reporting high levels of depressed mood before therapy were found to be significantly less depressed 1 year post injury. They concluded that not everyone needs CBT (at least whilst in hospital) but those with high levels of depressed mood benefit greatly (Craig et al., 1997). Future studies may therefore concentrate on determining the effect of psychological interventions in those who are identified, using an appropriate screening mechanism, as having depressed mood prior to their spinal cord injury. The SEQ may prove to be a screening tool for identifying those who may benefit most from interventions following stroke. This requires further investigation.

Depression in later life is common but far from inevitable and is too often left untreated (Katona et al., 1995). Furthermore, older people are less likely to receive psychosocial therapy (Woods., 1993; Paykel and Priest, 1992) even though CBT and brief psychotherapy have been found to be effective (Old Age Depression Interest Group, 1992).

Lack of identification of and subsequent treatment of depression is well recognised in stroke patients (House, 1989b). It has been suggested that different facets of mood or emotional disorder should be explored and the best approach to management may well not be the same for all depressive disorders.(House, 1991).

In a population based post-discharge study currently being performed in stroke patients by Allan House and his colleagues, the effect of CBT is being assessed. That is, in all patients, not just those identified as "cases" for depressive illness. The results of his study have yet to be published. The SEQ's use as a screening tool for psychological adjustment problems and in determining those who may benefit from CBT s needs to be assessed in the future.

Further research into new treatments for stroke is ongoing. A reduction in mortality with the subsequent increase in the numbers of survivors may increase demand on rehabilitation services. In such circumstances tools such as the SEQ, which at present has only received preliminary evaluation in 25% of a cohort of stroke survivors, may prove even more useful.

As previously, described in Chapter 7, the main study for this thesis was performed in parallel to an ongoing program of research at Aintree which is facilitated by an accurate stroke register and data collection schedule performed on all patients admitted with an acute stroke and also those who suffer a stroke following admission to hospital.

Basic demographic details are recorded as well as; information about stroke severity and sub-type, the timing and results of stroke specific investigations and treatments, the length of stay in acute and rehabilitation care and some basic details of functional and cognitive problems; pre-stroke, on admission, day 7, transfer from acute care to rehabilitation and at discharge from hospital (for proforma see Appendix 9).

In parallel to the main study for this thesis, a discharge planning audit was performed on stroke patients admitted to Aintree January- June 1996. For this project, the usual data was collected in hospital, but all patients had a more detailed assessment at discharge and have been followed up in the community up to 48 months. This audit aimed to assess communication across the hospital-community interface and to examine the timeliness and targeting of interventions by health and social services.

The main study for the thesis was in itself a larger piece of research which examined patients', physiotherapists' and carers' ideas about what they thought will help recovery and what will happen in the future (schedule of assessments is contained in Appendix 10). Comparing and contrasting the ideas of patients, carers and therapists may provide further insight into the interaction of beliefs and expectations. In the interest of clarity it was decided that the thesis should restrict itself solely to the consideration of patients' expectations and outcomes. However, the researcher will pursue the further analysis of this complex dataset over the coming years.

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APPENDIX 1

EXPECTATIONS

Patient Name:

Reg No:

TIMING:
Week 2 ☐
Discharge ☐
3 Months ☐

BARTHEL ADL SCALE

Past ☐ **Current** ☐

Bowel function

0 - incontinent (or need enema) 1 - occasional accident 2 - continent ☐

Urinary function

0 - incontinent (or catheter) 1 - occasional accident 2 - continent ☐

Grooming

0 - needs help 1 - independent for face/hair/teeth/shaving ☐

Toilet

0 - dependent 1 - need some help 2 - independent in all actions ☐

Feeding

0 - dependent 1 - need some help 2 - independent in all actions ☐

Transfers from bed to chair

0 - unable to sit out of bed 1 - needs help of 2 2 - needs help of 1 (or supervision) ☐
3 - independent

Mobility

0 - immobile 1 - propel self in wheelchair 2 - walks 50m with help ☐
3 - walks 50m independently

Dressing

0 - dependent 1 - need help, does half 2 - independent (incl buttons, zips, laces) ☐

Stairs

0 - Unable to manage 1 - needs help 2 - independent ☐

Bathing

0 - dependent 1 - independent (or in shower) ☐

APPENDIX 2

Schedule for semi-structured interview for qualitative study

Introduction to the aims of the study:
We are trying to find out what you think: Will help you to get better, will happen to you over the next few months what you usually do in your life and how you feel your life may change. This information will be of value to doctors and scientists in planning care and rehabilitation for patients in the future. Your contribution will be a real chance to allow support for and knowledge for people who have a stroke in the future. This will not necessarily affect your treatment and you can ask me to stop at any time.

Remember me, I saw you yesterday and asked you for your help with this project. I am interested I how people cope after they have had a stroke and what they feel about it all.

I thought we could start by you telling me about what has happened to you and then perhaps we could talk a bit about yourself, who is in your family and the relationships that you have with them. I would like to see the sort of social roles that you have. That is, the sort of things that you generally do with your life, who you feel you are, how other people see you and how you help other people in their lives.

So can you describe what happened when the stroke occurred?
Did you know what was happening to you?

Describe what happened when you came to hospital?
What has been happening now?

How has the stroke affected you physically?
How do you think that you will be in a few months time?

How has the stroke affected you mentally?
How do you think that you will be in a few months time?

How do you feel in yourself?
How do you think that you will be in a few months time?

What do you think now about what has happened?
What do you think is going to happen now?
Why is that?

Have you seen anything on the ward that has made you change your opinion about strokes?
Have you been told anything that has changed your opinion? By staff, by relatives?

How do you think your family feels about what has happened to you?
Are there family things that you are particularly worried about now?
How do you think your relationships with the family will change?
Why do you think they may change?

Are there things that you do for the family/friends that will be difficult now?

How do you think the changes in your body will affect your life now?
Do you think that you will just be as you were before the stroke in a few weeks/months time?
What do you think the chance of that are?

What could change what you think will happen?
What do you think will help you get better?
What do you think will help you to get back to normal?

Who would you turn to for help?
Who turns to you for help?

Do you feel that you can/they could ask help?
What sort of help would you/they feel OK about asking for?
What sort of help would you/they not feel OK about asking for?

Is there anything that we haven't talked about that you would like to?
How do you feel about things at the moment?

The interviewer would continue talking about issues raised until a suitable point is reached to end the conversation and thank the person for their help and to ask permission to pop back to see them should any specific points require clarification at a later date (e.g. when transcribing the information).

APPENDIX 3

FC
Years ago. I was always with my Lizzy. She died 5 years ago. I miss her terrible.

You got on well then?
Oh, yes. Thanks to the family.

Was she ill then?
Oh, yes. She had a stroke and she was bedridden. It shook me up, especially when this happened to me.

What do you think is going to happen to you?
What I think, is a hard question to ask me. I want to get back to the bungalow, I wont go to a home. Not on my life. I want to die at home and I don't want to die here.

You'd rather be at home if your going to die?
Yes.

Do you not think your getting better?
Oh, yes I'm a lot better now, but I'm a bit bad with my chest. I've always been a bit bad with my chest and I've never smoked but my mates did.

You were surrounded by smokers?
Smokers is right. And every time they'd come round, I'd say you go back in the morning room. Or if we went to the pub I'd tell her to go in the lounge.

So she used to come to the pub?
Yes and we used to go on lots of holidays together then. We've been to lots of places.

Do you not go on holidays now?
No I haven't done anything since Lizzy died. That's why I miss her so much.

What do you do with yourself now then?
I go to the pub. I'm in there every day.

You go to solve the problems of the World?
Oh, yes the pubs where you sort out all your ideas.

Do you think you'll be able to manage to get there?
I don't think so. I tell you I will if the right leg improves, I'll get a wheelchair and i will then - if i have one good leg. Unfortunately the left side was the strongest part about me and that's the bit the stroke got. I'm hopeless without that leg. But I'll tell you last week I couldn't get that hand to move and now look at that. I can get me hand above me head. But i cant stand now. Downstairs (physio) i sit on a big rocking chair like this with a cushion on it and I cant get out of that chair it's too low. I can wash myself and dress myself.

All by yourself?
Not my bottom half. But i think that I'll get better. I always have that impression. I'll get better even if it takes a long time. People tell me I don't look 84.

You don't you look well. So, what do you think would help you get better?
I think it all depends on the physio. I don't think I'll get 100% better, but I'm hoping to be 50% better. You never know.

Anything else that might help.
I don't know what to think. I such an easy going sort of person, I can accept it. Nothing worries me. As long as I've got a good mop of hair. I've had it cut this week, because my daughter's a hairdresser in town.

VB

When your at home do you live on your own?
Yes, but I'm not going to live on my own. I was assessed the other week and they said that I could never go home, well look after myself, the way I am at the moment. I'm absolutely helpless. I'm going to a nursing home - I'll be going within the next 2 or 3 weeks. I'm going to have to make a new life for myself.

Have you friends that used to come to see you at home?
Yes, I have lots of friends and I've picked a home that is near where I used to live. They have been coming to see me here and they have been very good and are made up that I'm going to the "Lodge". They said they will still come and see me and anyway its an easier place to get to than here and they've been coming here.

Is this your friends?
Friends, neighbours and relatives, all three. I have quite a lot of visitors. This is a hard place to get to Broadgreen. It's not a straight forward route.

Do you think that people feel the same about you?
Well, I do - there was a friend and neighbour in yesterday and she was saying that they were all made up that I'm going to the Lodge and they said that they would take it in turns a piece and come. I feel very comforted by that.

So, you feel that your relationships will stay the same?
Well, not it the long, long, long run, but if it takes me over the next couple of months, then I wont mind.

Why not in the long term?
Well, I suppose people will get fed up going to visit. I normally go out with them. I go to a tea-dance in the village church each week. That's only over the road from the home that I'm going to, so Jean came in to see me yesterday, she said that they would get me a wheelchair, then they could wheel me over and I could go and watch the dancing and listen to the music. So that's one thing at least. But you see a lot of the relatives are over on the Wirral and its easier for them to get to Sheil Road - they can get the train to Lime Street and get a bus straight from there.

Do they come over a lot?
Oh, yes they have been quite a few times.

Did you used to see them much before you had your stroke?
Oh, yes - they used to come over - well you see I lost my husband in April of this year. It's his family - his brother and sister - that live on the Wirral and it's them who used to come over and pick both of us up and take us out. I feel quite close to them.

So have if you had a problem, who do you think you would talk to about it?
My son I think. He often comes in and he's seen to me. He lives in Rainhill, but its only 15 minutes in the car along the M62 to the Rocket. But i have another boy down in Wales, but I don't see them very much only now and again. So if i had a problem i would go to my eldest son.

If he had a problem, would he come to you?
No, I don't think he likes to bother me with things or upset me.
Then again I have my sister-in-law (my husbands brothers wife, Joyce), we're more like sisters really, so i would probably talk to her about things.

If she had a problem, would she come to you?
I think so, yes. I think they'll all keep in touch.

PM

When you had the stroke this time, what did you think was going to happen to you?
I thought that this was the end. 4 strokes in as many years. Its a lot. This is the first time i've been in this hospital. I usually stay in the Royal.

So what do you think is going to happen now?
I'm just going to take one day at a time.

What do you think is going to help you get better?
Getting home.

Do you think things will be different when you go home?
No.

Do you think that you'll have another stroke?
Oh,yes. I've always had trouble with my blood pressure - I'm on tablets now.

Do you do other things to try to keep yourself healthy?
Oh,yes. I sleep and watch the television.

Do you stay in a lot then ?
Oh, yes I stay in a lot.

Do you get out at all?
Not very much. My son and daughter take us out. They've got cars. I used to have a car before i had my second stroke. I used to drive.

I bet you miss that then?
Oh, yes. I used to take my wife to the hairdressers and the doctors and we were more independent.

Now you have to rely on somebody else?
Yes.

Sometimes people like helping - especially your family if they're close.
We are close.

What else do you think might help you get better?
We'd like to go no holidays.

Do you have friends that come round?
Yes.

Friends that you met at a social club or somewhere?
No, I have friends from Gilmoss Depot - when I drove the buses.

They still keep in touch?
Well, yes since I retired - TED does. He rings up.

He comes to see you at home?
Yes.

Has he been to see you in hospital?
Yes, every week - he comes in regular and sometimes brings the wife. He comes in at night. He takes us to the shops. He was a bus driver too at Gilmoss depot.

EU

Can you tell me about what you thought.
I thought, that in only a few weeks that I'm going to be alright, I don't think that I'm gonna lay down in hospital for nearly 6 months. I have always been healthy.

Did you not think that you might get worse?
I never thought that i would get worse and afterwards what I read in the book I realise that what I have is a bad sickness. It is frightening, it never happened to you and so you can't know.

Do you think that you know now what is going to happen?
I don't know really what is going to happen. I don't know what to think will happen to me because I'm not married. So I don't know what gonna happen to me. I got children see, not from the same mother.

So you have children that will look after you?
I have nobody to look after me. They are trying to teach me better walking, at first i was walking bad and i think that i'm not walking again. I couldn't stand up. This time I cant use my right arm.

So, you have been managing at home for a few months?
No, its only 2 1/2 weeks ago.

You were quite fit and healthy before then?
Oh yes.

You say you have children?
Yes, but they are all married.

Have you got any friends that you talk to?
Yes, I've got a friend. He sees me here. He's coming to look after me later.

So what do you think will happen?
I don't know what is going to happen to me. Only god know what is going to happen to me.

What would you like to happen?
I'd like to see that I drop dead now.

Why is that?
Well, because no health, no recovery. I will never be as I am before.

Don't you feel like you've got any better?
Yes, I feel a little bit better.

Don't you think you'll get even better?
I think so. I think so, but my own opinion is that I take one step forward then one step back.

Tell me how it will change your life.
It is certainly going to change my life. I can't go out, I can't do nothing, can only stay at home. I'm so eager to get up but this leg is dead, dead. I used to go out - I used to work in a club, a night club - I lose my job i lose everything.

Your friends are at the club?
Yes, but I'll still see my friends - maybe I can get there when I'm better, but not as the same person. I was on the door.

LC

Does it frighten you?

No. No if I let it frighten me I'd have a series more strokes. You'd push your blood pressure up if you were worrying about it all the time, so you don't. Well if you've got any sense you don't. I mean well its not sense really, its human nature - you either worry or you don't. I didn't realise what was happening to me it wasn't till later that the story came out when my husband and my son were talking to me. I my face had gone - to me it was like having scaffolding on a weak wall then they took the scaffolding away and the whole wall collapsed, the face that was. I became a dribbling old lady with an ugly face. I've been taught to do exercises by the physiotherapists and occupational therapists they say puff your cheeks out, so you do next thing they come along and you've got these puffed out cheeks and they put a finger on either side and puff the wind out that you've been collecting in your cheeks.

And that's supposed to help your cheek muscles is it?

If you drink through a straw i think it helps strengthen the facial muscles. I don't like to see people like that after strokes, for the family it must have been terrifying for them because its horrible to look at someone whose face has dropped. It would have been terrible for me watching one of my loved ones and I remember hearing them say well "what do you think it is love" - well i know what it is - see the doctor - I don't want to see the doctor - why not love - I know what it is, I just don't want it confirmed what I know, I was just too frightened to face the facts. I was the biggest coward I just didn't want them to confirm that I'd had a stroke. Next thing was, Alan sent for the doctor when I had another one. The doctor said is the breathing alright? Yeah, no problem there - well I'll come and see her later then. Not worth panicking if her breathing is OK - I said I don't want to go to hospital - Alan said, who said your going to hospital, I said well they don't leave you at home with a stroke, they never left my mum at home with a stroke. No that was years ago he said - yes i know i said but its still a stroke is a stroke. So, he came to the house and made me stand on my toes with my arms spread out, the doctor, the GP, with my eyes closed and i kept my balance quite well actually for a stroke patient. He said to my son, you do it. My son, said he must have known I'd been out on the Saturday night and had a couple of pints of lager last night and I suppose that's why he asked me - he just wobbled from side to side - he said that was a dirty trick for the doctor to do.

So what do you think is going to happen now?

Well, please God I'm going to go from strength to strength. I am improving. I'm told that at the time my speech was affected. I never knew this, I don't remember it. I know I dribble like a baby even now. You can feel it running down your face. People say its good that you can feel it it means you've got sensation there. People come along and stick sharp things in and say can you feel that, can you feel that, all down the left side because it was the right side of my brain that was damaged with the blood.

So what do you think would help you to get better?

Well, I there are so many people that I owe a debt of gratitude to that have helped me marvellously - Starting with my husband, my son, they've all helped me so much - I'm crying for myself I'm just selfish, so selfish. They've been so good to me at the Royal and here - I stood for the first time with Paula yesterday. The physiotherapists and occupational therapists have helped me more than anyone - they have all been absolutely wonderful. They've helped me, given me strength and my husband and my son. I go home at weekends - they transfer me from wheelchair to commode and back again. I have to have help to go to the toilet - I have to stand up - in your mind you can walk as you did before you had the stroke - but you know because common sense tells you that if you stand up your going to fall flat on your face.

So your still having trouble standing?

Yes, I'm only just learning - yesterday I stood for the 1st time in 4 months, September, Oct, Nov, Dec, Jan. - 4 months. It was the first time i stood alone yesterday - the young physiotherapist, the Yorkshire lad - Craig- he's taught me how to stand- how to move myself to get out of the chair without pushing or holding onto something or being pulled up by somebody - just grip your 2 hands together, bring your head down, bend in the middle pull forward and pull yourself up by your hands in front. They hold you, they walked me, I've taken my first steps with them - that was such an achievement you feel wonderful.

APPENDIX 4

Table of themes, sub-themes, statements and item number

Theme	Sub-Theme	Item/Statement
MOTIVATION	Planning	Having plans for the future (holidays, jobs)
	Trying	Trying hard will help
	Determination	My own determination will help me
	Perceived Control	Believing that no matter what happens I can get through it
COPING	Problem Solving	Doing what has to be done, one step at a time
	Emotional Discharge	Letting my emotions out
	Avoidance/Denial	Ignoring the problems
	Acceptance	Just accepting the way things are
SELF-ESTEEM	Person Acceptance	Being happy with just being myself
	Body Acceptance	Accepting my body and the way that I look
	Confidence/Efficacy	Believing/Knowing that I can do most things that I set my mind to
	Self-worth	Remembering that I am still a worthwhile person
MOOD/AFFECT	Depression free	Keeping cheerful
	Anxiety free	Trying not to worry or get tense about things
	Hopeful	Staying hopeful
	Anger free	Not getting cross
FATE	Chance/luck	Believing that my future depends on luck
	Destiny	Believing that whatever is meant to be will be
	Inevitable	Knowing that we all have to die of something sometime
	God	Putting myself into God's hands
TREATMENT	Conventional	Medicine, tablets and physiotherapy
	Alternative	Relaxation, massage or aromatherapy
	Formal	Help and advice from health professionals
	Informal	Help and support from family and friends
FUNCTION	BADL (movement)	Being able to just walk again
	BADL (control)	Being able to control my bodily functions
	Cognitive ADL	Being capable of making my own decisions
	IADL	Being able to sort out my own bills,phone,laundry etc
BEHAVIOUR	Vocational Activities	Finding some work/hobbies that I really enjoy
	Social Activities	Getting out and about with my friends (socialising)
	Lifestyle	Changing my lifestyle (the way I live)
	Habits	Giving up unhealthy habits (smoking/alcohol/chips etc)
ENVIRONMENTAL	Adaptations	I will have my home adapted to make it suitable for me
	Aids	I will have gadgets and walking aids
	Allowances	I will have extra allowances (money)
	Location	I will have somewhere suitable to live
COGNITIVE	Memory (Autobiographical)	I will be able to remember incidents and facts from when I was younger
	Memory (Current)	I will be able to remember day to day facts e.g. names, faces, etc.
	Concentration	I'll be able to concentrate on important facts
	Perception	I'll be able to see, hear and understand what is going on around me
INTERPERSONAL RELATIONSHIPS	Advisor	My family and friends will seek out my opinions
	Loved/Cared for	My family and friends will want to come to see me (not just out of duty)
	Confidant	I will have someone to talk to about my private feelings
	Esteemed/Valued	My family and friends will think that I have something worthwhile to say.

APPENDIX 5

Comparison of themes and sub-themes

Theme	Sub-Theme	Mean	SD	25%ile	75%ile
MOTIVATION	Planning	7.7	1.50	6	9
	Trying	8.6	1.27	8	9
	Determination	9.3	0.76	9	10
	Perceived Control	8.4	0.98	8	9
COPING	Problem Solving	8.3	1.11	7	9
	Emotional Discharge	7.1	2.27	5	10
	Avoidance/Denial	5.9	3.19	4	8
	Acceptance	7.7	1.80	6	9
SELF-ESTEEM	Person Acceptance	8.9	1.35	9	10
	Body Acceptance	9.0	1.41	9	10
	Confidence/Efficacy	9.0	0.82	8	10
	Self-worth	9.6	0.54	9	10
MOOD/AFFECT	Depression free	8.1	2.12	6	10
	Anxiety free	8.1	2.12	6	10
	Hopeful	7.1	2.27	5	9
	Anger free	8.1	2.12	6	10
FATE	Chance/luck	9.4	0.54	9	10
	Destiny	9.6	0.54	9	10
	Inevitable	9.6	0.54	9	10
	God	7.6	1.72	6	9
TREATMENT	Conventional	9.6	0.54	9	10
	Alternative	8.4	2.07	6	10
	Formal	9.1	0.69	9	10
	Informal	8.3	2,36	6	10
FUNCTION	BADL (movement)	9.7	0.49	9	10
	BADL (control)	9.6	0.79	9	10
	Cognitive ADL	9.3	1.25	8	10
	IADL	8.4	1.51	7	10
BEHAVIOUR	Vocational Activities	8.1	1.68	7	10
	Social Activities	8.1	1.95	6	10
	Lifestyle	8.4	1.72	8	10
	Habits	9.0	0.82	8	10

Comparison of sub-themes and items

Sub-Theme	Item/Statement	Mean	SD	25%ile	75%ile
Planning	Having plans for the future (holidays,jobs)	9.6	0.79	9	10
Trying	Trying hard will help	9.4	0.79	9	10
Determination	My own determination will help me	9.6	0.79	9	10
Perceived Control	Believing that no matter what happens I can get through it	9.1	0.90	8	10
Problem Solving	Doing what has to be done, one step at a time	7.3	2.75	6	10
Emotional Discharge	Letting my emotions out	9.1	1.22	8	10
Avoidance/Denial	Ignoring the problems	8.9	1.46	8	10
Acceptance	Just accepting the way things are	8.4	1.40	8	10
Person Acceptance	Being happy with just being myself	9.6	0.54	9	10
Body Acceptance	Accepting my body and the way that I look	9.9	0.38	10	10
Confidence/Efficacy	Believing/Knowing that I can do most things that I set my mind to	8.9	1.35	9	10
Self-worth	Remembering that I am still a worthwhile person	9.0	1.73	7	10
Depression free	Keeping cheerful	8.4	1.13	8	10
Anxiety free	Trying not to worry or get tense about things	9.0	1.16	8	10
Hopeful	Staying hopeful	9.1	1.86	9	10
Anger free	Not getting cross	9.1	1.07	8	10
Chance/luck	Believing that my future depends on luck	9.6	0.54	9	10
Destiny	Believing that whatever is meant to be will be	9.7	0.49	9	10
Inevitable	Knowing that we all have to die of something sometime	8.3	2.87	8	10
God	Putting myself into God's hands	9.6	0.79	9	10
Conventional	Medicine, tablets and physiotherapy	9.6	1.13	10	10
Alternative	Relaxation, massage or aromatherapy	8.7	2.22	8	10
Formal	Help and advice from health professionals	9.1	1.57	8	10
Informal	Help and support from family and friends	9.4	0.79	9	10
BADL (movement)	Being able to just walk again	8.6	1.40	7	10
BADL (control)	Being able to control my bodily functions	9.1	0.90	8	10
Cognitive ADL	Being capable of making my own decisions	8.9	1.46	8	10
IADL	Being able to sort out my own bills,phone,laundry etc	9.4	0.79	9	10
Vocational Activities	Finding some work/hobbies that I really enjoy	9.1	1.86	9	10
Social Activities	Getting out and about with my friends (socialising)	9.0	1.16	8	10
Lifestyle	Changing my lifestyle (the way I live)	8.3	2.87	8	10
Habits	Giving up unhealthy habits (smoking/alcohol/chips etc)	8.6	1.51	8	10

Comparison of themes and items

Theme		Item/Statement	Mean	SD	25%ile	75%ile
MOTIVATION		Having plans for the future (holidays,jobs)	8.0	1.63	7	9
		Trying hard will help	9.0	0.58	9	9
		My own determination will help me	9.7	0.49	9	10
		Believing that no matter what happens I can get through it	9.1	0.90	8	10
COPING		Doing what has to be done, one step at a time	7.7	1.38	7	9
		Letting my emotions out	7.7	2.14	5	10
		Ignoring the problems	6.7	3.30	5	10
		Just accepting the way things are	7.3	1.60	6	9
SELF-ESTEEM		Being happy with just being myself	9.1	0.69	9	10
		Accepting my body and the way that I look	9.3	0.95	8	10
		Believing/Knowing that I can do most things that I set my mind to	9.3	1.50	9	10
		Remembering that I am still a worthwhile person	9.3	1.50	9	10
MOOD/AFFECT		Keeping cheerful	8.1	1.95	6	10
		Trying not to worry or get tense about things	8.1	1.95	6	10
		Staying hopeful	7.4	2.07	5	10
		Not getting cross	8.3	2.06	6	10
FATE		Believing that my future depends on luck	9.4	0.54	9	10
		Believing that whatever is meant to be will be	9.6	0.54	9	10
		Knowing that we all have to die of something sometime	7.9	2.67	8	10
		Putting myself into God's hands	8.1	1.68	7	9
TREATMENT		Medicine, tablets and physiotherapy	10	0.00	10	10
		Relaxation, massage or aromatherapy	8.4	2.37	5	10
		Help and advice from health professionals	8.6	1.51	8	10
		Help and support from family and friends	7.4	2.51	5	10
FUNCTION		Being able to just walk again	9.3	1.11	9	10
		Being able to control my bodily functions	9.3	1.11	9	10
		Being capable of making my own decisions	8.6	1.62	7	10
		Being able to sort out my own bills,phone,laundry etc	8.7	1.60	7	10
BEHAVIOUR		Finding some work/hobbies that I really enjoy	7.6	1.99	6	10
		Getting out and about with my friends (socialising)	8.3	1.70	6	10
		Changing my lifestyle (the way I live)	8.3	1.70	6	10
		Giving up unhealthy habits (smoking/alcohol/chips etc)	8.3	1.25	8	9

NB. BADL = Basic activities of daily living, IADL = instrumental activities of daily living etc.

