An investigation of meta-cognitive dimensions of worry in a sample of people with genital herpes.

A thesis submitted in partial fulfilment for the degree of Doctorate in Clinical Psychology

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ABSTRACT

A recent cognitive model of worry has proposed that meta-worry (worry about worry) and negative meta-cognitive beliefs about worry are strongly implicated in the maintenance of emotional disorder. Elevated levels of worry have been widely reported in people experiencing chronic health problems where prognosis and outcome are uncertain and unpredictable. Genital herpes is an incurable sexually transmitted disease characterised by recurrent outbreaks of symptoms. Recent research examining the relationship between stress and symptom recurrence in genital herpes suggests that moderate levels of stress, including worry, are predictive of symptom recurrence. The aims of this study were to: explore the relationships between emotional vulnerability and meta-cognitive dimensions of worry in people with recurrent genital herpes (RGH) (n=41) and a normal healthy control group (n=41); examine differences in emotional vulnerability and meta-cognitive dimension of worry between RGH participants and controls; and, explore relationships between emotional vulnerability, meta-cognitive dimensions of worry and quality of life for RGH participants. A survey design was used. The results replicated many of the findings between emotional vulnerability and meta-cognitive dimensions of worry found in previous research providing convergent evidence for the meta-cognitive model. The results also revealed significant between group differences in emotional vulnerability, meta-worry, and other meta-cognitive beliefs about worry but no significant differences in maladaptive thought control strategies. Within RGH group correlations revealed that negative beliefs about worry were significantly negatively correlated with quality of life when trait anxiety was partialled out. The implications of the results are discussed in terms of clinical implications and the limitations of the study.

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1.0 LITERATURE REVIEW

1.1 Introduction

Chronic health problems are increasingly prevalent in modern society and can challenge patients' views of life as orderly and having continuity since neither the health problem nor its consequences remain static (Holman & Lorig, 2000; cited in White, 2001). Most patients adjust well to the psychosocial aspects of their chronic health problem, however, approximately 20-25% of patients experience clinically significant psychological problems (Salmon, 2000).

When an individual is faced with a situation that is uncontrollable and possibly threatening, such as having a chronic illness, the opportunities for worry to develop as a coping strategy are present (Wells, 2000). Despite evidence that worry is a common problem in people who consult family practitioners (Davey & Tallis, 1994) and that people with chronic health problems experience high levels of worry (e.g. Fortune, Richards, Main & Griffiths, 1999; Aldrich Eclleston & Crombez, 2000), little is known about the process or underlying mechanisms of worry in patients with chronic diseases.

Worrying is a ubiquitous psychological experience, viewed as having both adaptive and maladaptive qualities (Davey, 1994; Wells, 2000). Recently, a cognitive model of worry in Generalised Anxiety Disorder (GAD) (Diagnostic and Statistical manual of Mental disorders 4th Edition (DSM-IV), APA, 1994), an emotional disorder characterised by excessive and uncontrollable worry, has been described (Wells,

1995). Research investigating this model has shown that meta-cognitive dimensions of worry, specifically meta-worry (i.e. worry about worry) and negative beliefs about the uncontrollability and danger of worry, are implicated in the development and maintenance of pathological worry in GAD (Wells, 2000).

Genital herpes a chronic, incurable and recurrent sexually transmitted disease (STD) has been found to have a number of different psychological sequelae (Green & Koscis, 1997; Shah & Button, 1998). There is also some evidence that stress may be implicated in symptom recurrence. For example, moderate levels of stress, including worrying thoughts, have been found to precede recurrence of genital herpes symptoms (Cohen, Kemeny, Kearney, Zegans, Neuhas & Conant, 1999). However, little is known about the nature and correlates of worry with regard to recurrent genital herpes (RGH). Furthermore appropriate assessment and management of the psychological needs of sexual health service users has recently been highlighted by the government (DoH, 2001)