APPENDIX 6

Table of themes, sub-themes, statements and item number

Theme	Sub-Theme	Item/Statement	Question
MOTIVATION	Planning	Having plans for the future (holidays, jobs)	24
	Trying	Trying hard will help	16
	Determination	My own determination will help me	36
	Perceived Control	Believing that no matter what happens I can get through it	12
COPING	Problem Solving	Doing what has to be done, one step at a time	38
	Emotional Discharge	Letting my emotions out	19
	Avoidance/Denial	Ignoring the problems	29
	Acceptance	Just accepting the way things are	11
SELF-ESTEEM	Person Acceptance	Being happy with just being myself	44
	Body Acceptance	Accepting my body and the way that I look	30
	Confidence/Efficacy	Believing/Knowing that I can do most things that I set my mind to	17
	Self-worth	Remembering that I am still a worthwhile person	3
MOOD/AFFECT	Depression free	Keeping cheerful	6
	Anxiety free	Trying not to worry or get tense about things	39
	Hopeful	Staying hopeful	4
	Anger free	Not getting cross	21
FATE	Chance/luck	Believing that my future depends on luck	31
	Destiny	Believing that whatever is meant to be will be	18
	Inevitable	Knowing that we all have to die of something sometime	23
	God	Putting myself into God's hands	10
TREATMENT	Conventional	Medicine, tablets and physiotherapy	25
	Alternative	Relaxation, massage or aromatherapy	2
	Formal	Help and advice from health professionals	26
	Informal	Help and support from family and friends	20
FUNCTION	BADL (movement)	Being able to just walk again	13
	BADL (control)	Being able to control my bodily functions	34
	Cognitive ADL	Being capable of making my own decisions	41
	IADL	Being able to sort out my own bills,phone,laundry etc	40
BEHAVIOUR	Vocational Activities	Finding some work/hobbies that I really enjoy	7
	Social Activities	Getting out and about with my friends (socialising)	37
	Lifestyle	Changing my lifestyle (the way I live)	15
	Habits	Giving up unhealthy habits (smoking/alcohol/chips etc)	32
ENVIRONMENTAL	Adaptations	I will have my home adapted to make it suitable for me	5
	Aids	I will have gadgets and walking aids	9
	Allowances	I will have extra allowances (money)	42
	Location	I will have somewhere suitable to live	35
COGNITIVE	Memory (Autobiographical)	I will be able to remember incidents and facts from when I was younger	14
	Memory (Current)	I will be able to remember day to day facts e.g. names, faces, etc.	33
	Concentration	I'll be able to concentrate on important facts	43
	Perception	I'll be able to see, hear and understand what is going on around me	28
INTERPERSONAL RELATIONSHIPS	Advisor	My family and friends will seek out my opinions	27
	Loved/Cared for	My family and friends will want to come to see me (not just out of duty)	8
	Confidant	I will have someone to talk to about my private feelings	1
	Esteemed/Valued	My family and friends will think that I have something worthwhile to say.	22

APPENDIX 7

Frequencies of Response for SEQ Help at week2

	1	2	3	4	5	Total
	Frequency	Frequency	Frequency	Frequency	Frequency	Frequency
A1	20	10	14	40	94	178
A2	44	12	32	35	50	173
A3	4	5	10	44	114	177
A4	3	3	4	42	126	178
A5	46	14	17	27	72	176
A6	1	1	6	38	132	178
A7	24	8	14	33	99	178
A8	3	2	4	37	132	178
A9	36	8	25	40	68	177
A10	48	6	13	21	90	178
A11	34	13	29	39	62	177
A12	6	4	14	40	114	178
A13	8	1	4	21	143	177
A14	25	9	15	38	91	178
A15	94	21	23	13	24	175
A16	7	3	13	47	108	178
A17	4	3	12	51	107	177
A18	17	8	25	44	84	178
A19	12	16	31	44	75	178
A20	4	2	4	34	134	178
A21	17	15	40	41	65	178
A22	7	1	8	45	117	178

Frequencies of Response for SEQ Help at week2

	1	2	3	4	5	Total
	Frequency	Frequency	Frequency	Frequency	Frequency	Frequency
A23	17	6	18	44	93	178
A24	37	12	22	42	60	173
A25	3	5	9	47	113	177
A26	3	2	3	43	127	178
A27	45	11	18	30	72	176
A28	2	1	5	33	137	178
A29	33	14	20	33	78	178
A30	10	5	4	40	119	178
A31	41	11	28	35	62	177
A32	38	7	13	30	90	178
A33	30	12	20	33	82	177
A34	7	4	8	38	120	177
A35	7	1	3	28	138	177
A36	21	5	14	47	91	178
A37	72	14	23	27	39	175
A38	7	2	12	49	108	178
A39	5	2	15	52	103	177
A40	17	4	20	46	91	178
A41	10	10	21	48	89	178
A42	7	10	8	31	121	177
A43	20	9	34	32	83	178
A44	6	4	13	38	117	178

Frequencies of Response for SEQ Happen at week2

	1	2	3	4	5	Total
	Frequency	Frequency	Frequency	Frequency	Frequency	Frequency
B1	12	11	14	35	105	177
B2	53	44	29	20	26	172
B3	12	5	19	39	101	176
B4	3	9	16	36	112	176
B5	64	15	31	20	44	174
B6	3	5	22	59	88	177
B7	32	13	26	37	69	177
B8	3	1	13	36	122	175
B9	46	15	31	31	52	175
B10	43	6	17	19	92	177
B11	32	10	34	44	57	177
B12	8	2	20	39	108	177
B13	21	4	19	34	98	176
B14	5	13	21	38	100	177
B15	109	17	12	17	21	176
B16	8	5	10	42	112	177
B17	6	5	25	47	94	177
B18	13	3	21	42	97	176
B19	22	26	27	34	68	177
B20	4	3	8	30	132	177
B21	22	30	56	40	29	177
B22	10	7	24	40	96	177

Frequencies of Response for SEQ Happen at week2

	1	2	3	4	5	Total
	Frequency	Frequency	Frequency	Frequency	Frequency	Frequency
B23	17	3	16	26	115	177
B24	42	20	21	34	60	177
B25	10	4	32	39	91	176
B26	13	8	35	45	76	177
B27	12	13	24	42	86	177
B28		4	12	38	122	176
B29	59	28	43	22	25	177
B30	11	2	22	53	88	176
B31	69	22	21	17	46	175
B32	59	10	28	26	54	177
B33	4	8	32	44	89	177
B34	1	3	17	41	114	176
B35	3	1	6	28	138	176
B36	5	4	12	41	115	177
B37	26	18	26	41	66	177
B38	5	4	15	52	101	177
B39	21	16	50	50	40	177
B40	16	10	20	36	95	177
B41	3	2	11	36	123	175
B42	75	26	39	22	12	174
B43	4	3	22	45	103	177
B44	7	6	9	29	126	177

APPENDIX 8

Inter-item Correlations for SEQ Help scores at week2

Correlations

		A1	A2	A3	A4	A5	A6
A1	Pearson Correlation	1.000	.171*	.262**	.162*	.183*	.100
	Sig. (2-tailed)	.	.024	.000	.031	.015	.185
	N	178	173	177	178	176	178
A2	Pearson Correlation	.171*	1.000	.088	.078	.056	.061
	Sig. (2-tailed)	.024	.	.250	.309	.471	.422
	N	173	173	172	173	171	173
A3	Pearson Correlation	.262**	.088	1.000	.524**	-.044	.359**
	Sig. (2-tailed)	.000	.250	.	.000	.559	.000
	N	177	172	177	177	175	177
A4	Pearson Correlation	.162*	.078	.524**	1.000	-.018	.545**
	Sig. (2-tailed)	.031	.309	.000	.	.809	.000
	N	178	173	177	178	176	178
A5	Pearson Correlation	.183*	.056	-.044	-.018	1.000	.055
	Sig. (2-tailed)	.015	.471	.559	.809	.	.469
	N	176	171	175	176	176	176
A6	Pearson Correlation	.100	.061	.359**	.545**	.055	1.000
	Sig. (2-tailed)	.185	.422	.000	.000	.469	.
	N	178	173	177	178	176	178
A7	Pearson Correlation	.015	-.003	.203**	.323**	.093	.375**
	Sig. (2-tailed)	.847	.967	.007	.000	.218	.000
	N	178	173	177	178	176	178
A8	Pearson Correlation	.163*	.118	.224**	.277**	.078	.157*
	Sig. (2-tailed)	.030	.122	.003	.000	.304	.036
	N	178	173	177	178	176	178
A9	Pearson Correlation	.040	.058	-.047	-.029	.300**	-.018
	Sig. (2-tailed)	.601	.446	.538	.701	.000	.809
	N	177	172	176	177	176	177
A10	Pearson Correlation	.094	-.007	.110	.113	.044	.188*
	Sig. (2-tailed)	.212	.927	.143	.133	.563	.012
	N	178	173	177	178	176	178
A11	Pearson Correlation	.096	-.046	.136	.102	-.046	.057
	Sig. (2-tailed)	.206	.547	.072	.175	.543	.452
	N	177	172	176	177	175	177
A12	Pearson Correlation	.094	.072	.352**	.450**	.042	.408**
	Sig. (2-tailed)	.212	.348	.000	.000	.578	.000
	N	178	173	177	178	176	178
A13	Pearson Correlation	.031	-.021	.072	.066	.268**	.014
	Sig. (2-tailed)	.678	.780	.345	.380	.000	.857
	N	177	172	176	177	175	177
A14	Pearson Correlation	.170*	-.024	.208**	.226**	.020	.281**
	Sig. (2-tailed)	.023	.758	.005	.002	.787	.000
	N	178	173	177	178	176	178
A15	Pearson Correlation	.092	-.061	.227**	.155*	.039	.036
	Sig. (2-tailed)	.225	.425	.003	.041	.612	.637
	N	175	171	174	175	174	175
A16	Pearson Correlation	.182*	.036	.380**	.481**	.084	.294**
	Sig. (2-tailed)	.015	.637	.000	.000	.266	.000
	N	178	173	177	178	176	178
A17	Pearson Correlation	.103	.060	.291**	.439**	-.021	.447**
	Sig. (2-tailed)	.174	.435	.000	.000	.782	.000
	N	177	172	176	177	175	177
A18	Pearson Correlation	.171*	-.009	.001	.090	-.018	.116
	Sig. (2-tailed)	.023	.904	.991	.231	.816	.124
	N	178	173	177	178	176	178

Correlations

		A1	A2	A3	A4	A5	A6
A19	Pearson Correlation	.103	.113	.226**	.238**	.007	.279**
	Sig. (2-tailed)	.170	.139	.002	.001	.928	.000
	N	178	173	177	178	176	178
A20	Pearson Correlation	.164*	.045	.150*	.079	-.041	.237**
	Sig. (2-tailed)	.029	.560	.046	.293	.593	.001
	N	178	173	177	178	176	178
A21	Pearson Correlation	.016	.062	.143	.054	-.024	.049
	Sig. (2-tailed)	.833	.421	.058	.470	.748	.514
	N	178	173	177	178	176	178
A22	Pearson Correlation	.194**	.078	.449**	.441**	.076	.300**
	Sig. (2-tailed)	.010	.308	.000	.000	.315	.000
	N	178	173	177	178	176	178
A23	Pearson Correlation	.714**	.100	.138	.241**	.184*	.155*
	Sig. (2-tailed)	.000	.192	.066	.001	.014	.038
	N	178	173	177	178	176	178
A24	Pearson Correlation	.210**	.783**	.082	.159*	.112	.124
	Sig. (2-tailed)	.006	.000	.282	.037	.144	.105
	N	173	173	172	173	171	173
A25	Pearson Correlation	.164*	.059	.790**	.571**	.021	.356**
	Sig. (2-tailed)	.030	.439	.000	.000	.782	.000
	N	177	172	177	177	175	177
A26	Pearson Correlation	.186*	.087	.498**	.892**	.039	.561**
	Sig. (2-tailed)	.013	.253	.000	.000	.609	.000
	N	178	173	177	178	176	178
A27	Pearson Correlation	.186*	.013	-.001	.027	.889**	.042
	Sig. (2-tailed)	.014	.863	.988	.722	.000	.578
	N	176	171	175	176	176	176
A28	Pearson Correlation	.138	.049	.420**	.471**	.010	.858**
	Sig. (2-tailed)	.066	.524	.000	.000	.895	.000
	N	178	173	177	178	176	178
A29	Pearson Correlation	.024	-.029	.210**	.306**	-.025	.269**
	Sig. (2-tailed)	.749	.708	.005	.000	.738	.000
	N	178	173	177	178	176	178
A30	Pearson Correlation	.300**	.089	.330**	.413**	.009	.170*
	Sig. (2-tailed)	.000	.245	.000	.000	.911	.023
	N	178	173	177	178	176	178
A31	Pearson Correlation	.017	.007	-.046	.024	.164*	.019
	Sig. (2-tailed)	.823	.926	.541	.751	.029	.803
	N	177	172	176	177	176	177
A32	Pearson Correlation	.170*	.007	.051	-.002	.055	.145
	Sig. (2-tailed)	.023	.925	.497	.983	.471	.054
	N	178	173	177	178	176	178
A33	Pearson Correlation	.051	-.092	.073	.103	.011	.062
	Sig. (2-tailed)	.497	.231	.337	.173	.884	.416
	N	177	172	176	177	175	177
A34	Pearson Correlation	.063	-.004	.205**	.384**	-.003	.342**
	Sig. (2-tailed)	.405	.961	.006	.000	.966	.000
	N	177	172	176	177	175	177
A35	Pearson Correlation	.028	-.064	.078	.083	.239**	.063
	Sig. (2-tailed)	.709	.407	.301	.273	.001	.408
	N	177	172	176	177	175	177
A36	Pearson Correlation	.109	-.040	.112	.075	.051	.288**
	Sig. (2-tailed)	.147	.600	.138	.320	.503	.000
	N	178	173	177	178	176	178

Correlations

		A1	A2	A3	A4	A5	A6
A37	Pearson Correlation	-.031	-.110	.121	.049	.169*	.054
	Sig. (2-tailed)	.689	.152	.112	.520	.025	.475
	N	175	171	174	175	174	175
A38	Pearson Correlation	.190*	.035	.333**	.355**	.068	.253**
	Sig. (2-tailed)	.011	.651	.000	.000	.370	.001
	N	178	173	177	178	176	178
A39	Pearson Correlation	.149*	.064	.250**	.372**	-.055	.364**
	Sig. (2-tailed)	.047	.404	.001	.000	.471	.000
	N	177	172	176	177	175	177
A40	Pearson Correlation	.159*	.017	-.051	-.007	.003	.107
	Sig. (2-tailed)	.034	.823	.502	.925	.973	.155
	N	178	173	177	178	176	178
A41	Pearson Correlation	.007	.030	.137	.172*	.035	.256**
	Sig. (2-tailed)	.924	.695	.069	.022	.643	.001
	N	178	173	177	178	176	178
A42	Pearson Correlation	.164*	.084	.152*	.189*	-.024	.197**
	Sig. (2-tailed)	.029	.276	.044	.012	.757	.009
	N	177	172	176	177	175	177
A43	Pearson Correlation	-.030	-.011	.111	.143	.024	.125
	Sig. (2-tailed)	.686	.889	.142	.058	.749	.098
	N	178	173	177	178	176	178
A44	Pearson Correlation	.244**	.046	.517**	.525**	.058	.309**
	Sig. (2-tailed)	.001	.548	.000	.000	.443	.000
	N	178	173	177	178	176	178

Correlations

		A7	A8	A9	A10	A11	A12
A1	Pearson Correlation	.015	.163*	.040	.094	.096	.094
	Sig. (2-tailed)	.847	.030	.601	.212	.206	.212
	N	178	178	177	178	177	178
A2	Pearson Correlation	-.003	.118	.058	-.007	-.046	.072
	Sig. (2-tailed)	.967	.122	.446	.927	.547	.348
	N	173	173	172	173	172	173
A3	Pearson Correlation	.203**	.224**	-.047	.110	.136	.352**
	Sig. (2-tailed)	.007	.003	.538	.143	.072	.000
	N	177	177	176	177	176	177
A4	Pearson Correlation	.323**	.277**	-.029	.113	.102	.450**
	Sig. (2-tailed)	.000	.000	.701	.133	.175	.000
	N	178	178	177	178	177	178
A5	Pearson Correlation	.093	.078	.300**	.044	-.046	.042
	Sig. (2-tailed)	.218	.304	.000	.563	.543	.578
	N	176	176	176	176	175	176
A6	Pearson Correlation	.375**	.157*	-.018	.188*	.057	.408**
	Sig. (2-tailed)	.000	.036	.809	.012	.452	.000
	N	178	178	177	178	177	178
A7	Pearson Correlation	1.000	.139	-.023	-.010	.010	.257**
	Sig. (2-tailed)	.	.065	.760	.895	.891	.001
	N	178	178	177	178	177	178
A8	Pearson Correlation	.139	1.000	.199**	.156*	.085	.112
	Sig. (2-tailed)	.065	.	.008	.038	.258	.138
	N	178	178	177	178	177	178
A9	Pearson Correlation	-.023	.199**	1.000	.119	.111	-.039
	Sig. (2-tailed)	.760	.008	.	.114	.142	.610
	N	177	177	177	177	176	177
A10	Pearson Correlation	-.010	.156*	.119	1.000	.169*	.057
	Sig. (2-tailed)	.895	.038	.114	.	.025	.451
	N	178	178	177	178	177	178
A11	Pearson Correlation	.010	.085	.111	.169*	1.000	.024
	Sig. (2-tailed)	.891	.258	.142	.025	.	.751
	N	177	177	176	177	177	177
A12	Pearson Correlation	.257**	.112	-.039	.057	.024	1.000
	Sig. (2-tailed)	.001	.138	.610	.451	.751	.
	N	178	178	177	178	177	178
A13	Pearson Correlation	.002	.052	.141	.093	.134	.110
	Sig. (2-tailed)	.975	.496	.063	.219	.077	.146
	N	177	177	176	177	176	177
A14	Pearson Correlation	.090	.053	.019	.234**	.209**	.304**
	Sig. (2-tailed)	.232	.481	.806	.002	.005	.000
	N	178	178	177	178	177	178
A15	Pearson Correlation	.207**	.075	-.047	-.038	.043	.095
	Sig. (2-tailed)	.006	.321	.540	.617	.573	.212
	N	175	175	175	175	175	175
A16	Pearson Correlation	.231**	.211**	-.037	.115	.104	.402**
	Sig. (2-tailed)	.002	.005	.622	.128	.169	.000
	N	178	178	177	178	177	178
A17	Pearson Correlation	.377**	.162*	-.090	.041	.099	.491**
	Sig. (2-tailed)	.000	.031	.233	.589	.192	.000
	N	177	177	176	177	176	177
A18	Pearson Correlation	-.025	.037	.058	.226**	.387**	.114
	Sig. (2-tailed)	.741	.628	.439	.002	.000	.129
	N	178	178	177	178	177	178

Correlations

		A7	A8	A9	A10	A11	A12
A19	Pearson Correlation	.170*	.071	.019	.122	.136	.261**
	Sig. (2-tailed)	.023	.349	.799	.104	.070	.000
	N	178	178	177	178	177	178
A20	Pearson Correlation	.171*	.276**	-.058	.095	.171*	.167*
	Sig. (2-tailed)	.022	.000	.443	.209	.023	.025
	N	178	178	177	178	177	178
A21	Pearson Correlation	.100	.066	.093	.159*	.179*	.198**
	Sig. (2-tailed)	.182	.384	.216	.034	.017	.008
	N	178	178	177	178	177	178
A22	Pearson Correlation	.186*	.335**	-.091	.175*	.178*	.455**
	Sig. (2-tailed)	.013	.000	.228	.019	.018	.000
	N	178	178	177	178	177	178
A23	Pearson Correlation	.016	.194**	-.038	.174*	.133	.110
	Sig. (2-tailed)	.830	.010	.618	.021	.078	.145
	N	178	178	177	178	177	178
A24	Pearson Correlation	.116	.102	.001	.016	.017	.097
	Sig. (2-tailed)	.128	.180	.985	.835	.821	.204
	N	173	173	172	173	172	173
A25	Pearson Correlation	.256**	.272**	.009	.029	.088	.355**
	Sig. (2-tailed)	.001	.000	.902	.705	.245	.000
	N	177	177	176	177	176	177
A26	Pearson Correlation	.370**	.315**	-.011	.077	.103	.433**
	Sig. (2-tailed)	.000	.000	.883	.307	.174	.000
	N	178	178	177	178	177	178
A27	Pearson Correlation	.092	.087	.203**	.014	-.037	.038
	Sig. (2-tailed)	.223	.250	.007	.858	.626	.617
	N	176	176	176	176	175	176
A28	Pearson Correlation	.329**	.091	-.015	.159*	.057	.390**
	Sig. (2-tailed)	.000	.227	.841	.034	.451	.000
	N	178	178	177	178	177	178
A29	Pearson Correlation	.746**	.181*	-.015	.005	.016	.239**
	Sig. (2-tailed)	.000	.016	.847	.947	.834	.001
	N	178	178	177	178	177	178
A30	Pearson Correlation	.149*	.606**	.126	.198**	.163*	.217**
	Sig. (2-tailed)	.047	.000	.094	.008	.030	.004
	N	178	178	177	178	177	178
A31	Pearson Correlation	.020	.216**	.694**	.168*	.207**	-.013
	Sig. (2-tailed)	.796	.004	.000	.025	.006	.860
	N	177	177	177	177	176	177
A32	Pearson Correlation	.020	.066	.092	.764**	.143	.008
	Sig. (2-tailed)	.791	.380	.221	.000	.057	.916
	N	178	178	177	178	177	178
A33	Pearson Correlation	.069	.065	.101	.063	.815**	.021
	Sig. (2-tailed)	.360	.392	.182	.403	.000	.782
	N	177	177	176	177	177	177
A34	Pearson Correlation	.227**	.071	-.068	-.035	.042	.851**
	Sig. (2-tailed)	.002	.345	.372	.642	.582	.000
	N	177	177	176	177	176	177
A35	Pearson Correlation	.065	.068	.053	.085	.194**	.104
	Sig. (2-tailed)	.387	.366	.486	.263	.010	.166
	N	177	177	176	177	176	177
A36	Pearson Correlation	.086	.060	-.028	.226**	.187*	.228**
	Sig. (2-tailed)	.252	.428	.709	.002	.013	.002
	N	178	178	177	178	177	178

Correlations

		A7	A8	A9	A10	A11	A12
A37	Pearson Correlation	.245**	.050	-.117	-.048	-.020	.096
	Sig. (2-tailed)	.001	.514	.122	.530	.789	.206
	N	175	175	175	175	175	175
A38	Pearson Correlation	.240**	.184*	-.060	.060	.148*	.300**
	Sig. (2-tailed)	.001	.014	.428	.426	.050	.000
	N	178	178	177	178	177	178
A39	Pearson Correlation	.288**	.157*	-.082	.019	.157*	.416**
	Sig. (2-tailed)	.000	.037	.281	.803	.038	.000
	N	177	177	176	177	176	177
A40	Pearson Correlation	-.037	.032	.037	.207**	.408**	.083
	Sig. (2-tailed)	.622	.672	.626	.005	.000	.269
	N	178	178	177	178	177	178
A41	Pearson Correlation	.168*	.035	-.023	.059	.080	.143
	Sig. (2-tailed)	.025	.639	.757	.431	.289	.057
	N	178	178	177	178	177	178
A42	Pearson Correlation	.110	.266**	.083	.085	.088	.260**
	Sig. (2-tailed)	.146	.000	.274	.260	.246	.000
	N	177	177	176	177	176	177
A43	Pearson Correlation	.202**	.066	.058	.145	.142	.218**
	Sig. (2-tailed)	.007	.382	.446	.053	.059	.003
	N	178	178	177	178	177	178
A44	Pearson Correlation	.206**	.281**	-.089	.195**	.200**	.460**
	Sig. (2-tailed)	.006	.000	.238	.009	.008	.000
	N	178	178	177	178	177	178

Correlations

		A13	A14	A15	A16	A17	A18
A1	Pearson Correlation	.031	.170*	.092	.182*	.103	.171*
	Sig. (2-tailed)	.678	.023	.225	.015	.174	.023
	N	177	178	175	178	177	178
A2	Pearson Correlation	-.021	-.024	-.061	.036	.060	-.009
	Sig. (2-tailed)	.780	.758	.425	.637	.435	.904
	N	172	173	171	173	172	173
A3	Pearson Correlation	.072	.208**	.227**	.380**	.291**	.001
	Sig. (2-tailed)	.345	.005	.003	.000	.000	.991
	N	176	177	174	177	176	177
A4	Pearson Correlation	.066	.226**	.155*	.481**	.439**	.090
	Sig. (2-tailed)	.380	.002	.041	.000	.000	.231
	N	177	178	175	178	177	178
A5	Pearson Correlation	.268**	.020	.039	.084	-.021	-.018
	Sig. (2-tailed)	.000	.787	.612	.266	.782	.816
	N	175	176	174	176	175	176
A6	Pearson Correlation	.014	.281**	.036	.294**	.447**	.116
	Sig. (2-tailed)	.857	.000	.637	.000	.000	.124
	N	177	178	175	178	177	178
A7	Pearson Correlation	.002	.090	.207**	.231**	.377**	-.025
	Sig. (2-tailed)	.975	.232	.006	.002	.000	.741
	N	177	178	175	178	177	178
A8	Pearson Correlation	.052	.053	.075	.211**	.162*	.037
	Sig. (2-tailed)	.496	.481	.321	.005	.031	.628
	N	177	178	175	178	177	178
A9	Pearson Correlation	.141	.019	-.047	-.037	-.090	.058
	Sig. (2-tailed)	.063	.806	.540	.622	.233	.439
	N	176	177	175	177	176	177
A10	Pearson Correlation	.093	.234**	-.038	.115	.041	.226**
	Sig. (2-tailed)	.219	.002	.617	.128	.589	.002
	N	177	178	175	178	177	178
A11	Pearson Correlation	.134	.209**	.043	.104	.099	.387**
	Sig. (2-tailed)	.077	.005	.573	.169	.192	.000
	N	176	177	175	177	176	177
A12	Pearson Correlation	.110	.304**	.095	.402**	.491**	.114
	Sig. (2-tailed)	.146	.000	.212	.000	.000	.129
	N	177	178	175	178	177	178
A13	Pearson Correlation	1.000	.189*	.032	.226**	.110	.046
	Sig. (2-tailed)	.	.012	.676	.002	.145	.540
	N	177	177	174	177	176	177
A14	Pearson Correlation	.189*	1.000	-.009	.275**	.237**	.422**
	Sig. (2-tailed)	.012	.	.910	.000	.001	.000
	N	177	178	175	178	177	178
A15	Pearson Correlation	.032	-.009	1.000	.111	.101	-.094
	Sig. (2-tailed)	.676	.910	.	.144	.183	.214
	N	174	175	175	175	174	175
A16	Pearson Correlation	.226**	.275**	.111	1.000	.477**	.094
	Sig. (2-tailed)	.002	.000	.144	.	.000	.211
	N	177	178	175	178	177	178
A17	Pearson Correlation	.110	.237**	.101	.477**	1.000	.177*
	Sig. (2-tailed)	.145	.001	.183	.000	.	.019
	N	176	177	174	177	177	177
A18	Pearson Correlation	.046	.422**	-.094	.094	.177*	1.000
	Sig. (2-tailed)	.540	.000	.214	.211	.019	.
	N	177	178	175	178	177	178

Correlations

		A13	A14	A15	A16	A17	A18
A19	Pearson Correlation	.074	.182*	.107	.218**	.251**	.126
	Sig. (2-tailed)	.330	.015	.160	.003	.001	.093
	N	177	178	175	178	177	178
A20	Pearson Correlation	.163*	.255**	.053	.268**	.264**	.118
	Sig. (2-tailed)	.030	.001	.482	.000	.000	.116
	N	177	178	175	178	177	178
A21	Pearson Correlation	.167*	.099	.124	.068	.134	.130
	Sig. (2-tailed)	.027	.191	.103	.366	.075	.085
	N	177	178	175	178	177	178
A22	Pearson Correlation	.144	.287**	.197**	.451**	.269**	.142
	Sig. (2-tailed)	.055	.000	.009	.000	.000	.058
	N	177	178	175	178	177	178
A23	Pearson Correlation	.016	.183*	.014	.282**	.139	.298**
	Sig. (2-tailed)	.832	.015	.854	.000	.065	.000
	N	177	178	175	178	177	178
A24	Pearson Correlation	-.093	.089	-.030	.079	.136	.076
	Sig. (2-tailed)	.224	.242	.693	.299	.074	.321
	N	172	173	171	173	172	173
A25	Pearson Correlation	.033	.156*	.210**	.440**	.304**	.033
	Sig. (2-tailed)	.666	.038	.005	.000	.000	.666
	N	176	177	174	177	176	177
A26	Pearson Correlation	.040	.206**	.180*	.491**	.515**	.143
	Sig. (2-tailed)	.599	.006	.017	.000	.000	.057
	N	177	178	175	178	177	178
A27	Pearson Correlation	.244**	.054	.053	.078	-.027	.021
	Sig. (2-tailed)	.001	.478	.488	.304	.721	.785
	N	175	176	174	176	175	176
A28	Pearson Correlation	-.014	.314**	.031	.206**	.418**	.103
	Sig. (2-tailed)	.852	.000	.683	.006	.000	.171
	N	177	178	175	178	177	178
A29	Pearson Correlation	-.065	.014	.226**	.202**	.347**	-.065
	Sig. (2-tailed)	.393	.856	.003	.007	.000	.385
	N	177	178	175	178	177	178
A30	Pearson Correlation	.102	.178*	.107	.267**	.261**	.154*
	Sig. (2-tailed)	.177	.018	.159	.000	.000	.041
	N	177	178	175	178	177	178
A31	Pearson Correlation	.009	.021	-.064	-.031	-.004	.118
	Sig. (2-tailed)	.907	.782	.402	.684	.956	.119
	N	176	177	175	177	176	177
A32	Pearson Correlation	.088	.276**	-.032	.009	.023	.266**
	Sig. (2-tailed)	.242	.000	.675	.906	.764	.000
	N	177	178	175	178	177	178
A33	Pearson Correlation	.171*	.260**	-.054	.106	.128	.405**
	Sig. (2-tailed)	.024	.000	.481	.162	.090	.000
	N	176	177	175	177	176	177
A34	Pearson Correlation	.156*	.313**	.087	.308**	.358**	.084
	Sig. (2-tailed)	.039	.000	.253	.000	.000	.264
	N	176	177	174	177	176	177
A35	Pearson Correlation	.852**	.171*	.070	.233**	.186*	.063
	Sig. (2-tailed)	.000	.023	.361	.002	.014	.402
	N	177	177	174	177	176	177
A36	Pearson Correlation	.133	.896**	-.019	.214**	.202**	.412**
	Sig. (2-tailed)	.079	.000	.806	.004	.007	.000
	N	177	178	175	178	177	178

Correlations

		A13	A14	A15	A16	A17	A18
A37	Pearson Correlation	.081	.072	.698**	.118	.079	-.022
	Sig. (2-tailed)	.287	.347	.000	.119	.299	.775
	N	174	175	175	175	174	175
A38	Pearson Correlation	.200**	.241**	.162*	.883**	.445**	.074
	Sig. (2-tailed)	.008	.001	.032	.000	.000	.326
	N	177	178	175	178	177	178
A39	Pearson Correlation	.093	.203**	.099	.409**	.829**	.144
	Sig. (2-tailed)	.218	.007	.195	.000	.000	.056
	N	176	177	174	177	177	177
A40	Pearson Correlation	.034	.417**	-.100	.071	.141	.865**
	Sig. (2-tailed)	.653	.000	.187	.348	.061	.000
	N	177	178	175	178	177	178
A41	Pearson Correlation	.069	.165*	.113	.184*	.167*	.109
	Sig. (2-tailed)	.358	.028	.136	.014	.026	.148
	N	177	178	175	178	177	178
A42	Pearson Correlation	.125	.200**	.018	.266**	.307**	.050
	Sig. (2-tailed)	.099	.008	.817	.000	.000	.507
	N	176	177	174	177	176	177
A43	Pearson Correlation	.230**	.194**	.058	.157*	.192*	.195**
	Sig. (2-tailed)	.002	.009	.445	.036	.011	.009
	N	177	178	175	178	177	178
A44	Pearson Correlation	.113	.367**	.221**	.478**	.299**	.193**
	Sig. (2-tailed)	.135	.000	.003	.000	.000	.010
	N	177	178	175	178	177	178

Correlations

		A19	A20	A21	A22	A23	A24
A1	Pearson Correlation	.103	.164*	.016	.194**	.714**	.210**
	Sig. (2-tailed)	.170	.029	.833	.010	.000	.006
	N	178	178	178	178	178	173
A2	Pearson Correlation	.113	.045	.062	.078	.100	.783**
	Sig. (2-tailed)	.139	.560	.421	.308	.192	.000
	N	173	173	173	173	173	173
A3	Pearson Correlation	.226**	.150*	.143	.449**	.138	.082
	Sig. (2-tailed)	.002	.046	.058	.000	.066	.282
	N	177	177	177	177	177	172
A4	Pearson Correlation	.238**	.079	.054	.441**	.241**	.159*
	Sig. (2-tailed)	.001	.293	.470	.000	.001	.037
	N	178	178	178	178	178	173
A5	Pearson Correlation	.007	-.041	-.024	.076	.184*	.112
	Sig. (2-tailed)	.928	.593	.748	.315	.014	.144
	N	176	176	176	176	176	171
A6	Pearson Correlation	.279**	.237**	.049	.300**	.155*	.124
	Sig. (2-tailed)	.000	.001	.514	.000	.038	.105
	N	178	178	178	178	178	173
A7	Pearson Correlation	.170*	.171*	.100	.186*	.016	.116
	Sig. (2-tailed)	.023	.022	.182	.013	.830	.128
	N	178	178	178	178	178	173
A8	Pearson Correlation	.071	.276**	.066	.335**	.194**	.102
	Sig. (2-tailed)	.349	.000	.384	.000	.010	.180
	N	178	178	178	178	178	173
A9	Pearson Correlation	.019	-.058	.093	-.091	-.038	.001
	Sig. (2-tailed)	.799	.443	.216	.228	.618	.985
	N	177	177	177	177	177	172
A10	Pearson Correlation	.122	.095	.159*	.175*	.174*	.016
	Sig. (2-tailed)	.104	.209	.034	.019	.021	.835
	N	178	178	178	178	178	173
A11	Pearson Correlation	.136	.171*	.179*	.178*	.133	.017
	Sig. (2-tailed)	.070	.023	.017	.018	.078	.821
	N	177	177	177	177	177	172
A12	Pearson Correlation	.261**	.167*	.198**	.455**	.110	.097
	Sig. (2-tailed)	.000	.025	.008	.000	.145	.204
	N	178	178	178	178	178	173
A13	Pearson Correlation	.074	.163*	.167*	.144	.016	-.093
	Sig. (2-tailed)	.330	.030	.027	.055	.832	.224
	N	177	177	177	177	177	172
A14	Pearson Correlation	.182*	.255**	.099	.287**	.183*	.089
	Sig. (2-tailed)	.015	.001	.191	.000	.015	.242
	N	178	178	178	178	178	173
A15	Pearson Correlation	.107	.053	.124	.197**	.014	-.030
	Sig. (2-tailed)	.160	.482	.103	.009	.854	.693
	N	175	175	175	175	175	171
A16	Pearson Correlation	.218**	.268**	.068	.451**	.282**	.079
	Sig. (2-tailed)	.003	.000	.366	.000	.000	.299
	N	178	178	178	178	178	173
A17	Pearson Correlation	.251**	.264**	.134	.269**	.139	.136
	Sig. (2-tailed)	.001	.000	.075	.000	.065	.074
	N	177	177	177	177	177	172
A18	Pearson Correlation	.126	.118	.130	.142	.298**	.076
	Sig. (2-tailed)	.093	.116	.085	.058	.000	.321
	N	178	178	178	178	178	173

Correlations

		A19	A20	A21	A22	A23	A24
A19	Pearson Correlation	1.000	.106	.012	.377**	.120	.167*
	Sig. (2-tailed)	.	.158	.874	.000	.112	.028
	N	178	178	178	178	178	173
A20	Pearson Correlation	.106	1.000	.110	.249**	.126	.018
	Sig. (2-tailed)	.158	.	.145	.001	.093	.811
	N	178	178	178	178	178	173
A21	Pearson Correlation	.012	.110	1.000	.165*	-.045	.075
	Sig. (2-tailed)	.874	.145	.	.028	.551	.326
	N	178	178	178	178	178	173
A22	Pearson Correlation	.377**	.249**	.165*	1.000	.222**	.125
	Sig. (2-tailed)	.000	.001	.028	.	.003	.100
	N	178	178	178	178	178	173
A23	Pearson Correlation	.120	.126	-.045	.222**	1.000	.168*
	Sig. (2-tailed)	.112	.093	.551	.003	.	.028
	N	178	178	178	178	178	173
A24	Pearson Correlation	.167*	.018	.075	.125	.168*	1.000
	Sig. (2-tailed)	.028	.811	.326	.100	.028	.
	N	173	173	173	173	173	173
A25	Pearson Correlation	.203**	.091	.140	.499**	.166*	.130
	Sig. (2-tailed)	.007	.229	.063	.000	.028	.090
	N	177	177	177	177	177	172
A26	Pearson Correlation	.253**	.126	.094	.436**	.226**	.203**
	Sig. (2-tailed)	.001	.093	.213	.000	.002	.007
	N	178	178	178	178	178	173
A27	Pearson Correlation	.015	-.046	-.021	.092	.215**	.149
	Sig. (2-tailed)	.840	.546	.786	.223	.004	.052
	N	176	176	176	176	176	171
A28	Pearson Correlation	.258**	.159*	.072	.214**	.118	.109
	Sig. (2-tailed)	.000	.035	.339	.004	.116	.154
	N	178	178	178	178	178	173
A29	Pearson Correlation	.137	.094	.060	.116	.028	-.047
	Sig. (2-tailed)	.069	.213	.429	.123	.714	.539
	N	178	178	178	178	178	173
A30	Pearson Correlation	.196**	.189*	.051	.274**	.287**	.164*
	Sig. (2-tailed)	.009	.012	.497	.000	.000	.031
	N	178	178	178	178	178	173
A31	Pearson Correlation	.141	.055	.057	-.047	.054	.082
	Sig. (2-tailed)	.061	.470	.452	.532	.478	.283
	N	177	177	177	177	177	172
A32	Pearson Correlation	.164*	.061	.172*	.170*	.095	.056
	Sig. (2-tailed)	.029	.418	.021	.023	.208	.463
	N	178	178	178	178	178	173
A33	Pearson Correlation	.138	.053	.139	.166*	.133	.047
	Sig. (2-tailed)	.067	.481	.065	.027	.078	.541
	N	177	177	177	177	177	172
A34	Pearson Correlation	.215**	.081	.171*	.382**	.049	.070
	Sig. (2-tailed)	.004	.281	.023	.000	.514	.360
	N	177	177	177	177	177	172
A35	Pearson Correlation	.144	.266**	.193*	.190*	.027	-.020
	Sig. (2-tailed)	.056	.000	.010	.011	.719	.797
	N	177	177	177	177	177	172
A36	Pearson Correlation	.121	.262**	.069	.258**	.132	.045
	Sig. (2-tailed)	.108	.000	.358	.001	.078	.554
	N	178	178	178	178	178	173

Correlations

		A19	A20	A21	A22	A23	A24
A37	Pearson Correlation	.099	.047	.091	.205**	.057	.040
	Sig. (2-tailed)	.194	.536	.231	.006	.456	.601
	N	175	175	175	175	175	171
A38	Pearson Correlation	.234**	.327**	.101	.407**	.186*	.072
	Sig. (2-tailed)	.002	.000	.180	.000	.013	.347
	N	178	178	178	178	178	173
A39	Pearson Correlation	.246**	.271**	.179*	.210**	.058	.158*
	Sig. (2-tailed)	.001	.000	.017	.005	.446	.038
	N	177	177	177	177	177	172
A40	Pearson Correlation	.067	.139	.137	.138	.206**	.096
	Sig. (2-tailed)	.373	.064	.068	.067	.006	.207
	N	178	178	178	178	178	173
A41	Pearson Correlation	.799**	-.034	-.020	.292**	.083	.159*
	Sig. (2-tailed)	.000	.649	.792	.000	.269	.037
	N	178	178	178	178	178	173
A42	Pearson Correlation	.198**	.673**	.094	.229**	.131	-.006
	Sig. (2-tailed)	.008	.000	.216	.002	.083	.936
	N	177	177	177	177	177	172
A43	Pearson Correlation	.050	.077	.837**	.243**	.039	.133
	Sig. (2-tailed)	.505	.307	.000	.001	.606	.082
	N	178	178	178	178	178	173
A44	Pearson Correlation	.387**	.209**	.182*	.901**	.269**	.195*
	Sig. (2-tailed)	.000	.005	.015	.000	.000	.010
	N	178	178	178	178	178	173

Correlations

		A25	A26	A27	A28	A29	A30
A1	Pearson Correlation	.164*	.186*	.186*	.138	.024	.300**
	Sig. (2-tailed)	.030	.013	.014	.066	.749	.000
	N	177	178	176	178	178	178
A2	Pearson Correlation	.059	.087	.013	.049	-.029	.089
	Sig. (2-tailed)	.439	.253	.863	.524	.708	.245
	N	172	173	171	173	173	173
A3	Pearson Correlation	.790**	.498**	-.001	.420**	.210**	.330**
	Sig. (2-tailed)	.000	.000	.988	.000	.005	.000
	N	177	177	175	177	177	177
A4	Pearson Correlation	.571**	.892**	.027	.471**	.306**	.413**
	Sig. (2-tailed)	.000	.000	.722	.000	.000	.000
	N	177	178	176	178	178	178
A5	Pearson Correlation	.021	.039	.889**	.010	-.025	.009
	Sig. (2-tailed)	.782	.609	.000	.895	.738	.911
	N	175	176	176	176	176	176
A6	Pearson Correlation	.356**	.561**	.042	.858**	.269**	.170*
	Sig. (2-tailed)	.000	.000	.578	.000	.000	.023
	N	177	178	176	178	178	178
A7	Pearson Correlation	.256**	.370**	.092	.329**	.746**	.149*
	Sig. (2-tailed)	.001	.000	.223	.000	.000	.047
	N	177	178	176	178	178	178
A8	Pearson Correlation	.272**	.315**	.087	.091	.181*	.606**
	Sig. (2-tailed)	.000	.000	.250	.227	.016	.000
	N	177	178	176	178	178	178
A9	Pearson Correlation	.009	-.011	.203**	-.015	-.015	.126
	Sig. (2-tailed)	.902	.883	.007	.841	.847	.094
	N	176	177	176	177	177	177
A10	Pearson Correlation	.029	.077	.014	.159*	.005	.198**
	Sig. (2-tailed)	.705	.307	.858	.034	.947	.008
	N	177	178	176	178	178	178
A11	Pearson Correlation	.088	.103	-.037	.057	.016	.163*
	Sig. (2-tailed)	.245	.174	.626	.451	.834	.030
	N	176	177	175	177	177	177
A12	Pearson Correlation	.355**	.433**	.038	.390**	.239**	.217**
	Sig. (2-tailed)	.000	.000	.617	.000	.001	.004
	N	177	178	176	178	178	178
A13	Pearson Correlation	.033	.040	.244**	-.014	-.065	.102
	Sig. (2-tailed)	.666	.599	.001	.852	.393	.177
	N	176	177	175	177	177	177
A14	Pearson Correlation	.156*	.206**	.054	.314**	.014	.178*
	Sig. (2-tailed)	.038	.006	.478	.000	.856	.018
	N	177	178	176	178	178	178
A15	Pearson Correlation	.210**	.180*	.053	.031	.226**	.107
	Sig. (2-tailed)	.005	.017	.488	.683	.003	.159
	N	174	175	174	175	175	175
A16	Pearson Correlation	.440**	.491**	.078	.206**	.202**	.267**
	Sig. (2-tailed)	.000	.000	.304	.006	.007	.000
	N	177	178	176	178	178	178
A17	Pearson Correlation	.304**	.515**	-.027	.418**	.347**	.261**
	Sig. (2-tailed)	.000	.000	.721	.000	.000	.000
	N	176	177	175	177	177	177
A18	Pearson Correlation	.033	.143	.021	.103	-.065	.154*
	Sig. (2-tailed)	.666	.057	.785	.171	.385	.041
	N	177	178	176	178	178	178

Correlations

		A25	A26	A27	A28	A29	A30
A19	Pearson Correlation	.203**	.253**	.015	.258**	.137	.196**
	Sig. (2-tailed)	.007	.001	.840	.000	.069	.009
	N	177	178	176	178	178	178
A20	Pearson Correlation	.091	.126	-.046	.159*	.094	.189*
	Sig. (2-tailed)	.229	.093	.546	.035	.213	.012
	N	177	178	176	178	178	178
A21	Pearson Correlation	.140	.094	-.021	.072	.060	.051
	Sig. (2-tailed)	.063	.213	.786	.339	.429	.497
	N	177	178	176	178	178	178
A22	Pearson Correlation	.499**	.436**	.092	.214**	.116	.274**
	Sig. (2-tailed)	.000	.000	.223	.004	.123	.000
	N	177	178	176	178	178	178
A23	Pearson Correlation	.166*	.226**	.215**	.118	.028	.287**
	Sig. (2-tailed)	.028	.002	.004	.116	.714	.000
	N	177	178	176	178	178	178
A24	Pearson Correlation	.130	.203**	.149	.109	-.047	.164*
	Sig. (2-tailed)	.090	.007	.052	.154	.539	.031
	N	172	173	171	173	173	173
A25	Pearson Correlation	1.000	.634**	.034	.310**	.222**	.314**
	Sig. (2-tailed)	.	.000	.652	.000	.003	.000
	N	177	177	175	177	177	177
A26	Pearson Correlation	.634**	1.000	.025	.483**	.323**	.405**
	Sig. (2-tailed)	.000	.	.740	.000	.000	.000
	N	177	178	176	178	178	178
A27	Pearson Correlation	.034	.025	1.000	.033	-.030	.030
	Sig. (2-tailed)	.652	.740	.	.662	.695	.693
	N	175	176	176	176	176	176
A28	Pearson Correlation	.310**	.483**	.033	1.000	.254**	.158*
	Sig. (2-tailed)	.000	.000	.662	.	.001	.035
	N	177	178	176	178	178	178
A29	Pearson Correlation	.222**	.323**	-.030	.254**	1.000	.318**
	Sig. (2-tailed)	.003	.000	.695	.001	.	.000
	N	177	178	176	178	178	178
A30	Pearson Correlation	.314**	.405**	.030	.158*	.318**	1.000
	Sig. (2-tailed)	.000	.000	.693	.035	.000	.
	N	177	178	176	178	178	178
A31	Pearson Correlation	.002	.033	.190*	.001	.075	.366**
	Sig. (2-tailed)	.980	.668	.011	.992	.318	.000
	N	176	177	176	177	177	177
A32	Pearson Correlation	-.008	.028	.077	.167*	-.011	.146
	Sig. (2-tailed)	.912	.714	.307	.026	.886	.051
	N	177	178	176	178	178	178
A33	Pearson Correlation	.129	.093	.083	.102	-.039	.095
	Sig. (2-tailed)	.088	.218	.278	.175	.610	.210
	N	176	177	175	177	177	177
A34	Pearson Correlation	.269**	.339**	.033	.309**	.177*	.142
	Sig. (2-tailed)	.000	.000	.665	.000	.018	.059
	N	176	177	175	177	177	177
A35	Pearson Correlation	.038	.117	.230**	.060	-.024	.091
	Sig. (2-tailed)	.617	.121	.002	.429	.754	.226
	N	176	177	175	177	177	177
A36	Pearson Correlation	.103	.107	.056	.277**	-.037	.029
	Sig. (2-tailed)	.174	.156	.459	.000	.625	.700
	N	177	178	176	178	178	178

Correlations

		A25	A26	A27	A28	A29	A30
A37	Pearson Correlation	.144	.095	.204**	.051	-.001	-.103
	Sig. (2-tailed)	.059	.212	.007	.506	.986	.175
	N	174	175	174	175	175	175
A38	Pearson Correlation	.370**	.438**	.032	.236**	.189*	.177*
	Sig. (2-tailed)	.000	.000	.672	.002	.012	.018
	N	177	178	176	178	178	178
A39	Pearson Correlation	.277**	.435**	-.052	.322**	.305**	.306**
	Sig. (2-tailed)	.000	.000	.495	.000	.000	.000
	N	176	177	175	177	177	177
A40	Pearson Correlation	-.049	.046	-.010	.093	-.143	.012
	Sig. (2-tailed)	.516	.542	.898	.219	.056	.869
	N	177	178	176	178	178	178
A41	Pearson Correlation	.217**	.217**	.069	.224**	.025	.020
	Sig. (2-tailed)	.004	.004	.365	.003	.740	.789
	N	177	178	176	178	178	178
A42	Pearson Correlation	.171*	.186*	-.102	.183*	.287**	.399**
	Sig. (2-tailed)	.023	.013	.180	.015	.000	.000
	N	176	177	175	177	177	177
A43	Pearson Correlation	.193*	.153*	.068	.076	.066	.086
	Sig. (2-tailed)	.010	.042	.367	.310	.379	.251
	N	177	178	176	178	178	178
A44	Pearson Correlation	.536**	.534**	.093	.288**	.174*	.417**
	Sig. (2-tailed)	.000	.000	.221	.000	.020	.000
	N	177	178	176	178	178	178