The overall aim of this study was to explore meta-cognitive dimensions of worry in people with a diagnosis of genital herpes and a normal control group. The first aim of this study is to explore the relationships between the meta-cognitive variables implicated in pathological worry, and measures of emotional vulnerability and distress in order to evaluate whether the relationships found in previous studies can be replicated within this study (Cartwright-Hatton & Wells, 1997; Wells & Papageorgiou, 1998). Emotional vulnerability refers to trait emotional pathology, or the general tendency of an individual to be anxious or worried, whilst emotional distress refers to state or current levels of distress (Wells, 2001). Furthermore,

research has shown that certain meta-cognitive dimensions of worry predict pathological worry independently of trait anxiety (Cartwright-Hatton & Wells, 1997). The second aim of the study was to explore the relationships between emotional vulnerability and distress, meta-cognitive dimensions of worry, thought control strategies and quality of life controlling for the contribution of trait anxiety. Finally, research has reported elevated rates of worry in people with chronic health problems (e.g. Fortune et al., 2000) and moderate stress levels, including worry, in people with recurrent genital herpes (RGH) (Cohen et al., 1999). Given these findings, a third aim was to examine differences in emotional vulnerability, metacognitive dimensions of worry and thought control strategies between participants with RGH and a normal (healthy) control group. It is predicted that meta-cognitive dimensions of worry in line with the Self-Regulatory Executive Function (S-REF) model of emotional disorder (Wells & Matthew's, 1994), will be variables that differentiate between groups of patients who are emotionally vulnerable, experiencing higher levels of emotional distress and poorer quality of life.

The aim of this literature review will be to describe research investigating worry, focussing on a meta-cognitive model of worry (Wells, 1995, 1997) which proposes that meta-cognitive beliefs about worry and maladaptive thought control strategies are central to the development and maintenance of worry. Literature describing worry in relation to chronic disease will then be outlined. Following this a description of the clinical features of genital herpes will be given followed by a summary of research reporting psychopathology associated with genital herpes, the relationship between stress and symptom recurrence and quality of life. At the end of this section, a brief summary of the literature will be provided, followed by the hypotheses for this study.

1.2 The nature of worry

1.2.1 Definitions of Worry

Freud (1894, cited in Freud 1957) provided one of the first descriptions of worry when he outlined a distinct syndrome, which he termed "anxiety neurosis". Freud (1894) argued that "anxious expectation" represented the central symptom of anxiety neurosis which remained a major organising principle in describing anxiety disorders until the development of DSM-IV (1994) when reference to it become viewed as an unproven etiological assumption (Rickels and Rynn, 2001).

Research investigating worry has it's roots in two separate fields: sleep disorders and test anxiety (e.g. Blankstein, Flett, Walson & Koledin, 1990). Both areas have investigated the effects of uncontrollable, negative and repetitive cognition upon behaviour and performance. A number of definitions of worry are presented in the literature. Borkovec, et al. (1983) captured the dynamic nature of worry in both normal and patient populations when they defined worry as:

> "A chain of thoughts and images, negatively affect laden and relatively uncontrollable; it represents an attempt to engage in mental problem solving on an issue whose outcome is uncertain but contains the possibility of one or more negative outcomes: consequently worry relates closely to fear processes" (p.10)

Similarly MacLeod ,Williams & BeKerian (1991) describe worry as:

> "A cognitive phenomenon concerned with future events where there is an uncertainty about the outcome, the future being thought about is a negative one and this is accompanied by a feeling of anxiety" (p.478)

Wells (1999) viewed worry as a form of coping and has presented a revised definition:

> "Worry is a chain of catastrophising thoughts that are predominantly verbal. It consists of the contemplation of potentially dangerous situations and of personal coping strategies. It is intrusive and controllable, although it is often experienced as uncontrollable. Worrying is associated with a motivation to prevent or avoid potential danger. Worrying may itself be viewed as a coping strategy but can become the focus of an individuals concern". (p.87).

With regard to classificatory systems of emotional disorder, the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV, APA, 1994) defines Generalized Anxiety Disorder as excessive anxiety and worry, about a number of events, that are difficult to control. The criteria also specify that three of the following six symptoms should also be present: restlessness or mental tension; fatigue; poor concentration; irritability; muscle tension; and, sleep disturbance. The duration of the symptoms should be of six months or more and the symptoms need to cause either significant distress and/or disruption to occupational and social functioning. Researchers have tended to use the GAD criteria of DSM-IV (1994) over another classificatory system

(ICD-10, WHO, 1990) which describes the equivalent emotional disorder in slightly different terms (Rickels & Rynn, 2001).