Correlations

		A31	A32	A33	A34	A35	A36
A1	Pearson Correlation	.017	.170*	.051	.063	.028	.109
	Sig. (2-tailed)	.823	.023	.497	.405	.709	.147
	N	177	178	177	177	177	178
A2	Pearson Correlation	.007	.007	-.092	-.004	-.064	-.040
	Sig. (2-tailed)	.926	.925	.231	.961	.407	.600
	N	172	173	172	172	172	173
A3	Pearson Correlation	-.046	.051	.073	.205**	.078	.112
	Sig. (2-tailed)	.541	.497	.337	.006	.301	.138
	N	176	177	176	176	176	177
A4	Pearson Correlation	.024	-.002	.103	.384**	.083	.075
	Sig. (2-tailed)	.751	.983	.173	.000	.273	.320
	N	177	178	177	177	177	178
A5	Pearson Correlation	.164*	.055	.011	-.003	.239**	.051
	Sig. (2-tailed)	.029	.471	.884	.966	.001	.503
	N	176	176	175	175	175	176
A6	Pearson Correlation	.019	.145	.062	.342**	.063	.288**
	Sig. (2-tailed)	.803	.054	.416	.000	.408	.000
	N	177	178	177	177	177	178
A7	Pearson Correlation	.020	.020	.069	.227**	.065	.086
	Sig. (2-tailed)	.796	.791	.360	.002	.387	.252
	N	177	178	177	177	177	178
A8	Pearson Correlation	.216**	.066	.065	.071	.068	.060
	Sig. (2-tailed)	.004	.380	.392	.345	.366	.428
	N	177	178	177	177	177	178
A9	Pearson Correlation	.694**	.092	.101	-.068	.053	-.028
	Sig. (2-tailed)	.000	.221	.182	.372	.486	.709
	N	177	177	176	176	176	177
A10	Pearson Correlation	.168*	.764**	.063	-.035	.085	.226**
	Sig. (2-tailed)	.025	.000	.403	.642	.263	.002
	N	177	178	177	177	177	178
A11	Pearson Correlation	.207**	.143	.815**	.042	.194**	.187*
	Sig. (2-tailed)	.006	.057	.000	.582	.010	.013
	N	176	177	177	176	176	177
A12	Pearson Correlation	-.013	.008	.021	.851**	.104	.228**
	Sig. (2-tailed)	.860	.916	.782	.000	.166	.002
	N	177	178	177	177	177	178
A13	Pearson Correlation	.009	.088	.171*	.156*	.852**	.133
	Sig. (2-tailed)	.907	.242	.024	.039	.000	.079
	N	176	177	176	176	177	177
A14	Pearson Correlation	.021	.276**	.260**	.313**	.171*	.896**
	Sig. (2-tailed)	.782	.000	.000	.000	.023	.000
	N	177	178	177	177	177	178
A15	Pearson Correlation	-.064	-.032	-.054	.087	.070	-.019
	Sig. (2-tailed)	.402	.675	.481	.253	.361	.806
	N	175	175	175	174	174	175
A16	Pearson Correlation	-.031	.009	.106	.308**	.233**	.214**
	Sig. (2-tailed)	.684	.906	.162	.000	.002	.004
	N	177	178	177	177	177	178
A17	Pearson Correlation	-.004	.023	.128	.358**	.186*	.202**
	Sig. (2-tailed)	.956	.764	.090	.000	.014	.007
	N	176	177	176	176	176	177
A18	Pearson Correlation	.118	.266**	.405**	.084	.063	.412**
	Sig. (2-tailed)	.119	.000	.000	.264	.402	.000
	N	177	178	177	177	177	178

Correlations

		A31	A32	A33	A34	A35	A36
A19	Pearson Correlation	.141	.164*	.138	.215**	.144	.121
	Sig. (2-tailed)	.061	.029	.067	.004	.056	.108
	N	177	178	177	177	177	178
A20	Pearson Correlation	.055	.061	.053	.081	.266**	.262**
	Sig. (2-tailed)	.470	.418	.481	.281	.000	.000
	N	177	178	177	177	177	178
A21	Pearson Correlation	.057	.172*	.139	.171*	.193*	.069
	Sig. (2-tailed)	.452	.021	.065	.023	.010	.358
	N	177	178	177	177	177	178
A22	Pearson Correlation	-.047	.170*	.166*	.382**	.190*	.258**
	Sig. (2-tailed)	.532	.023	.027	.000	.011	.001
	N	177	178	177	177	177	178
A23	Pearson Correlation	.054	.095	.133	.049	.027	.132
	Sig. (2-tailed)	.478	.208	.078	.514	.719	.078
	N	177	178	177	177	177	178
A24	Pearson Correlation	.082	.056	.047	.070	-.020	.045
	Sig. (2-tailed)	.283	.463	.541	.360	.797	.554
	N	172	173	172	172	172	173
A25	Pearson Correlation	.002	-.008	.129	.269**	.038	.103
	Sig. (2-tailed)	.980	.912	.088	.000	.617	.174
	N	176	177	176	176	176	177
A26	Pearson Correlation	.033	.028	.093	.339**	.117	.107
	Sig. (2-tailed)	.668	.714	.218	.000	.121	.156
	N	177	178	177	177	177	178
A27	Pearson Correlation	.190*	.077	.083	.033	.230**	.056
	Sig. (2-tailed)	.011	.307	.278	.665	.002	.459
	N	176	176	175	175	175	176
A28	Pearson Correlation	.001	.167*	.102	.309**	.060	.277**
	Sig. (2-tailed)	.992	.026	.175	.000	.429	.000
	N	177	178	177	177	177	178
A29	Pearson Correlation	.075	-.011	-.039	.177*	-.024	-.037
	Sig. (2-tailed)	.318	.886	.610	.018	.754	.625
	N	177	178	177	177	177	178
A30	Pearson Correlation	.366**	.146	.095	.142	.091	.029
	Sig. (2-tailed)	.000	.051	.210	.059	.226	.700
	N	177	178	177	177	177	178
A31	Pearson Correlation	1.000	.136	.109	-.064	.097	-.034
	Sig. (2-tailed)	.	.071	.151	.401	.200	.655
	N	177	177	176	176	176	177
A32	Pearson Correlation	.136	1.000	.173*	.012	.155*	.285**
	Sig. (2-tailed)	.071	.	.022	.870	.039	.000
	N	177	178	177	177	177	178
A33	Pearson Correlation	.109	.173*	1.000	.091	.169*	.250**
	Sig. (2-tailed)	.151	.022	.	.229	.025	.001
	N	176	177	177	176	176	177
A34	Pearson Correlation	-.064	.012	.091	1.000	.114	.229**
	Sig. (2-tailed)	.401	.870	.229	.	.132	.002
	N	176	177	176	177	176	177
A35	Pearson Correlation	.097	.155*	.169*	.114	1.000	.173*
	Sig. (2-tailed)	.200	.039	.025	.132	.	.021
	N	176	177	176	176	177	177
A36	Pearson Correlation	-.034	.285**	.250**	.229**	.173*	1.000
	Sig. (2-tailed)	.655	.000	.001	.002	.021	.
	N	177	178	177	177	177	178

Correlations

		A31	A32	A33	A34	A35	A36
A37	Pearson Correlation	-.148	-.011	.116	.088	.092	.122
	Sig. (2-tailed)	.051	.884	.127	.246	.228	.106
	N	175	175	175	174	174	175
A38	Pearson Correlation	-.036	.067	.096	.292**	.313**	.227**
	Sig. (2-tailed)	.637	.373	.204	.000	.000	.002
	N	177	178	177	177	177	178
A39	Pearson Correlation	.032	.063	.092	.405**	.229**	.157*
	Sig. (2-tailed)	.676	.402	.223	.000	.002	.037
	N	176	177	176	176	176	177
A40	Pearson Correlation	.053	.270**	.418**	.078	.118	.465**
	Sig. (2-tailed)	.481	.000	.000	.303	.118	.000
	N	177	178	177	177	177	178
A41	Pearson Correlation	-.031	.128	.214**	.210**	.084	.174*
	Sig. (2-tailed)	.678	.090	.004	.005	.264	.020
	N	177	178	177	177	177	178
A42	Pearson Correlation	.172*	.060	.057	.104	.176*	.122
	Sig. (2-tailed)	.023	.426	.450	.167	.020	.105
	N	176	177	176	177	176	177
A43	Pearson Correlation	.044	.190*	.281**	.265**	.217**	.139
	Sig. (2-tailed)	.564	.011	.000	.000	.004	.064
	N	177	178	177	177	177	178
A44	Pearson Correlation	.018	.208**	.184*	.410**	.208**	.260**
	Sig. (2-tailed)	.808	.005	.014	.000	.006	.000
	N	177	178	177	177	177	178

Correlations

		A37	A38	A39	A40	A41	A42
A1	Pearson Correlation	-.031	.190*	.149*	.159*	.007	.164*
	Sig. (2-tailed)	.689	.011	.047	.034	.924	.029
	N	175	178	177	178	178	177
A2	Pearson Correlation	-.110	.035	.064	.017	.030	.084
	Sig. (2-tailed)	.152	.651	.404	.823	.695	.276
	N	171	173	172	173	173	172
A3	Pearson Correlation	.121	.333**	.250**	-.051	.137	.152*
	Sig. (2-tailed)	.112	.000	.001	.502	.069	.044
	N	174	177	176	177	177	176
A4	Pearson Correlation	.049	.355**	.372**	-.007	.172*	.189*
	Sig. (2-tailed)	.520	.000	.000	.925	.022	.012
	N	175	178	177	178	178	177
A5	Pearson Correlation	.169*	.068	-.055	.003	.035	-.024
	Sig. (2-tailed)	.025	.370	.471	.973	.643	.757
	N	174	176	175	176	176	175
A6	Pearson Correlation	.054	.253**	.364**	.107	.256**	.197**
	Sig. (2-tailed)	.475	.001	.000	.155	.001	.009
	N	175	178	177	178	178	177
A7	Pearson Correlation	.245**	.240**	.288**	-.037	.168*	.110
	Sig. (2-tailed)	.001	.001	.000	.622	.025	.146
	N	175	178	177	178	178	177
A8	Pearson Correlation	.050	.184*	.157*	.032	.035	.266**
	Sig. (2-tailed)	.514	.014	.037	.672	.639	.000
	N	175	178	177	178	178	177
A9	Pearson Correlation	-.117	-.060	-.082	.037	-.023	.083
	Sig. (2-tailed)	.122	.428	.281	.626	.757	.274
	N	175	177	176	177	177	176
A10	Pearson Correlation	-.048	.060	.019	.207**	.059	.085
	Sig. (2-tailed)	.530	.426	.803	.005	.431	.260
	N	175	178	177	178	178	177
A11	Pearson Correlation	-.020	.148*	.157*	.408**	.080	.088
	Sig. (2-tailed)	.789	.050	.038	.000	.289	.246
	N	175	177	176	177	177	176
A12	Pearson Correlation	.096	.300**	.416**	.083	.143	.260**
	Sig. (2-tailed)	.206	.000	.000	.269	.057	.000
	N	175	178	177	178	178	177
A13	Pearson Correlation	.081	.200**	.093	.034	.069	.125
	Sig. (2-tailed)	.287	.008	.218	.653	.358	.099
	N	174	177	176	177	177	176
A14	Pearson Correlation	.072	.241**	.203**	.417**	.165*	.200**
	Sig. (2-tailed)	.347	.001	.007	.000	.028	.008
	N	175	178	177	178	178	177
A15	Pearson Correlation	.698**	.162*	.099	-.100	.113	.018
	Sig. (2-tailed)	.000	.032	.195	.187	.136	.817
	N	175	175	174	175	175	174
A16	Pearson Correlation	.118	.883**	.409**	.071	.184*	.266**
	Sig. (2-tailed)	.119	.000	.000	.348	.014	.000
	N	175	178	177	178	178	177
A17	Pearson Correlation	.079	.445**	.829**	.141	.167*	.307**
	Sig. (2-tailed)	.299	.000	.000	.061	.026	.000
	N	174	177	177	177	177	176
A18	Pearson Correlation	-.022	.074	.144	.865**	.109	.050
	Sig. (2-tailed)	.775	.326	.056	.000	.148	.507
	N	175	178	177	178	178	177

Correlations

		A37	A38	A39	A40	A41	A42
A19	Pearson Correlation	.099	.234**	.246**	.067	.799**	.198**
	Sig. (2-tailed)	.194	.002	.001	.373	.000	.008
	N	175	178	177	178	178	177
A20	Pearson Correlation	.047	.327**	.271**	.139	-.034	.673**
	Sig. (2-tailed)	.536	.000	.000	.064	.649	.000
	N	175	178	177	178	178	177
A21	Pearson Correlation	.091	.101	.179*	.137	-.020	.094
	Sig. (2-tailed)	.231	.180	.017	.068	.792	.216
	N	175	178	177	178	178	177
A22	Pearson Correlation	.205**	.407**	.210**	.138	.292**	.229**
	Sig. (2-tailed)	.006	.000	.005	.067	.000	.002
	N	175	178	177	178	178	177
A23	Pearson Correlation	.057	.186*	.058	.206**	.083	.131
	Sig. (2-tailed)	.456	.013	.446	.006	.269	.083
	N	175	178	177	178	178	177
A24	Pearson Correlation	.040	.072	.158*	.096	.159*	-.006
	Sig. (2-tailed)	.601	.347	.038	.207	.037	.936
	N	171	173	172	173	173	172
A25	Pearson Correlation	.144	.370**	.277**	-.049	.217**	.171*
	Sig. (2-tailed)	.059	.000	.000	.516	.004	.023
	N	174	177	176	177	177	176
A26	Pearson Correlation	.095	.438**	.435**	.046	.217**	.186*
	Sig. (2-tailed)	.212	.000	.000	.542	.004	.013
	N	175	178	177	178	178	177
A27	Pearson Correlation	.204**	.032	-.052	-.010	.069	-.102
	Sig. (2-tailed)	.007	.672	.495	.898	.365	.180
	N	174	176	175	176	176	175
A28	Pearson Correlation	.051	.236**	.322**	.093	.224**	.183*
	Sig. (2-tailed)	.506	.002	.000	.219	.003	.015
	N	175	178	177	178	178	177
A29	Pearson Correlation	-.001	.189*	.305**	-.143	.025	.287**
	Sig. (2-tailed)	.986	.012	.000	.056	.740	.000
	N	175	178	177	178	178	177
A30	Pearson Correlation	-.103	.177*	.306**	.012	.020	.399**
	Sig. (2-tailed)	.175	.018	.000	.869	.789	.000
	N	175	178	177	178	178	177
A31	Pearson Correlation	-.148	-.036	.032	.053	-.031	.172*
	Sig. (2-tailed)	.051	.637	.676	.481	.678	.023
	N	175	177	176	177	177	176
A32	Pearson Correlation	-.011	.067	.063	.270**	.128	.060
	Sig. (2-tailed)	.884	.373	.402	.000	.090	.426
	N	175	178	177	178	178	177
A33	Pearson Correlation	.116	.096	.092	.418**	.214**	.057
	Sig. (2-tailed)	.127	.204	.223	.000	.004	.450
	N	175	177	176	177	177	176
A34	Pearson Correlation	.088	.292**	.405**	.078	.210**	.104
	Sig. (2-tailed)	.246	.000	.000	.303	.005	.167
	N	174	177	176	177	177	177
A35	Pearson Correlation	.092	.313**	.229**	.118	.084	.176*
	Sig. (2-tailed)	.228	.000	.002	.118	.264	.020
	N	174	177	176	177	177	176
A36	Pearson Correlation	.122	.227**	.157*	.465**	.174*	.122
	Sig. (2-tailed)	.106	.002	.037	.000	.020	.105
	N	175	178	177	178	178	177

Correlations

		A37	A38	A39	A40	A41	A42
A37	Pearson Correlation	1.000	.113	-.007	.036	.259**	-.171*
	Sig. (2-tailed)	.	.135	.928	.635	.001	.024
	N	175	175	174	175	175	174
A38	Pearson Correlation	.113	1.000	.475**	.114	.172*	.256**
	Sig. (2-tailed)	.135	.	.000	.131	.022	.001
	N	175	178	177	178	178	177
A39	Pearson Correlation	-.007	.475**	1.000	.138	.117	.274**
	Sig. (2-tailed)	.928	.000	.	.066	.121	.000
	N	174	177	177	177	177	176
A40	Pearson Correlation	.036	.114	.138	1.000	.116	.053
	Sig. (2-tailed)	.635	.131	.066	.	.125	.486
	N	175	178	177	178	178	177
A41	Pearson Correlation	.259**	.172*	.117	.116	1.000	-.100
	Sig. (2-tailed)	.001	.022	.121	.125	.	.186
	N	175	178	177	178	178	177
A42	Pearson Correlation	-.171*	.256**	.274**	.053	-.100	1.000
	Sig. (2-tailed)	.024	.001	.000	.486	.186	.
	N	174	177	176	177	177	177
A43	Pearson Correlation	.228**	.093	.137	.182*	.121	.055
	Sig. (2-tailed)	.002	.215	.069	.015	.107	.466
	N	175	178	177	178	178	177
A44	Pearson Correlation	.176*	.419**	.298**	.143	.328**	.219**
	Sig. (2-tailed)	.020	.000	.000	.057	.000	.003
	N	175	178	177	178	178	177

Correlations

		A43	A44
A1	Pearson Correlation	-.030	.244**
	Sig. (2-tailed)	.686	.001
	N	178	178
A2	Pearson Correlation	-.011	.046
	Sig. (2-tailed)	.889	.548
	N	173	173
A3	Pearson Correlation	.111	.517**
	Sig. (2-tailed)	.142	.000
	N	177	177
A4	Pearson Correlation	.143	.525**
	Sig. (2-tailed)	.058	.000
	N	178	178
A5	Pearson Correlation	.024	.058
	Sig. (2-tailed)	.749	.443
	N	176	176
A6	Pearson Correlation	.125	.309**
	Sig. (2-tailed)	.098	.000
	N	178	178
A7	Pearson Correlation	.202**	.206**
	Sig. (2-tailed)	.007	.006
	N	178	178
A8	Pearson Correlation	.066	.281**
	Sig. (2-tailed)	.382	.000
	N	178	178
A9	Pearson Correlation	.058	-.089
	Sig. (2-tailed)	.446	.238
	N	177	177
A10	Pearson Correlation	.145	.195**
	Sig. (2-tailed)	.053	.009
	N	178	178
A11	Pearson Correlation	.142	.200**
	Sig. (2-tailed)	.059	.008
	N	177	177
A12	Pearson Correlation	.218**	.460**
	Sig. (2-tailed)	.003	.000
	N	178	178
A13	Pearson Correlation	.230**	.113
	Sig. (2-tailed)	.002	.135
	N	177	177
A14	Pearson Correlation	.194**	.367**
	Sig. (2-tailed)	.009	.000
	N	178	178
A15	Pearson Correlation	.058	.221**
	Sig. (2-tailed)	.445	.003
	N	175	175
A16	Pearson Correlation	.157*	.478**
	Sig. (2-tailed)	.036	.000
	N	178	178
A17	Pearson Correlation	.192*	.299**
	Sig. (2-tailed)	.011	.000
	N	177	177
A18	Pearson Correlation	.195**	.193**
	Sig. (2-tailed)	.009	.010
	N	178	178

Correlations

		A43	A44
A19	Pearson Correlation	.050	.387**
	Sig. (2-tailed)	.505	.000
	N	178	178
A20	Pearson Correlation	.077	.209**
	Sig. (2-tailed)	.307	.005
	N	178	178
A21	Pearson Correlation	.837**	.182*
	Sig. (2-tailed)	.000	.015
	N	178	178
A22	Pearson Correlation	.243**	.901**
	Sig. (2-tailed)	.001	.000
	N	178	178
A23	Pearson Correlation	.039	.269**
	Sig. (2-tailed)	.606	.000
	N	178	178
A24	Pearson Correlation	.133	.195*
	Sig. (2-tailed)	.082	.010
	N	173	173
A25	Pearson Correlation	.193*	.536**
	Sig. (2-tailed)	.010	.000
	N	177	177
A26	Pearson Correlation	.153*	.534**
	Sig. (2-tailed)	.042	.000
	N	178	178
A27	Pearson Correlation	.068	.093
	Sig. (2-tailed)	.367	.221
	N	176	176
A28	Pearson Correlation	.076	.288**
	Sig. (2-tailed)	.310	.000
	N	178	178
A29	Pearson Correlation	.066	.174*
	Sig. (2-tailed)	.379	.020
	N	178	178
A30	Pearson Correlation	.086	.417**
	Sig. (2-tailed)	.251	.000
	N	178	178
A31	Pearson Correlation	.044	.018
	Sig. (2-tailed)	.564	.808
	N	177	177
A32	Pearson Correlation	.190*	.208**
	Sig. (2-tailed)	.011	.005
	N	178	178
A33	Pearson Correlation	.281**	.184*
	Sig. (2-tailed)	.000	.014
	N	177	177
A34	Pearson Correlation	.265**	.410**
	Sig. (2-tailed)	.000	.000
	N	177	177
A35	Pearson Correlation	.217**	.208**
	Sig. (2-tailed)	.004	.006
	N	177	177
A36	Pearson Correlation	.139	.260**
	Sig. (2-tailed)	.064	.000
	N	178	178

Correlations

		A43	A44
A37	Pearson Correlation	.228**	.176*
	Sig. (2-tailed)	.002	.020
	N	175	175
A38	Pearson Correlation	.093	.419**
	Sig. (2-tailed)	.215	.000
	N	178	178
A39	Pearson Correlation	.137	.298**
	Sig. (2-tailed)	.069	.000
	N	177	177
A40	Pearson Correlation	.182*	.143
	Sig. (2-tailed)	.015	.057
	N	178	178
A41	Pearson Correlation	.121	.328**
	Sig. (2-tailed)	.107	.000
	N	178	178
A42	Pearson Correlation	.055	.219**
	Sig. (2-tailed)	.466	.003
	N	177	177
A43	Pearson Correlation	1.000	.264**
	Sig. (2-tailed)	.	.000
	N	178	178
A44	Pearson Correlation	.264**	1.000
	Sig. (2-tailed)	.000	.
	N	178	178

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Inter-item Correlations for SEQ Happen scores at week2

Correlations

		B1	B2	B3	B4	B5	B6
B1	Pearson Correlation	1.000	.165*	.117	.118	.069	-.060
	Sig. (2-tailed)	.	.031	.123	.120	.365	.427
	N	177	172	176	176	174	177
B2	Pearson Correlation	.165*	1.000	.113	.133	.069	-.041
	Sig. (2-tailed)	.031	.	.141	.084	.369	.591
	N	172	172	171	171	170	172
B3	Pearson Correlation	.117	.113	1.000	.591**	.070	.372**
	Sig. (2-tailed)	.123	.141	.	.000	.357	.000
	N	176	171	176	175	173	176
B4	Pearson Correlation	.118	.133	.591**	1.000	.067	.524**
	Sig. (2-tailed)	.120	.084	.000	.	.378	.000
	N	176	171	175	176	173	176
B5	Pearson Correlation	.069	.069	.070	.067	1.000	.068
	Sig. (2-tailed)	.365	.369	.357	.378	.	.371
	N	174	170	173	173	174	174
B6	Pearson Correlation	-.060	-.041	.372**	.524**	.068	1.000
	Sig. (2-tailed)	.427	.591	.000	.000	.371	.
	N	177	172	176	176	174	177
B7	Pearson Correlation	-.025	.148	.273**	.287**	.097	.200**
	Sig. (2-tailed)	.737	.052	.000	.000	.204	.008
	N	177	172	176	176	174	177
B8	Pearson Correlation	.148	-.058	.276**	.287**	.047	.176*
	Sig. (2-tailed)	.050	.455	.000	.000	.539	.020
	N	175	170	174	174	172	175
B9	Pearson Correlation	.021	-.003	.005	-.065	.273**	-.037
	Sig. (2-tailed)	.784	.971	.944	.396	.000	.628
	N	175	170	174	174	173	175
B10	Pearson Correlation	.178*	.076	.019	.094	.155*	.058
	Sig. (2-tailed)	.018	.321	.804	.213	.042	.443
	N	177	172	176	176	174	177
B11	Pearson Correlation	.043	-.011	.005	-.006	.083	.111
	Sig. (2-tailed)	.573	.884	.950	.934	.275	.141
	N	177	172	176	176	174	177
B12	Pearson Correlation	.066	.138	.404**	.519**	.058	.365**
	Sig. (2-tailed)	.380	.072	.000	.000	.448	.000
	N	177	172	176	176	174	177
B13	Pearson Correlation	.139	.127	.264**	.367**	.106	.298**
	Sig. (2-tailed)	.066	.097	.000	.000	.166	.000
	N	176	171	175	175	173	176
B14	Pearson Correlation	.165*	.062	.247**	.253**	.104	.160*
	Sig. (2-tailed)	.028	.421	.001	.001	.172	.033
	N	177	172	176	176	174	177
B15	Pearson Correlation	.095	-.039	.052	-.034	.133	-.081
	Sig. (2-tailed)	.210	.609	.491	.657	.081	.283
	N	176	171	175	175	174	176
B16	Pearson Correlation	.019	.193*	.255**	.324**	-.045	.303**
	Sig. (2-tailed)	.798	.011	.001	.000	.558	.000
	N	177	172	176	176	174	177
B17	Pearson Correlation	.074	.075	.388**	.418**	.086	.308**
	Sig. (2-tailed)	.326	.329	.000	.000	.262	.000
	N	177	172	176	176	174	177
B18	Pearson Correlation	.124	.103	.004	.121	-.024	.046
	Sig. (2-tailed)	.101	.180	.956	.110	.749	.548
	N	176	171	175	175	173	176

Correlations

		B1	B2	B3	B4	B5	B6
B19	Pearson Correlation	.191*	.014	-.095	-.052	.050	.002
	Sig. (2-tailed)	.011	.856	.209	.495	.513	.979
	N	177	172	176	176	174	177
B20	Pearson Correlation	.139	.096	.234**	.209**	.062	.155*
	Sig. (2-tailed)	.065	.208	.002	.005	.419	.039
	N	177	172	176	176	174	177
B21	Pearson Correlation	.114	.000	.161*	.109	.086	.231**
	Sig. (2-tailed)	.131	.996	.033	.149	.259	.002
	N	177	172	176	176	174	177
B22	Pearson Correlation	.067	.223**	.268**	.270**	.262**	.297**
	Sig. (2-tailed)	.372	.003	.000	.000	.000	.000
	N	177	172	176	176	174	177
B23	Pearson Correlation	.019	.094	.018	.077	.222**	.162*
	Sig. (2-tailed)	.804	.218	.817	.310	.003	.032
	N	177	172	176	176	174	177
B24	Pearson Correlation	.112	.154*	.243**	.271**	.022	.133
	Sig. (2-tailed)	.137	.043	.001	.000	.768	.079
	N	177	172	176	176	174	177
B25	Pearson Correlation	.095	.243**	.176*	.251**	.170*	.151*
	Sig. (2-tailed)	.212	.001	.020	.001	.025	.045
	N	176	171	175	175	173	176
B26	Pearson Correlation	.102	.281**	.148	.228**	.212**	.216**
	Sig. (2-tailed)	.178	.000	.050	.002	.005	.004
	N	177	172	176	176	174	177
B27	Pearson Correlation	.064	.242**	.268**	.265**	.188*	.157*
	Sig. (2-tailed)	.401	.001	.000	.000	.013	.037
	N	177	172	176	176	174	177
B28	Pearson Correlation	.048	.112	.222**	.257**	.101	.247**
	Sig. (2-tailed)	.526	.146	.003	.001	.188	.001
	N	176	171	175	175	173	176
B29	Pearson Correlation	-.131	.008	.020	-.047	.023	.021
	Sig. (2-tailed)	.082	.913	.789	.534	.765	.786
	N	177	172	176	176	174	177
B30	Pearson Correlation	.142	.045	.183*	.340**	.123	.331**
	Sig. (2-tailed)	.059	.558	.016	.000	.108	.000
	N	176	171	175	175	173	176
B31	Pearson Correlation	.046	-.041	.155*	.145	.140	.056
	Sig. (2-tailed)	.549	.593	.042	.056	.066	.460
	N	175	170	174	174	172	175
B32	Pearson Correlation	.027	.039	.068	.026	.024	.020
	Sig. (2-tailed)	.716	.616	.370	.728	.751	.788
	N	177	172	176	176	174	177
B33	Pearson Correlation	-.079	.077	.249**	.140	-.010	.180*
	Sig. (2-tailed)	.297	.317	.001	.064	.893	.017
	N	177	172	176	176	174	177
B34	Pearson Correlation	.024	.073	.277**	.240**	-.011	.308**
	Sig. (2-tailed)	.755	.344	.000	.001	.886	.000
	N	176	171	175	175	173	176
B35	Pearson Correlation	.119	.103	.403**	.307**	.129	.264**
	Sig. (2-tailed)	.115	.180	.000	.000	.091	.000
	N	176	171	175	175	173	176
B36	Pearson Correlation	.095	.214**	.319**	.298**	.131	.282**
	Sig. (2-tailed)	.208	.005	.000	.000	.085	.000
	N	177	172	176	176	174	177

Correlations

		B1	B2	B3	B4	B5	B6
B37	Pearson Correlation	.160*	.250**	.266**	.210**	-.035	.159*
	Sig. (2-tailed)	.034	.001	.000	.005	.644	.034
	N	177	172	176	176	174	177
B38	Pearson Correlation	.125	.092	.104	.124	.033	.189*
	Sig. (2-tailed)	.098	.228	.168	.101	.668	.012
	N	177	172	176	176	174	177
B39	Pearson Correlation	.182*	.108	.184*	.204**	.213**	.153*
	Sig. (2-tailed)	.015	.160	.014	.007	.005	.042
	N	177	172	176	176	174	177
B40	Pearson Correlation	.116	.158*	.152*	.248**	-.041	.184*
	Sig. (2-tailed)	.123	.039	.044	.001	.594	.014
	N	177	172	176	176	174	177
B41	Pearson Correlation	.066	.083	.185*	.266**	.017	.278**
	Sig. (2-tailed)	.387	.283	.015	.000	.825	.000
	N	175	171	174	174	173	175
B42	Pearson Correlation	-.013	.107	.097	.100	.273**	.114
	Sig. (2-tailed)	.864	.165	.204	.190	.000	.135
	N	174	170	173	173	171	174
B43	Pearson Correlation	.157*	.081	.174*	.189*	.087	.219**
	Sig. (2-tailed)	.038	.292	.021	.012	.255	.003
	N	177	172	176	176	174	177
B44	Pearson Correlation	.170*	.067	.268**	.269**	-.024	.300**
	Sig. (2-tailed)	.024	.382	.000	.000	.750	.000
	N	177	172	176	176	174	177

Correlations

		B7	B8	B9	B10	B11	B12
B1	Pearson Correlation	-.025	.148	.021	.178*	.043	.066
	Sig. (2-tailed)	.737	.050	.784	.018	.573	.380
	N	177	175	175	177	177	177
B2	Pearson Correlation	.148	-.058	-.003	.076	-.011	.138
	Sig. (2-tailed)	.052	.455	.971	.321	.884	.072
	N	172	170	170	172	172	172
B3	Pearson Correlation	.273**	.276**	.005	.019	.005	.404**
	Sig. (2-tailed)	.000	.000	.944	.804	.950	.000
	N	176	174	174	176	176	176
B4	Pearson Correlation	.287**	.287**	-.065	.094	-.006	.519**
	Sig. (2-tailed)	.000	.000	.396	.213	.934	.000
	N	176	174	174	176	176	176
B5	Pearson Correlation	.097	.047	.273**	.155*	.083	.058
	Sig. (2-tailed)	.204	.539	.000	.042	.275	.448
	N	174	172	173	174	174	174
B6	Pearson Correlation	.200**	.176*	-.037	.058	.111	.365**
	Sig. (2-tailed)	.008	.020	.628	.443	.141	.000
	N	177	175	175	177	177	177
B7	Pearson Correlation	1.000	.164*	-.078	.015	-.017	.244**
	Sig. (2-tailed)	.	.030	.305	.846	.823	.001
	N	177	175	175	177	177	177
B8	Pearson Correlation	.164*	1.000	.086	.055	.054	.191*
	Sig. (2-tailed)	.030	.	.260	.468	.479	.011
	N	175	175	173	175	175	175
B9	Pearson Correlation	-.078	.086	1.000	.168*	.069	-.079
	Sig. (2-tailed)	.305	.260	.	.026	.363	.300
	N	175	173	175	175	175	175
B10	Pearson Correlation	.015	.055	.168*	1.000	.057	.034
	Sig. (2-tailed)	.846	.468	.026	.	.453	.653
	N	177	175	175	177	177	177
B11	Pearson Correlation	-.017	.054	.069	.057	1.000	.101
	Sig. (2-tailed)	.823	.479	.363	.453	.	.183
	N	177	175	175	177	177	177
B12	Pearson Correlation	.244**	.191*	-.079	.034	.101	1.000
	Sig. (2-tailed)	.001	.011	.300	.653	.183	.
	N	177	175	175	177	177	177
B13	Pearson Correlation	.225**	.088	-.078	.095	.099	.401**
	Sig. (2-tailed)	.003	.249	.305	.207	.191	.000
	N	176	174	174	176	176	176
B14	Pearson Correlation	.207**	.169*	.063	.090	.050	.283**
	Sig. (2-tailed)	.006	.025	.405	.231	.508	.000
	N	177	175	175	177	177	177
B15	Pearson Correlation	.108	-.049	.110	-.065	-.035	.083
	Sig. (2-tailed)	.153	.522	.147	.393	.647	.276
	N	176	174	175	176	176	176
B16	Pearson Correlation	.253**	.214**	.054	.037	.063	.351**
	Sig. (2-tailed)	.001	.005	.481	.623	.402	.000
	N	177	175	175	177	177	177
B17	Pearson Correlation	.260**	.226**	.013	.037	-.055	.448**
	Sig. (2-tailed)	.000	.003	.867	.621	.463	.000
	N	177	175	175	177	177	177
B18	Pearson Correlation	.058	.170*	.034	.191*	.333**	.105
	Sig. (2-tailed)	.447	.025	.655	.011	.000	.164
	N	176	174	174	176	176	176

Correlations

		B7	B8	B9	B10	B11	B12
B19	Pearson Correlation	.033	.115	.071	.208**	.165*	.035
	Sig. (2-tailed)	.661	.131	.353	.005	.028	.645
	N	177	175	175	177	177	177
B20	Pearson Correlation	.158*	.482**	.014	.095	.087	.242**
	Sig. (2-tailed)	.035	.000	.849	.210	.249	.001
	N	177	175	175	177	177	177
B21	Pearson Correlation	.063	.246**	.079	.016	.135	.057
	Sig. (2-tailed)	.405	.001	.297	.830	.074	.451
	N	177	175	175	177	177	177
B22	Pearson Correlation	.169*	.308**	.018	.198**	.047	.332**
	Sig. (2-tailed)	.025	.000	.814	.008	.538	.000
	N	177	175	175	177	177	177
B23	Pearson Correlation	.011	.076	.178*	.156*	.139	.124
	Sig. (2-tailed)	.884	.315	.018	.038	.066	.100
	N	177	175	175	177	177	177
B24	Pearson Correlation	.202**	.099	-.095	-.062	.111	.300**
	Sig. (2-tailed)	.007	.194	.209	.410	.141	.000
	N	177	175	175	177	177	177
B25	Pearson Correlation	.188*	.125	.089	.074	.003	.257**
	Sig. (2-tailed)	.012	.099	.245	.331	.973	.001
	N	176	175	174	176	176	176
B26	Pearson Correlation	.282**	.153*	.073	.103	-.027	.167*
	Sig. (2-tailed)	.000	.043	.337	.174	.721	.027
	N	177	175	175	177	177	177
B27	Pearson Correlation	.134	.393**	.082	.087	.161*	.315**
	Sig. (2-tailed)	.076	.000	.278	.247	.032	.000
	N	177	175	175	177	177	177
B28	Pearson Correlation	.311**	.399**	-.071	-.006	-.041	.282**
	Sig. (2-tailed)	.000	.000	.349	.942	.588	.000
	N	176	174	174	176	176	176
B29	Pearson Correlation	.082	-.032	-.004	.011	.199**	.043
	Sig. (2-tailed)	.277	.679	.960	.890	.008	.570
	N	177	175	175	177	177	177
B30	Pearson Correlation	.042	.215**	.018	.033	.268**	.197**
	Sig. (2-tailed)	.581	.004	.812	.663	.000	.009
	N	176	174	174	176	176	176
B31	Pearson Correlation	.044	.115	-.003	.102	.124	.196**
	Sig. (2-tailed)	.560	.133	.969	.181	.102	.009
	N	175	173	173	175	175	175
B32	Pearson Correlation	.072	-.098	-.005	-.103	-.087	.106
	Sig. (2-tailed)	.343	.197	.943	.171	.251	.162
	N	177	175	175	177	177	177
B33	Pearson Correlation	.180*	.170*	-.002	.046	.055	.259**
	Sig. (2-tailed)	.016	.024	.982	.546	.471	.000
	N	177	175	175	177	177	177
B34	Pearson Correlation	.328**	.120	-.212**	-.097	.135	.503**
	Sig. (2-tailed)	.000	.116	.005	.199	.074	.000
	N	176	174	174	176	176	176
B35	Pearson Correlation	.251**	.288**	-.035	.045	.050	.467**
	Sig. (2-tailed)	.001	.000	.644	.549	.508	.000
	N	176	174	174	176	176	176
B36	Pearson Correlation	.206**	.180*	-.033	.094	.000	.355**
	Sig. (2-tailed)	.006	.017	.663	.212	.998	.000
	N	177	175	175	177	177	177

Correlations

		B7	B8	B9	B10	B11	B12
B37	Pearson Correlation	.164*	.223**	-.073	-.046	.204**	.324**
	Sig. (2-tailed)	.029	.003	.338	.544	.007	.000
	N	177	175	175	177	177	177
B38	Pearson Correlation	.129	.211**	-.042	-.056	.172*	.303**
	Sig. (2-tailed)	.087	.005	.579	.459	.022	.000
	N	177	175	175	177	177	177
B39	Pearson Correlation	.096	.087	.055	-.016	.093	.173*
	Sig. (2-tailed)	.204	.255	.473	.827	.221	.022
	N	177	175	175	177	177	177
B40	Pearson Correlation	.269**	.178*	-.173*	-.035	.062	.248**
	Sig. (2-tailed)	.000	.018	.022	.646	.411	.001
	N	177	175	175	177	177	177
B41	Pearson Correlation	.041	.377**	-.101	-.062	.046	.246**
	Sig. (2-tailed)	.593	.000	.187	.418	.545	.001
	N	175	173	173	175	175	175
B42	Pearson Correlation	.136	-.016	.044	-.057	.080	.045
	Sig. (2-tailed)	.074	.838	.564	.455	.294	.557
	N	174	172	173	174	174	174
B43	Pearson Correlation	.200**	.273**	-.051	-.108	.187*	.349**
	Sig. (2-tailed)	.008	.000	.506	.152	.013	.000
	N	177	175	175	177	177	177
B44	Pearson Correlation	.087	.289**	.024	.094	.135	.219**
	Sig. (2-tailed)	.249	.000	.753	.212	.073	.003
	N	177	175	175	177	177	177

Correlations

		B13	B14	B15	B16	B17	B18
B1	Pearson Correlation	.139	.165*	.095	.019	.074	.124
	Sig. (2-tailed)	.066	.028	.210	.798	.326	.101
	N	176	177	176	177	177	176
B2	Pearson Correlation	.127	.062	-.039	.193*	.075	.103
	Sig. (2-tailed)	.097	.421	.609	.011	.329	.180
	N	171	172	171	172	172	171
B3	Pearson Correlation	.264**	.247**	.052	.255**	.388**	.004
	Sig. (2-tailed)	.000	.001	.491	.001	.000	.956
	N	175	176	175	176	176	175
B4	Pearson Correlation	.367**	.253**	-.034	.324**	.418**	.121
	Sig. (2-tailed)	.000	.001	.657	.000	.000	.110
	N	175	176	175	176	176	175
B5	Pearson Correlation	.106	.104	.133	-.045	.086	-.024
	Sig. (2-tailed)	.166	.172	.081	.558	.262	.749
	N	173	174	174	174	174	173
B6	Pearson Correlation	.298**	.160*	-.081	.303**	.308**	.046
	Sig. (2-tailed)	.000	.033	.283	.000	.000	.548
	N	176	177	176	177	177	176
B7	Pearson Correlation	.225**	.207**	.108	.253**	.260**	.058
	Sig. (2-tailed)	.003	.006	.153	.001	.000	.447
	N	176	177	176	177	177	176
B8	Pearson Correlation	.088	.169*	-.049	.214**	.226**	.170*
	Sig. (2-tailed)	.249	.025	.522	.005	.003	.025
	N	174	175	174	175	175	174
B9	Pearson Correlation	-.078	.063	.110	.054	.013	.034
	Sig. (2-tailed)	.305	.405	.147	.481	.867	.655
	N	174	175	175	175	175	174
B10	Pearson Correlation	.095	.090	-.065	.037	.037	.191*
	Sig. (2-tailed)	.207	.231	.393	.623	.621	.011
	N	176	177	176	177	177	176
B11	Pearson Correlation	.099	.050	-.035	.063	-.055	.333**
	Sig. (2-tailed)	.191	.508	.647	.402	.463	.000
	N	176	177	176	177	177	176
B12	Pearson Correlation	.401**	.283**	.083	.351**	.448**	.105
	Sig. (2-tailed)	.000	.000	.276	.000	.000	.164
	N	176	177	176	177	177	176
B13	Pearson Correlation	1.000	.310**	.189*	.371**	.330**	.077
	Sig. (2-tailed)	.	.000	.012	.000	.000	.310
	N	176	176	175	176	176	175
B14	Pearson Correlation	.310**	1.000	.114	.188*	.307**	.149*
	Sig. (2-tailed)	.000	.	.133	.012	.000	.049
	N	176	177	176	177	177	176
B15	Pearson Correlation	.189*	.114	1.000	.000	.091	.035
	Sig. (2-tailed)	.012	.133	.	1.000	.229	.643
	N	175	176	176	176	176	175
B16	Pearson Correlation	.371**	.188*	.000	1.000	.378**	.015
	Sig. (2-tailed)	.000	.012	1.000	.	.000	.843
	N	176	177	176	177	177	176
B17	Pearson Correlation	.330**	.307**	.091	.378**	1.000	.056
	Sig. (2-tailed)	.000	.000	.229	.000	.	.461
	N	176	177	176	177	177	176
B18	Pearson Correlation	.077	.149*	.035	.015	.056	1.000
	Sig. (2-tailed)	.310	.049	.643	.843	.461	.
	N	175	176	175	176	176	176

Correlations

		B13	B14	B15	B16	B17	B18
B19	Pearson Correlation	.142	.089	.119	.121	-.008	.110
	Sig. (2-tailed)	.059	.240	.116	.109	.912	.146
	N	176	177	176	177	177	176
B20	Pearson Correlation	-.004	.125	-.018	.185*	.135	.239**
	Sig. (2-tailed)	.959	.097	.808	.014	.073	.001
	N	176	177	176	177	177	176
B21	Pearson Correlation	.071	.025	.022	.003	.168*	-.002
	Sig. (2-tailed)	.350	.746	.773	.964	.025	.983
	N	176	177	176	177	177	176
B22	Pearson Correlation	.163*	.208**	.010	.230**	.292**	.169*
	Sig. (2-tailed)	.030	.006	.894	.002	.000	.025
	N	176	177	176	177	177	176
B23	Pearson Correlation	.198**	.082	.006	-.014	.067	.292**
	Sig. (2-tailed)	.008	.280	.936	.858	.378	.000
	N	176	177	176	177	177	176
B24	Pearson Correlation	.273**	.135	.139	.265**	.228**	.083
	Sig. (2-tailed)	.000	.074	.066	.000	.002	.275
	N	176	177	176	177	177	176
B25	Pearson Correlation	.301**	.149*	.027	.184*	.178*	-.003
	Sig. (2-tailed)	.000	.049	.723	.014	.018	.973
	N	175	176	175	176	176	175
B26	Pearson Correlation	.280**	.163*	.166*	.197**	.226**	.034
	Sig. (2-tailed)	.000	.030	.027	.009	.002	.656
	N	176	177	176	177	177	176
B27	Pearson Correlation	.204**	.302**	.041	.311**	.261**	.266**
	Sig. (2-tailed)	.007	.000	.592	.000	.000	.000
	N	176	177	176	177	177	176
B28	Pearson Correlation	.302**	.255**	.086	.308**	.288**	.174*
	Sig. (2-tailed)	.000	.001	.257	.000	.000	.022
	N	175	176	175	176	176	175
B29	Pearson Correlation	-.020	.029	.005	-.056	.020	.098
	Sig. (2-tailed)	.792	.703	.942	.456	.790	.194
	N	176	177	176	177	177	176
B30	Pearson Correlation	.221**	.180*	.050	.295**	.209**	.269**
	Sig. (2-tailed)	.003	.017	.510	.000	.005	.000
	N	175	176	175	176	176	175
B31	Pearson Correlation	.085	.109	.098	-.067	.145	.255**
	Sig. (2-tailed)	.266	.153	.196	.376	.056	.001
	N	174	175	174	175	175	174
B32	Pearson Correlation	.083	.008	.312**	-.037	.106	-.019
	Sig. (2-tailed)	.272	.911	.000	.622	.162	.805
	N	176	177	176	177	177	176
B33	Pearson Correlation	.173*	.182*	-.038	.209**	.230**	.138
	Sig. (2-tailed)	.022	.015	.618	.005	.002	.068
	N	176	177	176	177	177	176
B34	Pearson Correlation	.331**	.276**	.067	.215**	.235**	.199**
	Sig. (2-tailed)	.000	.000	.379	.004	.002	.008
	N	175	176	175	176	176	175
B35	Pearson Correlation	.145	.170*	.007	.223**	.266**	.152*
	Sig. (2-tailed)	.056	.024	.926	.003	.000	.045
	N	175	176	175	176	176	175
B36	Pearson Correlation	.243**	.212**	.050	.315**	.326**	.083
	Sig. (2-tailed)	.001	.005	.509	.000	.000	.273
	N	176	177	176	177	177	176

Correlations

		B13	B14	B15	B16	B17	B18
B37	Pearson Correlation	.248**	.118	.110	.257**	.313**	.107
	Sig. (2-tailed)	.001	.116	.146	.001	.000	.157
	N	176	177	176	177	177	176
B38	Pearson Correlation	.171*	.158*	.108	.198**	.311**	.124
	Sig. (2-tailed)	.023	.036	.155	.008	.000	.102
	N	176	177	176	177	177	176
B39	Pearson Correlation	.281**	.171*	.123	.106	.226**	.051
	Sig. (2-tailed)	.000	.023	.104	.160	.002	.504
	N	176	177	176	177	177	176
B40	Pearson Correlation	.254**	.198**	-.039	.293**	.352**	.081
	Sig. (2-tailed)	.001	.008	.610	.000	.000	.285
	N	176	177	176	177	177	176
B41	Pearson Correlation	.167*	.201**	-.022	.240**	.306**	.227**
	Sig. (2-tailed)	.028	.008	.772	.001	.000	.003
	N	174	175	174	175	175	174
B42	Pearson Correlation	.212**	.045	.220**	.015	.058	.006
	Sig. (2-tailed)	.005	.558	.004	.843	.449	.933
	N	173	174	173	174	174	173
B43	Pearson Correlation	.270**	.245**	.025	.308**	.267**	.220**
	Sig. (2-tailed)	.000	.001	.740	.000	.000	.003
	N	176	177	176	177	177	176
B44	Pearson Correlation	.181*	.097	-.240**	.220**	.326**	.276**
	Sig. (2-tailed)	.016	.199	.001	.003	.000	.000
	N	176	177	176	177	177	176

Correlations

		B19	B20	B21	B22	B23	B24
B1	Pearson Correlation	.191*	.139	.114	.067	.019	.112
	Sig. (2-tailed)	.011	.065	.131	.372	.804	.137
	N	177	177	177	177	177	177
B2	Pearson Correlation	.014	.096	.000	.223**	.094	.154*
	Sig. (2-tailed)	.856	.208	.996	.003	.218	.043
	N	172	172	172	172	172	172
B3	Pearson Correlation	-.095	.234**	.161*	.268**	.018	.243**
	Sig. (2-tailed)	.209	.002	.033	.000	.817	.001
	N	176	176	176	176	176	176
B4	Pearson Correlation	-.052	.209**	.109	.270**	.077	.271**
	Sig. (2-tailed)	.495	.005	.149	.000	.310	.000
	N	176	176	176	176	176	176
B5	Pearson Correlation	.050	.062	.086	.262**	.222**	.022
	Sig. (2-tailed)	.513	.419	.259	.000	.003	.768
	N	174	174	174	174	174	174
B6	Pearson Correlation	.002	.155*	.231**	.297**	.162*	.133
	Sig. (2-tailed)	.979	.039	.002	.000	.032	.079
	N	177	177	177	177	177	177
B7	Pearson Correlation	.033	.158*	.063	.169*	.011	.202**
	Sig. (2-tailed)	.661	.035	.405	.025	.884	.007
	N	177	177	177	177	177	177
B8	Pearson Correlation	.115	.482**	.246**	.308**	.076	.099
	Sig. (2-tailed)	.131	.000	.001	.000	.315	.194
	N	175	175	175	175	175	175
B9	Pearson Correlation	.071	.014	.079	.018	.178*	-.095
	Sig. (2-tailed)	.353	.849	.297	.814	.018	.209
	N	175	175	175	175	175	175
B10	Pearson Correlation	.208**	.095	.016	.198**	.156*	-.062
	Sig. (2-tailed)	.005	.210	.830	.008	.038	.410
	N	177	177	177	177	177	177
B11	Pearson Correlation	.165*	.087	.135	.047	.139	.111
	Sig. (2-tailed)	.028	.249	.074	.538	.066	.141
	N	177	177	177	177	177	177
B12	Pearson Correlation	.035	.242**	.057	.332**	.124	.300**
	Sig. (2-tailed)	.645	.001	.451	.000	.100	.000
	N	177	177	177	177	177	177
B13	Pearson Correlation	.142	-.004	.071	.163*	.198**	.273**
	Sig. (2-tailed)	.059	.959	.350	.030	.008	.000
	N	176	176	176	176	176	176
B14	Pearson Correlation	.089	.125	.025	.208**	.082	.135
	Sig. (2-tailed)	.240	.097	.746	.006	.280	.074
	N	177	177	177	177	177	177
B15	Pearson Correlation	.119	-.018	.022	.010	.006	.139
	Sig. (2-tailed)	.116	.808	.773	.894	.936	.066
	N	176	176	176	176	176	176
B16	Pearson Correlation	.121	.185*	.003	.230**	-.014	.265**
	Sig. (2-tailed)	.109	.014	.964	.002	.858	.000
	N	177	177	177	177	177	177
B17	Pearson Correlation	-.008	.135	.168*	.292**	.067	.228**
	Sig. (2-tailed)	.912	.073	.025	.000	.378	.002
	N	177	177	177	177	177	177
B18	Pearson Correlation	.110	.239**	-.002	.169*	.292**	.083
	Sig. (2-tailed)	.146	.001	.983	.025	.000	.275
	N	176	176	176	176	176	176