1.2.2 The origins of worry

There are a number of different developmental theories explaining how excessive worry may arise as a trait psychological problem. One pathway through which worry may develop is early experience associated with a lack of control and prediction over negative outcomes. Some support for this theory comes from research where GAD-analogue participants (i.e. participants who report excessive or problematic worry but who do not meet diagnostic criteria for GAD) have reported a history of trauma involving assault, illness, injury or death more frequently than non-anxious controls (Molina, Roemer, Borkovec & Posa, 1992). However, Aitkin & Craske (2001) argue that the theory that early negative life events generate vulnerability to GAD overlooks the possibility that GAD tendencies may have preceded the traumatic events, and acted as a moderator of the impact of the trauma experience. Furthermore, they suggest that presence of trauma-related experience is elevated in other anxiety disorders, hence the contribution of a history of trauma is not limited to GAD.

Another pathway through which worry has been hypothesized to originate is via early insecure attachment style (Bowlby, 1973). For example, Roemer, Borkovec, Posa & Lyonfields (1991) found that GAD-analogue participants reported greater feelings of enmeshment and role reversal (i.e. the need to protect and fear of losing the primary caregiver), and, anger and oscillating feelings toward the primary care-giver. They also felt significantly more rejected as children by the primary care giver than did

non-GAD controls. Borkovec (1994) suggests that early insecure attachments may provide the basis for the centrality of social evaluative concerns characteristic of chronic worry. A closely related pathway through which worry has also been hypothesised to originate is through parental over-protection, whereby care givers who are excessively involved in reducing negative consequences for their child may limit that child's ability to cope independently (Parker, 1983). Evidence supporting this hypothesis has shown that patients with GAD report greater experience of an overprotective parenting style in comparison to non-anxious controls (Silove, Parker, Hadzi-Pavlovic et al., 1991)

1.2.3 Characteristics of worry

Research investigating worry has found several features that discriminate normal worry from pathological (i.e. excessive and uncontrollable) worry associated with GAD (DSM-IV, APA, 1994). Craske, Rapee, Jackel & Barlow (1989) found that the content of worry in people with GAD does not appear to be different from the content of worry in non-anxious controls, nor were there differences in terms of the level of anxiety or aversiveness associated with worry. However, GAD patients reported a greater proportion of worries about illness, health and injury compared to normal controls who reported a higher proportion of financial worries. Eysenck and Vanderkum (1992) in a study evaluating the content of worry found that socio-evalautive concerns (e.g. personal fulfillment, relationships) and physical health were the two main factors accounting for the content of participants worry. However people with GAD also report spending greater amounts of time worrying, more worry topics, more unrealistic worries and more uncontrollable worries (Craske, Rapee,

Jackel & Barlow, 1989; Pruzinsky & Borkovec, 1990; Tallis, Davey & Capuzzo, 1994).

Research findings also suggest several functional differences between normal and pathological worry. Worry is characterised by internal verbal-linguistic activity rather than imagery. Borkovec & Inz (1990) found that non-anxious participants reported positive imagery whilst relaxing in contrast to GAD participants who reported equal amounts of (verbal) thoughts and images both of which were negative in tone. When instructed to worry both groups experienced a shift to greater rate of negative verbal thoughts than images. Furthermore, following psychological intervention GAD patients showed a normalisation in the frequency of verbal and imaginal thoughts (Borkovec & Inz, 1990). In contrast anxiety symptoms have been found to correlate positively with images and negatively with verbal thoughts among people with pathological worry (Freeston, Dugas & Ladouceur, 1996). In support of this notion participants instructed to worry following exposure to a stressful film experienced more intrusive thoughts about the film than participants instructed to produce images in response to the film (Butler, Wells & Dewick, 1995; Wells & Papageorgiou, 1995). This is consistent with previous findings that (verbal) thoughts about emotional information elicits little cardiovascular response (Vrana, Cuthbert & Lang, 1986).