Correlations

		B19	B20	B21	B22	B23	B24
B19	Pearson Correlation	1.000	.080	-.011	.090	.088	.022
	Sig. (2-tailed)	.	.287	.881	.234	.246	.774
	N	177	177	177	177	177	177
B20	Pearson Correlation	.080	1.000	.091	.365**	.116	.297**
	Sig. (2-tailed)	.287	.	.231	.000	.125	.000
	N	177	177	177	177	177	177
B21	Pearson Correlation	-.011	.091	1.000	.124	.220**	-.005
	Sig. (2-tailed)	.881	.231	.	.100	.003	.946
	N	177	177	177	177	177	177
B22	Pearson Correlation	.090	.365**	.124	1.000	.230**	.170*
	Sig. (2-tailed)	.234	.000	.100	.	.002	.023
	N	177	177	177	177	177	177
B23	Pearson Correlation	.088	.116	.220**	.230**	1.000	.084
	Sig. (2-tailed)	.246	.125	.003	.002	.	.265
	N	177	177	177	177	177	177
B24	Pearson Correlation	.022	.297**	-.005	.170*	.084	1.000
	Sig. (2-tailed)	.774	.000	.946	.023	.265	.
	N	177	177	177	177	177	177
B25	Pearson Correlation	-.035	.212**	.081	.413**	.225**	.230**
	Sig. (2-tailed)	.643	.005	.285	.000	.003	.002
	N	176	176	176	176	176	176
B26	Pearson Correlation	.042	.192*	.132	.367**	.251**	.273**
	Sig. (2-tailed)	.578	.011	.080	.000	.001	.000
	N	177	177	177	177	177	177
B27	Pearson Correlation	.083	.387**	.107	.581**	.194**	.239**
	Sig. (2-tailed)	.272	.000	.155	.000	.010	.001
	N	177	177	177	177	177	177
B28	Pearson Correlation	.189*	.340**	.166*	.316**	.107	.104
	Sig. (2-tailed)	.012	.000	.027	.000	.157	.169
	N	176	176	176	176	176	176
B29	Pearson Correlation	.091	.030	.068	.068	-.089	-.018
	Sig. (2-tailed)	.227	.691	.370	.365	.237	.814
	N	177	177	177	177	177	177
B30	Pearson Correlation	.119	.177*	.063	.191*	.183*	.153*
	Sig. (2-tailed)	.117	.019	.408	.011	.015	.042
	N	176	176	176	176	176	176
B31	Pearson Correlation	.024	.038	.004	.152*	.138	.152*
	Sig. (2-tailed)	.748	.618	.963	.045	.068	.044
	N	175	175	175	175	175	175
B32	Pearson Correlation	-.072	.054	-.088	.122	.036	.125
	Sig. (2-tailed)	.340	.472	.247	.107	.631	.098
	N	177	177	177	177	177	177
B33	Pearson Correlation	.026	.268**	.067	.286**	.109	.153*
	Sig. (2-tailed)	.736	.000	.372	.000	.147	.043
	N	177	177	177	177	177	177
B34	Pearson Correlation	.111	.255**	.000	.281**	.037	.278**
	Sig. (2-tailed)	.141	.001	1.000	.000	.625	.000
	N	176	176	176	176	176	176
B35	Pearson Correlation	.097	.457**	.139	.319**	.164*	.264**
	Sig. (2-tailed)	.201	.000	.066	.000	.030	.000
	N	176	176	176	176	176	176
B36	Pearson Correlation	.208**	.197**	.168*	.278**	.211**	.220**
	Sig. (2-tailed)	.006	.009	.025	.000	.005	.003
	N	177	177	177	177	177	177

Correlations

		B19	B20	B21	B22	B23	B24
B37	Pearson Correlation	.043	.151*	.013	.306**	.042	.315**
	Sig. (2-tailed)	.567	.045	.866	.000	.580	.000
	N	177	177	177	177	177	177
B38	Pearson Correlation	.170*	.297**	.178*	.126	.067	.278**
	Sig. (2-tailed)	.023	.000	.018	.093	.377	.000
	N	177	177	177	177	177	177
B39	Pearson Correlation	.098	.069	.164*	.248**	.099	.261**
	Sig. (2-tailed)	.194	.362	.029	.001	.192	.000
	N	177	177	177	177	177	177
B40	Pearson Correlation	.125	.191*	.208**	.140	.022	.175*
	Sig. (2-tailed)	.099	.011	.006	.064	.774	.020
	N	177	177	177	177	177	177
B41	Pearson Correlation	.045	.318**	.187*	.290**	.205**	.251**
	Sig. (2-tailed)	.553	.000	.013	.000	.007	.001
	N	175	175	175	175	175	175
B42	Pearson Correlation	.094	-.045	.109	.077	.009	.170*
	Sig. (2-tailed)	.218	.557	.153	.314	.906	.025
	N	174	174	174	174	174	174
B43	Pearson Correlation	.156*	.309**	.225**	.245**	.159*	.193**
	Sig. (2-tailed)	.039	.000	.003	.001	.034	.010
	N	177	177	177	177	177	177
B44	Pearson Correlation	.103	.270**	.214**	.357**	.276**	.130
	Sig. (2-tailed)	.172	.000	.004	.000	.000	.083
	N	177	177	177	177	177	177

Correlations

		B25	B26	B27	B28	B29	B30
B1	Pearson Correlation	.095	.102	.064	.048	-.131	.142
	Sig. (2-tailed)	.212	.178	.401	.526	.082	.059
	N	176	177	177	176	177	176
B2	Pearson Correlation	.243**	.281**	.242**	.112	.008	.045
	Sig. (2-tailed)	.001	.000	.001	.146	.913	.558
	N	171	172	172	171	172	171
B3	Pearson Correlation	.176*	.148	.268**	.222**	.020	.183*
	Sig. (2-tailed)	.020	.050	.000	.003	.789	.016
	N	175	176	176	175	176	175
B4	Pearson Correlation	.251**	.228**	.265**	.257**	-.047	.340**
	Sig. (2-tailed)	.001	.002	.000	.001	.534	.000
	N	175	176	176	175	176	175
B5	Pearson Correlation	.170*	.212**	.188*	.101	.023	.123
	Sig. (2-tailed)	.025	.005	.013	.188	.765	.108
	N	173	174	174	173	174	173
B6	Pearson Correlation	.151*	.216**	.157*	.247**	.021	.331**
	Sig. (2-tailed)	.045	.004	.037	.001	.786	.000
	N	176	177	177	176	177	176
B7	Pearson Correlation	.188*	.282**	.134	.311**	.082	.042
	Sig. (2-tailed)	.012	.000	.076	.000	.277	.581
	N	176	177	177	176	177	176
B8	Pearson Correlation	.125	.153*	.393**	.399**	-.032	.215**
	Sig. (2-tailed)	.099	.043	.000	.000	.679	.004
	N	175	175	175	174	175	174
B9	Pearson Correlation	.089	.073	.082	-.071	-.004	.018
	Sig. (2-tailed)	.245	.337	.278	.349	.960	.812
	N	174	175	175	174	175	174
B10	Pearson Correlation	.074	.103	.087	-.006	.011	.033
	Sig. (2-tailed)	.331	.174	.247	.942	.890	.663
	N	176	177	177	176	177	176
B11	Pearson Correlation	.003	-.027	.161*	-.041	.199**	.268**
	Sig. (2-tailed)	.973	.721	.032	.588	.008	.000
	N	176	177	177	176	177	176
B12	Pearson Correlation	.257**	.167*	.315**	.282**	.043	.197**
	Sig. (2-tailed)	.001	.027	.000	.000	.570	.009
	N	176	177	177	176	177	176
B13	Pearson Correlation	.301**	.280**	.204**	.302**	-.020	.221**
	Sig. (2-tailed)	.000	.000	.007	.000	.792	.003
	N	175	176	176	175	176	175
B14	Pearson Correlation	.149*	.163*	.302**	.255**	.029	.180*
	Sig. (2-tailed)	.049	.030	.000	.001	.703	.017
	N	176	177	177	176	177	176
B15	Pearson Correlation	.027	.166*	.041	.086	.005	.050
	Sig. (2-tailed)	.723	.027	.592	.257	.942	.510
	N	175	176	176	175	176	175
B16	Pearson Correlation	.184*	.197**	.311**	.308**	-.056	.295**
	Sig. (2-tailed)	.014	.009	.000	.000	.456	.000
	N	176	177	177	176	177	176
B17	Pearson Correlation	.178*	.226**	.261**	.288**	.020	.209**
	Sig. (2-tailed)	.018	.002	.000	.000	.790	.005
	N	176	177	177	176	177	176
B18	Pearson Correlation	-.003	.034	.266**	.174*	.098	.269**
	Sig. (2-tailed)	.973	.656	.000	.022	.194	.000
	N	175	176	176	175	176	175

Correlations

		B25	B26	B27	B28	B29	B30
B19	Pearson Correlation	-.035	.042	.083	.189*	.091	.119
	Sig. (2-tailed)	.643	.578	.272	.012	.227	.117
	N	176	177	177	176	177	176
B20	Pearson Correlation	.212**	.192*	.387**	.340**	.030	.177*
	Sig. (2-tailed)	.005	.011	.000	.000	.691	.019
	N	176	177	177	176	177	176
B21	Pearson Correlation	.081	.132	.107	.166*	.068	.063
	Sig. (2-tailed)	.285	.080	.155	.027	.370	.408
	N	176	177	177	176	177	176
B22	Pearson Correlation	.413**	.367**	.581**	.316**	.068	.191*
	Sig. (2-tailed)	.000	.000	.000	.000	.365	.011
	N	176	177	177	176	177	176
B23	Pearson Correlation	.225**	.251**	.194**	.107	-.089	.183*
	Sig. (2-tailed)	.003	.001	.010	.157	.237	.015
	N	176	177	177	176	177	176
B24	Pearson Correlation	.230**	.273**	.239**	.104	-.018	.153*
	Sig. (2-tailed)	.002	.000	.001	.169	.814	.042
	N	176	177	177	176	177	176
B25	Pearson Correlation	1.000	.503**	.325**	.152*	-.001	.195**
	Sig. (2-tailed)	.	.000	.000	.044	.985	.010
	N	176	176	176	175	176	175
B26	Pearson Correlation	.503**	1.000	.306**	.228**	-.112	.090
	Sig. (2-tailed)	.000	.	.000	.002	.139	.233
	N	176	177	177	176	177	176
B27	Pearson Correlation	.325**	.306**	1.000	.378**	.045	.273**
	Sig. (2-tailed)	.000	.000	.	.000	.550	.000
	N	176	177	177	176	177	176
B28	Pearson Correlation	.152*	.228**	.378**	1.000	.066	.201**
	Sig. (2-tailed)	.044	.002	.000	.	.383	.008
	N	175	176	176	176	176	175
B29	Pearson Correlation	-.001	-.112	.045	.066	1.000	.013
	Sig. (2-tailed)	.985	.139	.550	.383	.	.865
	N	176	177	177	176	177	176
B30	Pearson Correlation	.195**	.090	.273**	.201**	.013	1.000
	Sig. (2-tailed)	.010	.233	.000	.008	.865	.
	N	175	176	176	175	176	176
B31	Pearson Correlation	.055	.122	.201**	.166*	.106	.109
	Sig. (2-tailed)	.475	.109	.008	.029	.162	.152
	N	174	175	175	174	175	175
B32	Pearson Correlation	.032	.145	.003	.137	-.004	.072
	Sig. (2-tailed)	.675	.054	.971	.070	.962	.346
	N	176	177	177	176	177	176
B33	Pearson Correlation	.115	.075	.386**	.292**	.063	.215**
	Sig. (2-tailed)	.128	.324	.000	.000	.405	.004
	N	176	177	177	176	177	176
B34	Pearson Correlation	.161*	.153*	.308**	.447**	.093	.116
	Sig. (2-tailed)	.033	.043	.000	.000	.221	.127
	N	175	176	176	175	176	176
B35	Pearson Correlation	.243**	.238**	.247**	.392**	.057	.187*
	Sig. (2-tailed)	.001	.001	.001	.000	.450	.013
	N	175	176	176	175	176	175
B36	Pearson Correlation	.268**	.289**	.262**	.334**	-.076	.211**
	Sig. (2-tailed)	.000	.000	.000	.000	.317	.005
	N	176	177	177	176	177	176

Correlations

		B25	B26	B27	B28	B29	B30
B37	Pearson Correlation	.226**	.140	.337**	.150*	.044	.217**
	Sig. (2-tailed)	.003	.063	.000	.048	.557	.004
	N	176	177	177	176	177	176
B38	Pearson Correlation	.189*	.195**	.235**	.347**	.053	.236**
	Sig. (2-tailed)	.012	.009	.002	.000	.486	.002
	N	176	177	177	176	177	176
B39	Pearson Correlation	.361**	.214**	.225**	.127	.041	.241**
	Sig. (2-tailed)	.000	.004	.003	.092	.583	.001
	N	176	177	177	176	177	176
B40	Pearson Correlation	.140	.121	.225**	.367**	.018	.253**
	Sig. (2-tailed)	.064	.110	.003	.000	.810	.001
	N	176	177	177	176	177	176
B41	Pearson Correlation	.242**	.246**	.293**	.287**	-.008	.235**
	Sig. (2-tailed)	.001	.001	.000	.000	.917	.002
	N	174	175	175	174	175	174
B42	Pearson Correlation	.145	.203**	.015	.203**	.152*	.055
	Sig. (2-tailed)	.056	.007	.844	.007	.046	.470
	N	173	174	174	173	174	173
B43	Pearson Correlation	.095	.213**	.253**	.403**	.045	.413**
	Sig. (2-tailed)	.208	.004	.001	.000	.555	.000
	N	176	177	177	176	177	176
B44	Pearson Correlation	.227**	.201**	.266**	.222**	.008	.266**
	Sig. (2-tailed)	.002	.007	.000	.003	.912	.000
	N	176	177	177	176	177	176

Correlations

		B31	B32	B33	B34	B35	B36
B1	Pearson Correlation	.046	.027	-.079	.024	.119	.095
	Sig. (2-tailed)	.549	.716	.297	.755	.115	.208
	N	175	177	177	176	176	177
B2	Pearson Correlation	-.041	.039	.077	.073	.103	.214**
	Sig. (2-tailed)	.593	.616	.317	.344	.180	.005
	N	170	172	172	171	171	172
B3	Pearson Correlation	.155*	.068	.249**	.277**	.403**	.319**
	Sig. (2-tailed)	.042	.370	.001	.000	.000	.000
	N	174	176	176	175	175	176
B4	Pearson Correlation	.145	.026	.140	.240**	.307**	.298**
	Sig. (2-tailed)	.056	.728	.064	.001	.000	.000
	N	174	176	176	175	175	176
B5	Pearson Correlation	.140	.024	-.010	-.011	.129	.131
	Sig. (2-tailed)	.066	.751	.893	.886	.091	.085
	N	172	174	174	173	173	174
B6	Pearson Correlation	.056	.020	.180*	.308**	.264**	.282**
	Sig. (2-tailed)	.460	.788	.017	.000	.000	.000
	N	175	177	177	176	176	177
B7	Pearson Correlation	.044	.072	.180*	.328**	.251**	.206**
	Sig. (2-tailed)	.560	.343	.016	.000	.001	.006
	N	175	177	177	176	176	177
B8	Pearson Correlation	.115	-.098	.170*	.120	.288**	.180*
	Sig. (2-tailed)	.133	.197	.024	.116	.000	.017
	N	173	175	175	174	174	175
B9	Pearson Correlation	-.003	-.005	-.002	-.212**	-.035	-.033
	Sig. (2-tailed)	.969	.943	.982	.005	.644	.663
	N	173	175	175	174	174	175
B10	Pearson Correlation	.102	-.103	.046	-.097	.045	.094
	Sig. (2-tailed)	.181	.171	.546	.199	.549	.212
	N	175	177	177	176	176	177
B11	Pearson Correlation	.124	-.087	.055	.135	.050	.000
	Sig. (2-tailed)	.102	.251	.471	.074	.508	.998
	N	175	177	177	176	176	177
B12	Pearson Correlation	.196**	.106	.259**	.503**	.467**	.355**
	Sig. (2-tailed)	.009	.162	.000	.000	.000	.000
	N	175	177	177	176	176	177
B13	Pearson Correlation	.085	.083	.173*	.331**	.145	.243**
	Sig. (2-tailed)	.266	.272	.022	.000	.056	.001
	N	174	176	176	175	175	176
B14	Pearson Correlation	.109	.008	.182*	.276**	.170*	.212**
	Sig. (2-tailed)	.153	.911	.015	.000	.024	.005
	N	175	177	177	176	176	177
B15	Pearson Correlation	.098	.312**	-.038	.067	.007	.050
	Sig. (2-tailed)	.196	.000	.618	.379	.926	.509
	N	174	176	176	175	175	176
B16	Pearson Correlation	-.067	-.037	.209**	.215**	.223**	.315**
	Sig. (2-tailed)	.376	.622	.005	.004	.003	.000
	N	175	177	177	176	176	177
B17	Pearson Correlation	.145	.106	.230**	.235**	.266**	.326**
	Sig. (2-tailed)	.056	.162	.002	.002	.000	.000
	N	175	177	177	176	176	177
B18	Pearson Correlation	.255**	-.019	.138	.199**	.152*	.083
	Sig. (2-tailed)	.001	.805	.068	.008	.045	.273
	N	174	176	176	175	175	176

Correlations

		B31	B32	B33	B34	B35	B36
B19	Pearson Correlation	.024	-.072	.026	.111	.097	.208**
	Sig. (2-tailed)	.748	.340	.736	.141	.201	.006
	N	175	177	177	176	176	177
B20	Pearson Correlation	.038	.054	.268**	.255**	.457**	.197**
	Sig. (2-tailed)	.618	.472	.000	.001	.000	.009
	N	175	177	177	176	176	177
B21	Pearson Correlation	.004	-.088	.067	.000	.139	.168*
	Sig. (2-tailed)	.963	.247	.372	1.000	.066	.025
	N	175	177	177	176	176	177
B22	Pearson Correlation	.152*	.122	.286**	.281**	.319**	.278**
	Sig. (2-tailed)	.045	.107	.000	.000	.000	.000
	N	175	177	177	176	176	177
B23	Pearson Correlation	.138	.036	.109	.037	.164*	.211**
	Sig. (2-tailed)	.068	.631	.147	.625	.030	.005
	N	175	177	177	176	176	177
B24	Pearson Correlation	.152*	.125	.153*	.278**	.264**	.220**
	Sig. (2-tailed)	.044	.098	.043	.000	.000	.003
	N	175	177	177	176	176	177
B25	Pearson Correlation	.055	.032	.115	.161*	.243**	.268**
	Sig. (2-tailed)	.475	.675	.128	.033	.001	.000
	N	174	176	176	175	175	176
B26	Pearson Correlation	.122	.145	.075	.153*	.238**	.289**
	Sig. (2-tailed)	.109	.054	.324	.043	.001	.000
	N	175	177	177	176	176	177
B27	Pearson Correlation	.201**	.003	.386**	.308**	.247**	.262**
	Sig. (2-tailed)	.008	.971	.000	.000	.001	.000
	N	175	177	177	176	176	177
B28	Pearson Correlation	.166*	.137	.292**	.447**	.392**	.334**
	Sig. (2-tailed)	.029	.070	.000	.000	.000	.000
	N	174	176	176	175	175	176
B29	Pearson Correlation	.106	-.004	.063	.093	.057	-.076
	Sig. (2-tailed)	.162	.962	.405	.221	.450	.317
	N	175	177	177	176	176	177
B30	Pearson Correlation	.109	.072	.215**	.116	.187*	.211**
	Sig. (2-tailed)	.152	.346	.004	.127	.013	.005
	N	175	176	176	176	175	176
B31	Pearson Correlation	1.000	.062	.087	.076	.082	.094
	Sig. (2-tailed)	.	.413	.253	.318	.284	.215
	N	175	175	175	175	174	175
B32	Pearson Correlation	.062	1.000	.097	.196**	.179*	.049
	Sig. (2-tailed)	.413	.	.200	.009	.017	.519
	N	175	177	177	176	176	177
B33	Pearson Correlation	.087	.097	1.000	.291**	.234**	.292**
	Sig. (2-tailed)	.253	.200	.	.000	.002	.000
	N	175	177	177	176	176	177
B34	Pearson Correlation	.076	.196**	.291**	1.000	.507**	.279**
	Sig. (2-tailed)	.318	.009	.000	.	.000	.000
	N	175	176	176	176	175	176
B35	Pearson Correlation	.082	.179*	.234**	.507**	1.000	.455**
	Sig. (2-tailed)	.284	.017	.002	.000	.	.000
	N	174	176	176	175	176	176
B36	Pearson Correlation	.094	.049	.292**	.279**	.455**	1.000
	Sig. (2-tailed)	.215	.519	.000	.000	.000	.
	N	175	177	177	176	176	177

Correlations

		B31	B32	B33	B34	B35	B36
B37	Pearson Correlation	.219**	.098	.200**	.144	.136	.188*
	Sig. (2-tailed)	.004	.194	.007	.057	.071	.012
	N	175	177	177	176	176	177
B38	Pearson Correlation	.101	.094	.211**	.335**	.400**	.271**
	Sig. (2-tailed)	.185	.212	.005	.000	.000	.000
	N	175	177	177	176	176	177
B39	Pearson Correlation	.076	.031	.067	.058	.181*	.191*
	Sig. (2-tailed)	.316	.680	.377	.447	.016	.011
	N	175	177	177	176	176	177
B40	Pearson Correlation	-.045	.012	.259**	.218**	.243**	.257**
	Sig. (2-tailed)	.557	.869	.000	.004	.001	.001
	N	175	177	177	176	176	177
B41	Pearson Correlation	.084	.040	.165*	.264**	.471**	.321**
	Sig. (2-tailed)	.274	.598	.029	.000	.000	.000
	N	173	175	175	174	174	175
B42	Pearson Correlation	.102	.160*	.123	.033	.047	.157*
	Sig. (2-tailed)	.185	.035	.106	.668	.539	.039
	N	172	174	174	173	173	174
B43	Pearson Correlation	.025	.143	.328**	.353**	.375**	.255**
	Sig. (2-tailed)	.741	.057	.000	.000	.000	.001
	N	175	177	177	176	176	177
B44	Pearson Correlation	.111	-.016	.296**	.240**	.280**	.217**
	Sig. (2-tailed)	.143	.830	.000	.001	.000	.004
	N	175	177	177	176	176	177

Correlations

		B37	B38	B39	B40	B41	B42
B1	Pearson Correlation	.160*	.125	.182*	.116	.066	-.013
	Sig. (2-tailed)	.034	.098	.015	.123	.387	.864
	N	177	177	177	177	175	174
B2	Pearson Correlation	.250**	.092	.108	.158*	.083	.107
	Sig. (2-tailed)	.001	.228	.160	.039	.283	.165
	N	172	172	172	172	171	170
B3	Pearson Correlation	.266**	.104	.184*	.152*	.185*	.097
	Sig. (2-tailed)	.000	.168	.014	.044	.015	.204
	N	176	176	176	176	174	173
B4	Pearson Correlation	.210**	.124	.204**	.248**	.266**	.100
	Sig. (2-tailed)	.005	.101	.007	.001	.000	.190
	N	176	176	176	176	174	173
B5	Pearson Correlation	-.035	.033	.213**	-.041	.017	.273**
	Sig. (2-tailed)	.644	.668	.005	.594	.825	.000
	N	174	174	174	174	173	171
B6	Pearson Correlation	.159*	.189*	.153*	.184*	.278**	.114
	Sig. (2-tailed)	.034	.012	.042	.014	.000	.135
	N	177	177	177	177	175	174
B7	Pearson Correlation	.164*	.129	.096	.269**	.041	.136
	Sig. (2-tailed)	.029	.087	.204	.000	.593	.074
	N	177	177	177	177	175	174
B8	Pearson Correlation	.223**	.211**	.087	.178*	.377**	-.016
	Sig. (2-tailed)	.003	.005	.255	.018	.000	.838
	N	175	175	175	175	173	172
B9	Pearson Correlation	-.073	-.042	.055	-.173*	-.101	.044
	Sig. (2-tailed)	.338	.579	.473	.022	.187	.564
	N	175	175	175	175	173	173
B10	Pearson Correlation	-.046	-.056	-.016	-.035	-.062	-.057
	Sig. (2-tailed)	.544	.459	.827	.646	.418	.455
	N	177	177	177	177	175	174
B11	Pearson Correlation	.204**	.172*	.093	.062	.046	.080
	Sig. (2-tailed)	.007	.022	.221	.411	.545	.294
	N	177	177	177	177	175	174
B12	Pearson Correlation	.324**	.303**	.173*	.248**	.246**	.045
	Sig. (2-tailed)	.000	.000	.022	.001	.001	.557
	N	177	177	177	177	175	174
B13	Pearson Correlation	.248**	.171*	.281**	.254**	.167*	.212**
	Sig. (2-tailed)	.001	.023	.000	.001	.028	.005
	N	176	176	176	176	174	173
B14	Pearson Correlation	.118	.158*	.171*	.198**	.201**	.045
	Sig. (2-tailed)	.116	.036	.023	.008	.008	.558
	N	177	177	177	177	175	174
B15	Pearson Correlation	.110	.108	.123	-.039	-.022	.220**
	Sig. (2-tailed)	.146	.155	.104	.610	.772	.004
	N	176	176	176	176	174	173
B16	Pearson Correlation	.257**	.198**	.106	.293**	.240**	.015
	Sig. (2-tailed)	.001	.008	.160	.000	.001	.843
	N	177	177	177	177	175	174
B17	Pearson Correlation	.313**	.311**	.226**	.352**	.306**	.058
	Sig. (2-tailed)	.000	.000	.002	.000	.000	.449
	N	177	177	177	177	175	174
B18	Pearson Correlation	.107	.124	.051	.081	.227**	.006
	Sig. (2-tailed)	.157	.102	.504	.285	.003	.933
	N	176	176	176	176	174	173

Correlations

		B37	B38	B39	B40	B41	B42
B19	Pearson Correlation	.043	.170*	.098	.125	.045	.094
	Sig. (2-tailed)	.567	.023	.194	.099	.553	.218
	N	177	177	177	177	175	174
B20	Pearson Correlation	.151*	.297**	.069	.191*	.318**	-.045
	Sig. (2-tailed)	.045	.000	.362	.011	.000	.557
	N	177	177	177	177	175	174
B21	Pearson Correlation	.013	.178*	.164*	.208**	.187*	.109
	Sig. (2-tailed)	.866	.018	.029	.006	.013	.153
	N	177	177	177	177	175	174
B22	Pearson Correlation	.306**	.126	.248**	.140	.290**	.077
	Sig. (2-tailed)	.000	.093	.001	.064	.000	.314
	N	177	177	177	177	175	174
B23	Pearson Correlation	.042	.067	.099	.022	.205**	.009
	Sig. (2-tailed)	.580	.377	.192	.774	.007	.906
	N	177	177	177	177	175	174
B24	Pearson Correlation	.315**	.278**	.261**	.175*	.251**	.170*
	Sig. (2-tailed)	.000	.000	.000	.020	.001	.025
	N	177	177	177	177	175	174
B25	Pearson Correlation	.226**	.189*	.361**	.140	.242**	.145
	Sig. (2-tailed)	.003	.012	.000	.064	.001	.056
	N	176	176	176	176	174	173
B26	Pearson Correlation	.140	.195**	.214**	.121	.246**	.203**
	Sig. (2-tailed)	.063	.009	.004	.110	.001	.007
	N	177	177	177	177	175	174
B27	Pearson Correlation	.337**	.235**	.225**	.225**	.293**	.015
	Sig. (2-tailed)	.000	.002	.003	.003	.000	.844
	N	177	177	177	177	175	174
B28	Pearson Correlation	.150*	.347**	.127	.367**	.287**	.203**
	Sig. (2-tailed)	.048	.000	.092	.000	.000	.007
	N	176	176	176	176	174	173
B29	Pearson Correlation	.044	.053	.041	.018	-.008	.152*
	Sig. (2-tailed)	.557	.486	.583	.810	.917	.046
	N	177	177	177	177	175	174
B30	Pearson Correlation	.217**	.236**	.241**	.253**	.235**	.055
	Sig. (2-tailed)	.004	.002	.001	.001	.002	.470
	N	176	176	176	176	174	173
B31	Pearson Correlation	.219**	.101	.076	-.045	.084	.102
	Sig. (2-tailed)	.004	.185	.316	.557	.274	.185
	N	175	175	175	175	173	172
B32	Pearson Correlation	.098	.094	.031	.012	.040	.160*
	Sig. (2-tailed)	.194	.212	.680	.869	.598	.035
	N	177	177	177	177	175	174
B33	Pearson Correlation	.200**	.211**	.067	.259**	.165*	.123
	Sig. (2-tailed)	.007	.005	.377	.000	.029	.106
	N	177	177	177	177	175	174
B34	Pearson Correlation	.144	.335**	.058	.218**	.264**	.033
	Sig. (2-tailed)	.057	.000	.447	.004	.000	.668
	N	176	176	176	176	174	173
B35	Pearson Correlation	.136	.400**	.181*	.243**	.471**	.047
	Sig. (2-tailed)	.071	.000	.016	.001	.000	.539
	N	176	176	176	176	174	173
B36	Pearson Correlation	.188*	.271**	.191*	.257**	.321**	.157*
	Sig. (2-tailed)	.012	.000	.011	.001	.000	.039
	N	177	177	177	177	175	174

Correlations

		B37	B38	B39	B40	B41	B42
B37	Pearson Correlation	1.000	.161*	.175*	.178*	.112	.071
	Sig. (2-tailed)	.	.032	.020	.018	.140	.349
	N	177	177	177	177	175	174
B38	Pearson Correlation	.161*	1.000	.251**	.216**	.371**	.049
	Sig. (2-tailed)	.032	.	.001	.004	.000	.518
	N	177	177	177	177	175	174
B39	Pearson Correlation	.175*	.251**	1.000	.063	.225**	.306**
	Sig. (2-tailed)	.020	.001	.	.407	.003	.000
	N	177	177	177	177	175	174
B40	Pearson Correlation	.178*	.216**	.063	1.000	.397**	.084
	Sig. (2-tailed)	.018	.004	.407	.	.000	.270
	N	177	177	177	177	175	174
B41	Pearson Correlation	.112	.371**	.225**	.397**	1.000	.025
	Sig. (2-tailed)	.140	.000	.003	.000	.	.742
	N	175	175	175	175	175	172
B42	Pearson Correlation	.071	.049	.306**	.084	.025	1.000
	Sig. (2-tailed)	.349	.518	.000	.270	.742	.
	N	174	174	174	174	172	174
B43	Pearson Correlation	.227**	.391**	.157*	.431**	.374**	.113
	Sig. (2-tailed)	.002	.000	.036	.000	.000	.138
	N	177	177	177	177	175	174
B44	Pearson Correlation	.198**	.203**	.198**	.252**	.364**	-.037
	Sig. (2-tailed)	.008	.007	.008	.001	.000	.631
	N	177	177	177	177	175	174

Correlations

		B43	B44
B1	Pearson Correlation	.157*	.170*
	Sig. (2-tailed)	.038	.024
	N	177	177
B2	Pearson Correlation	.081	.067
	Sig. (2-tailed)	.292	.382
	N	172	172
B3	Pearson Correlation	.174*	.268**
	Sig. (2-tailed)	.021	.000
	N	176	176
B4	Pearson Correlation	.189*	.269**
	Sig. (2-tailed)	.012	.000
	N	176	176
B5	Pearson Correlation	.087	-.024
	Sig. (2-tailed)	.255	.750
	N	174	174
B6	Pearson Correlation	.219**	.300**
	Sig. (2-tailed)	.003	.000
	N	177	177
B7	Pearson Correlation	.200**	.087
	Sig. (2-tailed)	.008	.249
	N	177	177
B8	Pearson Correlation	.273**	.289**
	Sig. (2-tailed)	.000	.000
	N	175	175
B9	Pearson Correlation	-.051	.024
	Sig. (2-tailed)	.506	.753
	N	175	175
B10	Pearson Correlation	-.108	.094
	Sig. (2-tailed)	.152	.212
	N	177	177
B11	Pearson Correlation	.187*	.135
	Sig. (2-tailed)	.013	.073
	N	177	177
B12	Pearson Correlation	.349**	.219**
	Sig. (2-tailed)	.000	.003
	N	177	177
B13	Pearson Correlation	.270**	.181*
	Sig. (2-tailed)	.000	.016
	N	176	176
B14	Pearson Correlation	.245**	.097
	Sig. (2-tailed)	.001	.199
	N	177	177
B15	Pearson Correlation	.025	-.240**
	Sig. (2-tailed)	.740	.001
	N	176	176
B16	Pearson Correlation	.308**	.220**
	Sig. (2-tailed)	.000	.003
	N	177	177
B17	Pearson Correlation	.267**	.326**
	Sig. (2-tailed)	.000	.000
	N	177	177
B18	Pearson Correlation	.220**	.276**
	Sig. (2-tailed)	.003	.000
	N	176	176

Correlations

		B43	B44
B19	Pearson Correlation	.156*	.103
	Sig. (2-tailed)	.039	.172
	N	177	177
B20	Pearson Correlation	.309**	.270*
	Sig. (2-tailed)	.000	.000
	N	177	177
B21	Pearson Correlation	.225**	.214*
	Sig. (2-tailed)	.003	.004
	N	177	177
B22	Pearson Correlation	.245**	.357*
	Sig. (2-tailed)	.001	.000
	N	177	177
B23	Pearson Correlation	.159*	.276*
	Sig. (2-tailed)	.034	.000
	N	177	177
B24	Pearson Correlation	.193**	.130
	Sig. (2-tailed)	.010	.083
	N	177	177
B25	Pearson Correlation	.095	.227*
	Sig. (2-tailed)	.208	.002
	N	176	176
B26	Pearson Correlation	.213**	.201*
	Sig. (2-tailed)	.004	.007
	N	177	177
B27	Pearson Correlation	.253**	.266*
	Sig. (2-tailed)	.001	.000
	N	177	177
B28	Pearson Correlation	.403**	.222*
	Sig. (2-tailed)	.000	.003
	N	176	176
B29	Pearson Correlation	.045	.008
	Sig. (2-tailed)	.555	.912
	N	177	177
B30	Pearson Correlation	.413**	.266*
	Sig. (2-tailed)	.000	.000
	N	176	176
B31	Pearson Correlation	.025	.111
	Sig. (2-tailed)	.741	.143
	N	175	175
B32	Pearson Correlation	.143	-.016
	Sig. (2-tailed)	.057	.830
	N	177	177
B33	Pearson Correlation	.328**	.296*
	Sig. (2-tailed)	.000	.000
	N	177	177
B34	Pearson Correlation	.353**	.240*
	Sig. (2-tailed)	.000	.001
	N	176	176
B35	Pearson Correlation	.375**	.280*
	Sig. (2-tailed)	.000	.000
	N	176	176
B36	Pearson Correlation	.255**	.217*
	Sig. (2-tailed)	.001	.004
	N	177	177

Correlations

		B43	B44
B37	Pearson Correlation	.227**	.198**
	Sig. (2-tailed)	.002	.008
	N	177	177
B38	Pearson Correlation	.391**	.203**
	Sig. (2-tailed)	.000	.007
	N	177	177
B39	Pearson Correlation	.157*	.198**
	Sig. (2-tailed)	.036	.008
	N	177	177
B40	Pearson Correlation	.431**	.252**
	Sig. (2-tailed)	.000	.001
	N	177	177
B41	Pearson Correlation	.374**	.364**
	Sig. (2-tailed)	.000	.000
	N	175	175
B42	Pearson Correlation	.113	-.037
	Sig. (2-tailed)	.138	.631
	N	174	174
B43	Pearson Correlation	1.000	.321**
	Sig. (2-tailed)	.	.000
	N	177	177
B44	Pearson Correlation	.321**	1.000
	Sig. (2-tailed)	.000	.
	N	177	177

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

APPENDIX 9

L ☐ W ☐ GP 999 Other ☐ ☐ IA ☐

AINTREE STROKE UNIT

ADMINISTRATION FORM (December, 1995)

Centre No: 4445 Patient Reg. No: ☐ Sefton; Liverpool or St H/Knowsley Addr: ☐

Patient Details...	Carer Details ...
DOB	1st carer/contact Address Tel:
Tel	2nd carer/contact Address Tel:

GP NAME AND PRACTICE: (1)
ADDRESS and TEL:

GP NAME AND PRACTICE: (2)
ADDRESS and TEL:

Glasgow Coma Scale:

Eye Opening	- Never	1
	- To pain	2
	- To sound	3
	- Spontaneously	4
Best Motor	- None	1
	- Extend to pain	2
	- Abn flex to pain	3
	- Flex to pain	4
	- Localises pain	5
	- Normal	6
Best Verbal	- None	1
	- Noises only	2
	- Inappropriate	3
	- Confused	4
	- Normal	5

PACEMAKER Y☐ N☐

INAD. SITTING BALANCE Y☐ N☐

REGISTERED BLIND Y☐ N☐

G C S <10 Y☐ N☐

OTHER...

TICK BELOW IF STROKE AS INPATIENT: ☐

REASON FOR ADMISSION: (May be *more than one*)

REASON FOR STROKE: (May be *more than one*)

CURRENT LOCATION: Date:

Ward:

Address & Tel No at discharge (if different):

Consultant At Discharge:

Initial diagnosis of stroke: Definite ☐ Probable ☐ Unlikely ☐ Not stroke ☐ (specify)

Final diagnosis of stroke: Definite ☐ Probable ☐ Unlikely ☐ Not stroke ☐ (specify)

Diagnosis based on: Clinical assessment ☐ Clinical course ☐ Scan ☐

FOLLOW UP (if done, tick box)

In Hospital:
1 week ☐ Disch ☐
1 month ☐ Disch (IA) ☐

Post Stroke:
3 months ☐
6 months ☐
1 year ☐

IAHV ☐ IATH ☐ IAGP ☐

GP LETTER SENT? (Y/N) ☐

PREF = GP ☐ PN ☐ AA ☐

FAZ / ASM / Chased

CHASE3 140296

ESDB
European Stroke DataBase

September '95

Module Level

Source: Ward staff
Timing: On transfer

Centre No ☐☐☐☐☐ **Patient No** ☐☐☐☐☐

? = unknown (no information available)
ND = not documented (but should have been)

Admitting Department

☐

1 = medical 2 = neurological 3 = geriatric
4 = surgical 5 = long stay 6 = rehabilitation
7 = private 8 = stroke unit 9 = boarded out/outlier

Number of inter-ward transfers during initial admission

☐

(if none, go to next pa

Date of 1st transfer ☐☐☐☐☐☐
d d m m y y

Type of unit/ward transferred to

☐

1 = acute medical 2 = neurology 3 = intensive care
4 = neurosurgical 5 = long stay 6 = rehabilitation
7 = private 8 = stroke unit 9 = outlier ("boarded out" on surgical or other ward)

Date of 2nd transfer ☐☐☐☐☐☐
d d m m y y

Type of unit/ward transferred to

☐

1 = acute medical 2 = neurology 3 = intensive care
4 = neurosurgical 5 = long stay 6 = rehabilitation
7 = private 8 = stroke unit 9 = outlier ("boarded out" on surgical or other ward)

Date of 3rd transfer ☐☐☐☐☐☐
d d m m y y

Type of unit/ward transferred to

☐

1 = acute medical 2 = neurology 3 = intensive care
4 = neurosurgical 5 = long stay 6 = rehabilitation
7 = private 8 = stroke unit 9 = outlier ("boarded out" on surgical or other ward)

Final Department

☐

1 = medical 2 = neurological 3 = geriatric
4 = surgical 5 = long stay 6 = rehabilitation
7 = private 8 = stroke unit 9 = boarded out/outlier

September '95

ESDB
European Stroke DataBase

Module
Level

Source: Medical notes/ward staff
Timing: On admission/first visit

Centre No

Patient No

? = unknown (no information available)
NO = not documented (but should have been)

Date of Birth
d d m m y y

or

Age

Sex ☐ M ☐ F

Ethnic Group ☐ Caucasian ☐ Other (specify:)

Onset and Initial Hospital Admission

Onset date
d d m m y y

Time of onset
(24 hr clock: nearest hour)

Admission date
(1st hospital care)
d d m m y y

Time of admission
(24 hr clock: nearest hour)

Time from onset to admission

1 = < 6 hours, 2 = 6 - 24 hours
3 = 1 - 7 days, 4 = not admitted in first week

Type of unit/ward admitted to

1 = acute medical, 2 = neurology, 3 = intensive care,
4 = neurosurgical, 5 = long stay, 6 = rehabilitation,
7 = private, 8 = stroke unit, 9 = outlier ("boarded out") on surgical or other ward

Clinical status on admission

Conscious level

1 = alert 2 = drowsy: responds to speech
3 = stupor: not fully rousable 4 = coma: responds to pain only or no response

Side of body affected

1 = no clear lateralisation signs 2 = right side
3 = left side 4 = both

Degree of limb weakness in affected arm

1 = no deficit 2 = weakness
3 = no movement

Degree of limb weakness in affected leg

1 = no deficit 2 = weakness
3 = no movement

ESDB
European Stroke DataBase

Module
Level

Source: Medical notes/ward staff
Timing: On admission/first visit

Centre No ☐☐☐☐☐   **Patient No** ☐☐☐☐☐

? = unknown (no information available)
ND = not documented (but should have been)

Pre-stroke functional status

Living conditions

☐

1 = private address alone
2 = private address not alone
3 = institution

Employment

☐

1 = paid work
2 = unemployed
3 = retired (previously employed)
4 = housewife (unpaid)

Pre-stroke "Rankin" (Oxford Handicap Scale)

☐

0 = well, no symptoms
1 = minor symptoms, not affecting lifestyle
2 = minor handicap but independent in selfcare
3 = moderate handicap, needing a little help with ADL
4 = needing a lot of help with ADL
5 = needing constant attention day and night

Pre-stroke mobility

☐

1 = able to walk 200m outside
2 = able to walk indoors
3 = unable to walk without help

September '95

ESDB
European Stroke DataBase

Module
Level

Source: Medical notes
Timing: On admission/first visit

Centre No ☐☐☐☐☐

Patient No ☐☐☐☐☐

? = unknown (no information available)
ND = not documented (but should have been)

Risk factors prior to stroke

(Yes "Y"; No "N"; "?"; or "ND")

Atrial fibrillation ☐

Hypertension ☐

Cardiac failure ☐

Myocardial infarction ☐

Angina ☐

Diabetes mellitus ☐

Intermittent claudication ☐

Previous stroke ☐

Transient ischaemic attack ☐

Current smoker ☐

Ex-smoker (stopped) ☐

Alcohol

1 = none
2 = occasional
3 = regular moderate
4 = excessive

☐

Average units of alcohol per week ☐☐☐

Drug medication prior to stroke

(Yes "Y"; No "N"; "?"; or "ND")

Antihypertensive therapy ☐

Antiplatelet therapy ☐

Anticoagulant therapy ☐

Current oral contraceptive use ☐

Hormone Replacement Therapy (HRT) ☐

September '95

ESDB European Stroke DataBase

Module
Level

Source: Medical staff
Timing: On admission/first visit

Centre No ☐☐☐☐☐

Patient No ☐☐☐☐☐

? = unknown (no information available)
ND = not documented (but should have been)

Maximum neurological impairment (due to recent stroke) within first 24hours (or when first seen)

Conscious level

1 = alert
2 = drowsy: responds to speech
3 = stupor: not fully rousable
4 = coma: responds to pain only, or no response

☐

(Yes "Y"; No "N"; "?"; or "ND")

Unilateral weakness(and/or sensory deficit) affecting face ☐

Unilateral weakness(and/or sensory deficit) affecting arm/hand ☐

Unilateral weakness(and/or sensory deficit) affecting leg/foot ☐

Dysphasia ☐

Dysarthria ☐

Mental Impairment/Confusion (not present before the stroke) ☐

Conjugate gaze paresis ☐

Homonymous hemianopia ☐

Visuospatial disorder e.g. sensory inattention ☐

Brainstem/cerebellar signs ☐

Other deficit ☐

OCSP Classification (TACS/PACS/LACS) will be generated automatically by the computer
(0 = Not classifiable 1 = TACS 2 = PACS 3 = LACS 4 = POCS 6 = Unconscious)

September '95

ESDB European Stroke DataBase

Module Level

Source: Medical notes/ward staff
Timing: On discharge

Centre No ☐☐☐☐☐ **Patient No** ☐☐☐☐☐

? = unknown (no information available)
ND = not documented (but should have been)

	Yes	No
"Stroke Salvage" Treatment given?	☐	☐

(i.e. treatment to reduce brain damage due to current stroke)

1st DRUG GIVEN

Class ☐

1 = Antiplatelet 2 = Anticoagulant 3 = Fibrinolytic
4 = Neuroprotective 5 = Anti-oedema 6 = Antiviscosity
7 = Vasoactive 8 = Other

Name of Drug: ______________________________

Is this drug part of a Controlled Trial? Yes ☐ No ☐

When started (hours post onset) ☐
1 = <3hrs 2 = 3-6hrs 3 = 6-12hrs
4 = 12-48hrs 5 = >48hrs

2nd DRUG GIVEN

Class (code as above) ☐

Name of Drug: ______________________________

Is this drug part of a Controlled Trial? Yes ☐ No ☐

When started (hours post onset) ☐
1 = <3hrs 2 = 3-6hrs 3 = 6-12hrs
4 = 12-48hrs 5 = >48hrs

3rd DRUG GIVEN

Class (code as above) ☐

Name of Drug: ______________________________

Is this drug part of a Controlled Trial? Yes ☐ No ☐

When started (hours post onset) ☐
1 = <3hrs 2 = 3-6hrs 3 = 6-12hrs
4 = 12-48hrs 5 = >48hrs

September '95

ESDB
European Stroke DataBase

Module
Level

Source: Ward staff
Timing: End of first week

Centre No ☐☐☐☐☐ **Patient No** ☐☐☐☐☐

Clinical status within first 7 days

Cognitive function

☐

1 = normal
2 = mildly impaired (i.g. forgetful, vague)
3 = confused (e.g. disorientated, abnormal behaviour)
4 = not assessable

Swallowing problems

(Yes , No

Any precaution/restriction needed with giving diet/fluids at any time within the first 7 days? ☐

Urinary function

(Yes , No

Has the patient been incontinent/catheterised at any time within the first 7 days? ☐

Duration of symptoms and signs

☐

1 = deficit still present
2 = resolved between 1 & 7 days
3 = resolved in <24 hours

September 95

ESDB
uropean Stroke DataBase

Module
Level

Source: Ward staff
Timing: End of first week

Centre No ☐☐☐☐☐ **Patient No** ☐☐☐☐☐

Functional status on the 7th day after admission (Barthel ADL Scale)

Bowel function ☐
0 = incontinent (or need enema) 1 = occasional accident
2 = continent

Urinary function ☐
0 = incontinent (or catheter) 1 = occasional accident
2 = continent

Grooming ☐
0 = needs help
1 = independent for face/hair/teeth/shaving

Toilet ☐
0 = dependent 1 = need some help
2 = independent in all actions

Feeding ☐
0 = dependent 1 = need some help
2 = independent in all actions

Transfers from bed to chair ☐
0 = unable to sit out of bed 1 = needs help of 2
2 = needs help of 1 (or supervision) 3 = independent

Mobility ☐
0 = immobile 1 = propel self in wheelchair
2 = walks 50m with help 3 = walks 50m independently

Dressing ☐
0 = dependent 1 = need help, does half
2 = independent (includes buttons, zips, laces)

Stairs ☐
0 = Unable to manage 1 = needs help
2 = independent

Bathing ☐
0 = dependent 1 = independent (or in shower)

ESDB
European Stroke Database

Module F **Source: Ward staff**
Level 1 **Timing: On discharge/transfer**

September '95

Centre No ☐☐☐☐☐ **Patient No** ☐☐☐☐☐

? = unknown (no information available)
ND = not documented (but should have been)

Discharge from Hospital (or Transfer from Acute Care)

Date of discharge from hospital ☐☐☐☐☐☐
d d m m y y

Type of unit/ward discharged from

1 = acute medical 2 = neurology 3 = intensive care
4 = neurosurgical 5 = long stay 6 = rehabilitation
7 = private 8 = stroke unit 9 = outlier, on surgical or other ward

Discharge status

1 = alive 2 = dead (if patient dead, go to next form)

Discharge destination

1 = private address alone 2 = private address not alone
3 = residential home 4 = nursing home
5 = long stay hospital 6 = rehabilitation unit 7 = other hospital department

Functional status at discharge (Items from Barthel ADL Scale)

Cognitive function ☐

1 = normal 2 = confused (ie disorientated, abnormal behaviour)
3 = not assessable

Urinary function ☐

0 = incontinent (or catheter) 1 = occasional accident
2 = continent

Transfers from bed to chair ☐

0 = unable to sit out of bed 1 = needs major help (2 people), but can sit out
2 = needs help of 1 or supervision 3 = independent

Mobility ☐

0 = immobile 1 = propel self in wheelchair
2 = walks 50m with help 3 = walks 50m independently

ESDB European Stroke Database

Module | Source: Ward staff
Level | Timing: On discharge

Centre No ☐☐☐☐☐

Patient No ☐☐☐☐☐

? = unknown (no information available)
ND = not documented (but should have been)

Discharge from Rehabilitation Ward

Date of discharge from hospital ☐☐ ☐☐ ☐☐
d d m m y y

Type of unit/ward discharged from ☐

1 = acute medical,
2 = neurology,
3 = intensive care,
4 = neurosurgical,
5 = long stay,
6 = rehabilitation,
7 = private,
8 = stroke unit,
9 = outlier, on surgical or other ward

Discharge status ☐

1 = alive
2 = dead **(if patient dead, go to next form)**

Discharge destination ☐

1 = private address alone
2 = private address not alone
3 = residential home
4 = nursing home
5 = long stay hospital
6 = rehabilitation unit
7 = other hospital department

Functional status at discharge from Rehab (Items from Barthel ADL Scale)

Cognitive function ☐

1 = normal
2 = confused (ie disorientated, abnormal behaviour)
3 = not assessable

Urinary function ☐

0 = incontinent (or catheter)
1 = occasional accident
2 = continent

Transfers from bed to chair ☐

0 = unable to sit out of bed
1 = needs major help (2 people), but can sit out
2 = needs help (1) or supervision
3 = independent

Mobility ☐

0 = immobile
1 = propel self in wheelchair
2 = walks 50m with help
3 = walks 50m independently

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European Stroke DataBase

October '94

Module G **Source: Medical staff**
Level 1 **Timing: On discharge**

Centre No ☐☐☐☐☐ **Patient No** ☐☐☐☐☐

INVESTIGATIONS AND INTERVENTIONS (during hospital stay)

Diagnostic techniques employed

(Yes or

Brain imaging ☐

Angiography ☐

Doppler ☐

Echocardiogram ☐

Surgical interventions

(Yes or

Neurosurgery ☐

Carotid surgery ☐

Other vascular surgery ☐

DEATHS IN HOSPITAL

☐

1 = patient discharged alive **2 = death directly related to stroke**

3 = death indirectly related to stroke **4 = death unrelated to stroke** **5 = death, unknown relationship to stroke**

(2: Consequence or complication of stroke (Stroke appears in Part I of death certificate)
3: Due to associated condition -e.g. MI- (Stroke appears in Part II of death certificate)
4: Due to unrelated condition -e.g. cancer, accident)

September '95

ESDB
European Stroke DataBase

Module Source: Investigation report
Level Timing: On discharge

Centre No ☐☐☐☐☐ **Patient No** ☐☐☐☐☐

? = unknown (no information available)
ND = not documented (but should have been)

(Yes or No)

Brain imaging results

First scan

Brain scan done? ☐

Relevant lesion seen? ☐

Ischaemic infarct ☐

Haemorrhagic Infarct ☐

Primary intracerebral haemorrhage ☐

Subarachnoid haemorrhage ☐

Tumour ☐

Other ☐

Timing of the first scan

1 = ≤ 24 hours; 2 = 2 to 7 days; 3 = 8 to 14 days 4 = > 2 weeks ☐

☐

(Yes or No)

Any repeat scans during hospital stay? ☐

Repeat scan

Relevant lesion seen? ☐

Ischaemic infarct ☐

Haemorrhagic Infarct ☐

Primary intracerebral haemorrhage ☐

Subarachnoid haemorrhage ☐

Tumour ☐

Other ☐

Timing of repeat scan

1 = ≤ 24 hours; 2 = 2 to 7 days; 3 = 8 to 14 days 4 = > 2 weeks ☐

July 96

ESDB
European Stroke DataBase

Module ?
Level ?

Source: Medical/Nursing Notes
Timing: On discharge

Centre No ☐☐☐☐☐ **Patient No** ☐☐☐☐☐

? = unknown (no information available)
ND = not documented (but should have been)

On Discharge from Hospital (from Acute Care or Rehab)

Secondary Prevention

Blood Pressure?	Y/N	Systolic	Diastolic
Hypertensive on admission (Day 0)			
Hypertensive on Day 4			
Hypertensive on Day 7			
Antihypertensive Medication started		Date commenced antihypertensive med.	

ECG done		
ECG showed Atrial Fibrillation		
Echocardiogram done		
Echocardiogram Normal		
Referral for Carotid Doppler		
Doppler Done		Dateof Carotid Doppler
Aspirin given		Date commenced aspirin
Warfarin given		Date commenced anticoagulation

DOCUMENTED ADVICE:

	Y/N Medical	Y/N Nursing
Smoking		
Alcohol		
Healthy Lifestyle		

Did Patient Drive Previously (Y/N) ☐

Advice About Driving Given (Y/N) ☐

APPENDIX 10

EXPECTATIONS

SUMMARY SHEET:

Patient Name:

Reg No:

PATIENT TESTING SCHEDULE

WEEK 2	Score	DISCHARGE	Score	3 MONTHS	Score
MMSE ☐Ori ☐Reg ☐A/C ☐Rec ☐Lan		GHQ28 ☐A ☐B ☐C ☐D		GHQ28 ☐A ☐B ☐C ☐D	
FAST: ☐Comp ☐Expr ☐Read		OXFORD (CURRENT)		OXFORD (CURRENT)	
GHQ28 ☐A ☐B ☐C ☐D		OXFORD (FUTURE)		QES (A)	
MADRS		GLOBAL PR (B/S/W)		QES (B)	
OXFORD (PAST)		QES (A)		MADRS	
OXFORD (CURRENT)		QES (B)			
GLOBAL PR (B/S/W)					
QES (A)☐ QES (B)☐					

CARER TESTING SCHEDULE

WEEK 2	Score	DISCHARGE	Score	3 MONTHS	Score
BARTHEL (pt) (past)		BARTHEL (pt) (current)		BARTHEL (pt) (current)	
BARTHEL (pt) (current)		GLOBAL PR (B/S/W)(pt)		OXFORD (pt) (future)	
GLOBAL PR (B/S/W)(pt)		OXFORD (pt) (current)		CAREGIVER STRAIN	
OXFORD (pt) (past)		OXFORD (pt) (future)		QES (A)	
		CAREGIVER STRAIN		QES (B)	
		QES (A)			
		QES (B)			

STAFF TESTING SCHEDULE

WEEK 2	Score	DISCHARGE	Score	3 MONTHS	Score
BARTHEL (CURRENT)		BARTHEL (CURRENT)		BARTHEL (CURRENT)	
OXFORD (FUTURE)		OXFORD (CURRENT)		OXFORD (CURRENT)	
GLOBAL PR (B/S/W)		OXFORD (FUTURE)			
QES (A)		GLOBAL PR (B/S/W)			
QES (B)					

MISCELLANEOUS

SEVERITY OF STROKE

APPENDIX 11

FORM FOR WRITTEN CONSENT FROM PATIENT

Study Title:	RESEARCH PROJECT: EXPECTATIONS OF RECOVERY FROM STROKE
Study Site:	Fazakerley Hospital, Liverpool
Researcher:	Caroline Watkins - Nurse / Psychologist

I, (Name, block letters)

Have read the attached explanation, have discussed the study it concerns with

Caroline Watkins and understand what the study involves and that I can withdraw from the study at any time (without giving reasons).

I am willing to participate in the study.

Signed: .... **Date:** ....

I, (Name of investigator in block letters)

CAROLINE WATKINS

Have explained the nature and purpose of the study to:

Signed: .... Date: ....
(Investigator's signature)

RESEARCH PROJECT: EXPECTATIONS OF RECOVERY FROM STROKE

Department of Medicine for the Elderly, Fazakerley Hospital, Lower Lane, Liverpool
L9 7AL

Patient Information Sheet

We are inviting you to take part in a study looking at your ideas about strokes:

People have many different ideas about why they became ill and what will help them to get better.

We think that it is important for hospital staff to take patients views into account when planning treatment, because what is right for one person may not be right for another. We would like to come to see you a few times in the next few months to find out how you are getting on and how you feel you will be in the future. We will also need to know the sort of things you could do before you had your stroke and what you think will help you to get better. We are trying to find out more about the sort of mental attitudes that help people to get better and hope that you will find it helpful as well. Anything you tell us will be kept strictly confidential and if you prefer us not to visit you it will not affect your treatment in any way.

You are free to refuse to take part at any time or to stop at any time. Please be assured that the high standard of normal treatment will not be affected in any way if you decide not to take part.

You will continue to receive the best care and attention available.

Indemnity;

Aintree Hospitals NHS Trust is instituting research relating to expectations of recovery from stroke. The purpose of the research project is to find out more about the relationship between mental attitudes towards procedures detailed above. You have expressed your willingness to participate as a patient in order to assist in this research project. It has been explained to you and you understand that your participation is entirely voluntary and that the Trust cannot accept responsibility for any injury or loss that might result, although it has been explained to you that the risk of any such injury or loss is extremely small.

If of course, you sustain any injury or loss as a result of any negligence or breach of duty on the part of the Trust or any of its servants, agents or employees then the Trust may be liable to compensate you in the normal way.

FORM FOR WRITTEN CONSENT FROM CARER

Study Title: RESEARCH PROJECT: EXPECTATIONS OF RECOVERY FROM STROKE

Study Site: Fazakerley Hospital, Liverpool

Researcher: Caroline Watkins - Nurse / Psychologist

I, (Name, block letters)

Have read the attached explanation, have discussed the study it concerns with

Caroline Watkins and understand what the study involves and that I can withdraw from the study at any time (without giving reasons).

I am willing to participate in the study.

Signed: .... **Date:** ....

I, (Name of investigator in block letters)

CAROLINE WATKINS

Have explained the nature and purpose of the study to:

Signed: .... Date: ....
(Investigator's signature)

RESEARCH PROJECT: EXPECTATIONS OF RECOVERY FROM STROKE

Department of Medicine for the Elderly, Fazakerley Hospital, Lower Lane, Liverpool
L9 7AL

Carer Information Sheet

We are inviting you to take part in a study looking at your ideas about strokes:

People have many different ideas about why they became ill and what will help them to get better.

We think that it is important for hospital staff to take patients views into account when planning treatment, because what is right for one person may not be right for another. We would like to come to see you a few times in the next few months to find out how you and .... are getting on and how you feel they will be in the future. We will also need to know the sort of things they could do before they had their stroke and what you think will help them to get better. We are trying to find out more about the sort of mental attitudes that help people to get better and hope that you and .... will find it helpful as well. Anything you tell us will be kept strictly confidential and if you prefer us not to visit you it will not affect .... treatment in any way.

You are free to refuse to take part at any time or to stop at any time. Please be assured that the high standard of normal treatment will not be affected in any way if you decide not to take part.

.... will continue to receive the best care and attention available.

Indemnity;

Aintree Hospitals NHS Trust is instituting research relating to expectations of recovery from stroke. The purpose of the research project is to find out more about the relationship between mental attitudes towards procedures detailed above. You have expressed your willingness to participate as a carer in order to assist in this research project. It has been explained to you and you understand that your participation is entirely voluntary and that the Trust cannot accept responsibility for any injury or loss that might result, although it has been explained to you that the risk of any such injury or loss is extremely small.

If of course, you sustain any injury or loss as a result of any negligence or breach of duty on the part of the Trust or any of its servants, agents or employees then the Trust may be liable to compensate you in the normal way.

APPENDIX 12

[illegible].6
[illegible]

[15.2.95] file

South Sefton Research Ethics Committee
c/o Infectious Diseases Unit
Fazakerley Hospital
Lower Lane
Liverpool L9 7AL

[Please quote our reference in reply]

Chairman: Dr.P.Charters
Secretary: Mrs.L.Adamson *Tel:* 051-529-2405 *Fax:* 051-529-3762

PC/LA/EC.66.94

Your ref: **FAZ/CE/MM/EXPECT**

MINUTE 94.34.3
15.03.95

22nd February 1995

Ms. C. Watkins,
Research Assistant,
Dept. of Medicine for the Elderly,
Fazakerley Hospital

Expired
Aug 1996

Dear Ms. Watkins,

EC.66.94: RESEARCH PROJECT "DO PATIENTS' BELIEFS AND EXPECTATIONS INFLUENCE RECOVERY FROM STROKE ?"

Thank you for providing the final version of a Stroke Expectations Questionnaire copies of which which were tabled at our meeting on 15th February 1995. Unfortunately, there was insufficient time for discussion with members but it was agreed under the circumstances, as there had been no objections raised to the previously revised documents (which were presented to the Committee at our meeting held on 25th January 1995), that Chairman's Action might be taken, if appropriate, in granting APPROVAL. There do not appear to be any problems with the definitive Questionnaire from an ethical viewpoint and I am therefore very pleased to be able to grant APPROVAL for you to commence your project.

APPROVAL is given for a period up to eighteen months; if, in the meantime, the study is completed or there are any adverse events, changes in personnel or amendments to the documents approved by the Committee, please let me know.

The Committee wishes you success with the study and would be interested to receive a copy of your final report in due course.

Yours sincerely,

Dr.P.Charters
Chairman
South Sefton Research Ethics Committee

Copy to Dr.A.K.Sharma

FAX DOCUMENT

DATE: 19 August 1999

FROM:

Mrs.L.Adamson
South Sefton Research Ethics Committee

Tel: *(0151) 529 5668*
Fax: *(0151) 529 5504*

TO: CAROLINE WATKINS
STROKE UNIT, UHA

FAX: 3787

Number of pages including this sheet: 2

MESSAGE: Re: EC.66.94: Copy of formal letter of approval dated 22 February 1995, as requested. Please note our file copy does not have the signature of the Chairman but I can confirm that the original will have been signed by Dr.Charters

Lyn Adamson

APPENDIX 13

Correlation between SEQ at week2 and Outcomes at 3 months

Correlations

		seq wk2 help 15 items total	seq wk2 happen 15 items total	wk2 diff a & b 15 items	barthel at 3 months
seq wk2 help 15 items total	Pearson Correlation	1.000	.459**	.285**	.019
	Sig. (2-tailed)	.	.000	.002	.845
	N	119	114	114	108
seq wk2 happen 15 items total	Pearson Correlation	.459**	1.000	-.585**	.228*
	Sig. (2-tailed)	.000	.	.000	.016
	N	114	121	119	111
wk2 diff a & b 15 items	Pearson Correlation	.285**	-.585**	1.000	-.092
	Sig. (2-tailed)	.002	.000	.	.340
	N	114	119	119	109
barthel at 3 months	Pearson Correlation	.019	.228*	-.092	1.000
	Sig. (2-tailed)	.845	.016	.340	.
	N	108	111	109	117
MMADTOT	Pearson Correlation	.073	-.225	.177	-.262*
	Sig. (2-tailed)	.549	.059	.142	.024
	N	69	71	70	74
TTGHQ3M	Pearson Correlation	-.011	-.175	.176	-.054
	Sig. (2-tailed)	.917	.087	.089	.596
	N	92	96	94	99
TTGHQ3MS	Pearson Correlation	.016	-.166	.165	-.018
	Sig. (2-tailed)	.881	.107	.113	.863
	N	92	96	94	99
length of stay in hospital	Pearson Correlation	-.026	-.179*	.147	-.545**
	Sig. (2-tailed)	.779	.049	.112	.000
	N	119	121	119	117

Correlations

		MMADTOT	TTGHQ3M	TTGHQ3MS	length of stay in hospital
seq wk2 help 15 items total	Pearson Correlation	.073	-.011	.016	-.026
	Sig. (2-tailed)	.549	.917	.881	.779
	N	69	92	92	119
seq wk2 happen 15 items total	Pearson Correlation	-.225	-.175	-.166	-.179*
	Sig. (2-tailed)	.059	.087	.107	.049
	N	71	96	96	121
wk2 diff a & b 15 items	Pearson Correlation	.177	.176	.165	.147
	Sig. (2-tailed)	.142	.089	.113	.112
	N	70	94	94	119
barthel at 3 months	Pearson Correlation	-.262*	-.054	-.018	-.545**
	Sig. (2-tailed)	.024	.596	.863	.000
	N	74	99	99	117
MMADTOT	Pearson Correlation	1.000	.724**	.737**	.122
	Sig. (2-tailed)	.	.000	.000	.299
	N	74	74	74	74
TTGHQ3M	Pearson Correlation	.724**	1.000	.971**	-.037
	Sig. (2-tailed)	.000	.	.000	.719
	N	74	99	99	99
TTGHQ3MS	Pearson Correlation	.737**	.971**	1.000	-.091
	Sig. (2-tailed)	.000	.000	.	.371
	N	74	99	99	99
length of stay in hospital	Pearson Correlation	.122	-.037	-.091	1.000
	Sig. (2-tailed)	.299	.719	.371	.
	N	74	99	99	128

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Correlation of SEQ Happen at week2 and Length of Stay in Hospital controlling for Severity of Stroke (Barthel day7)

```
- - -  P A R T I A L   C O R R E L A T I O N   C O E F F I C I E N T S  - - -

Controlling for..     TOTBI7

              WPQB15T        LOS

WPQB15T        1.0000      -.1006
              (     0)     (  118)
              P= .         P= .274

LOS           -.1006       1.0000
              (  118)     (     0)
              P= .274      P= .

(Coefficient / (D.F.) / 2-tailed Significance)

" . " is printed if a coefficient cannot be computed
```

APPENDIX 14

Nonparametric Correlations between Possible Predictor Variables at week2

Correlations

			AGEPAT	SEX	PRERANK
Spearman's rho	AGEPAT	Correlation Coefficient	1.000	.135	.160
		Sig. (2-tailed)	.	.128	.071
		N	128	128	128
	SEX	Correlation Coefficient	.135	1.000	.149
		Sig. (2-tailed)	.128	.	.093
		N	128	128	128
	PRERANK	Correlation Coefficient	.160	.149	1.000
		Sig. (2-tailed)	.071	.093	.
		N	128	128	128
	previous stroke	Correlation Coefficient	-.097	-.090	.235**
		Sig. (2-tailed)	.275	.315	.008
		N	128	128	128
	barthel at day 7	Correlation Coefficient	-.182*	-.154	-.052
		Sig. (2-tailed)	.040	.083	.561
		N	128	128	128
	NEG	Correlation Coefficient	-.159	-.034	.013
		Sig. (2-tailed)	.073	.707	.888
		N	128	128	128
	WMADTOT	Correlation Coefficient	-.080	.075	-.124
		Sig. (2-tailed)	.396	.429	.189
		N	114	114	114
	WGHQTOT	Correlation Coefficient	-.016	.174	.114
		Sig. (2-tailed)	.866	.058	.214
		N	120	120	120
	seq wk2 help 15 items total	Correlation Coefficient	-.092	-.184*	-.098
		Sig. (2-tailed)	.321	.046	.287
		N	119	119	119
	seq wk2 happen 15 items total	Correlation Coefficient	-.063	-.139	-.039
		Sig. (2-tailed)	.491	.128	.669
		N	121	121	121

Correlations

			previous stroke	barthel at day 7	NEG
Spearman's rho	AGEPAT	Correlation Coefficient	-.097	-.182*	-.159
		Sig. (2-tailed)	.275	.040	.073
		N	128	128	128
	SEX	Correlation Coefficient	-.090	-.154	-.034
		Sig. (2-tailed)	.315	.083	.707
		N	128	128	128
	PRERANK	Correlation Coefficient	.235**	-.052	.013
		Sig. (2-tailed)	.008	.561	.888
		N	128	128	128
	previous stroke	Correlation Coefficient	1.000	.183*	.148
		Sig. (2-tailed)	.	.039	.095
		N	128	128	128
	barthel at day 7	Correlation Coefficient	.183*	1.000	-.046
		Sig. (2-tailed)	.039	.	.609
		N	128	128	128
	NEG	Correlation Coefficient	.148	-.046	1.000
		Sig. (2-tailed)	.095	.609	.
		N	128	128	128
	WMADTOT	Correlation Coefficient	.066	-.145	-.095
		Sig. (2-tailed)	.485	.123	.313
		N	114	114	114
	WGHQTOT	Correlation Coefficient	.061	-.254**	-.066
		Sig. (2-tailed)	.506	.005	.471
		N	120	120	120
	seq wk2 help 15 items total	Correlation Coefficient	-.030	.141	.128
		Sig. (2-tailed)	.745	.126	.166
		N	119	119	119
	seq wk2 happen 15 items total	Correlation Coefficient	-.027	.141	.013
		Sig. (2-tailed)	.771	.124	.891
		N	121	121	121

Correlations

			WMADTOT	WGHQTOT
Spearman's rho	AGEPAT	Correlation Coefficient	-.080	-.016
		Sig. (2-tailed)	.396	.866
		N	114	120
	SEX	Correlation Coefficient	.075	.174
		Sig. (2-tailed)	.429	.058
		N	114	120
	PRERANK	Correlation Coefficient	-.124	.114
		Sig. (2-tailed)	.189	.214
		N	114	120
	previous stroke	Correlation Coefficient	.066	.061
		Sig. (2-tailed)	.485	.506
		N	114	120
	barthel at day 7	Correlation Coefficient	-.145	-.254**
		Sig. (2-tailed)	.123	.005
		N	114	120
	NEG	Correlation Coefficient	-.095	-.066
		Sig. (2-tailed)	.313	.471
		N	114	120
	WMADTOT	Correlation Coefficient	1.000	.641**
		Sig. (2-tailed)	.	.000
		N	114	107
	WGHQTOT	Correlation Coefficient	.641**	1.000
		Sig. (2-tailed)	.000	.
		N	107	120
	seq wk2 help 15 items total	Correlation Coefficient	.028	-.218*
		Sig. (2-tailed)	.775	.021
		N	105	111
	seq wk2 happen 15 items total	Correlation Coefficient	-.289**	-.331**
		Sig. (2-tailed)	.002	.000
		N	108	114

Correlations

			seq wk2 help 15 items total	seq wk2 happen 15 items total
Spearman's rho	AGEPAT	Correlation Coefficient	-.092	-.063
		Sig. (2-tailed)	.321	.491
		N	119	121
	SEX	Correlation Coefficient	-.184*	-.139
		Sig. (2-tailed)	.046	.128
		N	119	121
	PRERANK	Correlation Coefficient	-.098	-.039
		Sig. (2-tailed)	.287	.669
		N	119	121
	previous stroke	Correlation Coefficient	-.030	-.027
		Sig. (2-tailed)	.745	.771
		N	119	121
	barthel at day 7	Correlation Coefficient	.141	.141
		Sig. (2-tailed)	.126	.124
		N	119	121
	NEG	Correlation Coefficient	.128	.013
		Sig. (2-tailed)	.166	.891
		N	119	121
	WMADTOT	Correlation Coefficient	.028	-.289**
		Sig. (2-tailed)	.775	.002
		N	105	108
	WGHQTOT	Correlation Coefficient	-.218*	-.331**
		Sig. (2-tailed)	.021	.000
		N	111	114
	seq wk2 help 15 items total	Correlation Coefficient	1.000	.478**
		Sig. (2-tailed)	.	.000
		N	119	114
	seq wk2 happen 15 items total	Correlation Coefficient	.478**	1.000
		Sig. (2-tailed)	.000	.
		N	114	121

*. Correlation is significant at the .05 level (2-tailed).

**. Correlation is significant at the .01 level (2-tailed).

APPENDIX 15

Beta co-efficients, cut points (where appropriate), and constant terms pertaining to the Tables indicated

Table 42 Multiple regression models to predict 3 month Barthel score

	Percentage of variance accounted for by each Model					
Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Barthel at day 7	**39** .63	**40** .63	**40** .63	**40** .62	**39** .63	**38** .65
Age	-.06	-.06	-.07	-.07	-.08	
SEQ Happen	-.09	.09	.09	.09		
Visuo-spatial Inattention	.76	.77	.73			
Pre-stroke Rankin	-.24	-.26				
Sex	-.40.					
Constant	6.61	5.89	6.07	6.85	12.88	6.98

N=122, 6 not contactable

Table 43 Multiple regression models to predict change in Barthel score from week 2 to 3 months post-stroke

	Percentage of variance accounted for by each Model					
Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Barthel at day 7	**7** -.31	**8** -.31	**8** -.31	**8** -.30	**7** -.28	**7** -.29
Visuo-spatial Inattention	1.65	1.65	1.62	1.63	1.84	
Age	-.07	-.07	-.08	-.08		
SEQ Happen	.09	.09	.09			
Pre-stroke Rankin	-.23	-.23				
Sex	.02					
Constant	4.73	4.78	4.94	11.11	4.86	5.88

N=122, 6 not contactable

Table 44 Multiple regression models to predict MADRS score at 3 months post-stroke

	Percentage of variance accounted for by each Model					
Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
SEQ Happen	**1** -.25	**3** -.24	**3** -.25	**4** -.25	**3** -.26	**3** -.25
Age	-.15	-.16	-.14	-.12	-.11	
Visuo-spatial Inattention	-2.57	-2.55	-2.40	-2.10		
Barthel at day 7	-.18	-.17	-.17			
Pre-stroke Rankin	.74	.73				
Sex	-.60					
Constant	37.86	36.47	36.34	32.91	32.00	22.88

N=74, 6 not contactable, 5 dead, 18 unable/unwilling, 25 only seen by Research Assistant (no assessment by Psychologist)

W

Table 45 Multiple regression models to predict GHQ 28 score at 3 months post-stroke

	Percentage of variance accounted for by each Model					
Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
SEQ Happen	**0** -.18	**1** -.18	**2** -.18	**3** -.17	**4** -.18	**2** -.17
Barthel at day 7	-.04	-.04	-.03	-.02	-.18	
Pre-stroke Rankin	.35	.35	.34	-.02		
Age	-.15	-.15	-.15			
Visuo-spatial Inattention	-.25	-.25				
Sex	.01					
Constant	30.05	30.07	29.91	19.22	29.08	18.94

N=99, 6 not contactable, 5 dead, 18 unable/unwilling

7

Table 46 Multiple regression models to predict Rankin score at 3 months post-stroke

	Percentage of variance accounted for by each Model					
Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Barthel at day 7	**25** -.10	**26** -.10	**26** -.10	**25** -.11	**24** -.10	**22** -.11
Sex	.32	.32	.35	.38	.42	
Pre-stroke Rankin	.16	.16	.16	.19		
Age	.02	.02	.02			
SEQ Happen	-.01	-.01				
Visuo-spatial Inattention	-.09					
Constant	3.27	3.17	2.18	3.35	3.40	4.09

N=122, 6 not contactable

5

Table 47 Logistic regression models to predict good or bad outcome at 3 months post-stroke

	Sensitivity (Se) and Specificity (Sp) of each Model (%) [overall percent correct]											
Variables	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	Se	Sp	Se	Sp	Se	Sp	Se	Sp	Se	Sp	Se	Sp
Barthel at day 7	**91** **[77]** .21	**44**	**90** **[77]** .20	**44**	**94** **[80]** .20	**47**	**92** **[78]** .20	**44**	**90** **[76]** .21	**44**	**84** **[71]** .17	**42**
Age	.07		.08		.07		.07		.06			
Pre-stroke Rankin	-.55		-.52		-.50		-.37					
SEQ Happen	.05		.05		.05							
Visuo-spatial Inattention	.65		.64									
Sex	-.12											
Constant	-12.19		-12.13		-11.87		-8.13		-7.73		-3.06	