Wells & Morrison, (1994) investigated the nature of worry in a study where participants kept a diary of content and qualities of everyday episodes of worry. They found that worry was experienced as verbal rather than imaginal, was highly distressing, and longer in duration than episodes of obsessive thinking. Participants also reported a number of attentional features of worry. They reported that keeping a

perceived threat in focus required cognitive rehearsal, that worry itself was intrusive, and distracting, and that episodes of worry are often proceeded by a feeling of a compulsion to act.

1.2.4 Theories of the function of worry

A number of models of worry have been proposed in the literature which view worry as: avoidance of fear (Borkovec, Shadick and Hopkins, 1991); thwarted problem solving (Davey, 1994); alarm, prompt and prepare (Tallis and Eyesenck, 1994); and, intolerance of uncertainty (Dugas, Gagnon, Ladouceur & Freeston, 1998). This review will briefly outline these models of pathological worry before focussing in more detail on the meta-cognitive model of worry (Wells 1995,1997).

Borkovec and colleagues (Borkovec and Inz, 1990; Borkovec, 1994; Borkovec, Ray & Stober, 1998) hypothesise that worry serves as a cognitive avoidance function in that worry is primarily verbal activity used to anticipate and avoid future threat. As threat is detected worrying reduces the generation of visual imagery that would normally cause activation of the sympathetic nervous system. Hence, worrying is maintained because it is negatively reinforced by reducing unpleasant physiological reactions to threat perception. The mechanism by which worry prevents emotional processing remains unclear since demonstrations of the physiological component of the model have been difficult to achieve (Davis & Montgomery, 1997). Furthermore there is some evidence that both visual and verbal tasks can interfere with worrying (Rapee, 1993; Ritchie, 1996). There may be other factors that may reinforce worry for

example the non-occurrence of events that were worried about and an individual's beliefs about the function of their worry (Wells, 1995).

Davey (1994) proposed that worry can have both adaptive and maladaptive qualities. When an individual is facing a problematic situation, worrying involves information seeking and problem-focused coping strategies, which may be adaptive in dealing with problems. However with the onset of anxiety, catastrophic possible outcomes are generated from memory and low confidence in problem solving skills decreases the ability to rule out many of these negative options thus contributing to the maintenance of worry. (Davey, Hampton, Farrell & Davidson, 1992; Davey 1994). This model may have over elaborated the role of low confidence in problem solving. Recent research has demonstrated that beliefs about meta-cognitive efficiency are less strongly associated with pathological worry than beliefs about the uncontrollability and danger of worry (Cartwright-Hatton & Wells, 1997; Wells & Papageorgiou, 1998).

Tallis & Eysenck (1994) proposed a three-stage model of worry. The first stage is characterised by threat appraisal. They argue that worry is likely to happen when important goals are threatened, when threat or the subjective appraisal of it is imminent. Worry occurs when coping resources do not match the demands of the situation. The second stage of the process involves the response to threat appraisal. Tallis and Eysenck (1994) argue that worry has three functions: alarm, prompt and preparation. Alarm informs the individual of threat, if unprocessed it will re-present the threat into awareness prompting the individual to prepare to respond (i.e. cope). Chronic worry occurs when alarms and prompts are activated too frequently. With an

attentional style that is constantly engaged in threat perception, worriers' cognitive system is constantly being prompted which also raises arousal levels. Stage three of the model concerns itself with the maintenance of worry. Tallis & Eyesenck (1994) propose that the frequent prompting and alarming of the system activates the awareness of negative possible outcomes, which activates negative mood. In addition worriers have deficits in problem solving which means that they are unable to disengage from unsolvable problems, and problems with decision making due to elevated evidence requirements. Given it's structure, this stage model fails to take account of the dynamic, reflexive and interactive nature of cognitive processing as proposed in more recent theories such as the Self-Regulatory Executive model (Matthews & Wells, 1994) or Interacting Cognitive Sub-systems model (Teasdale et al., 1999).

Another model of pathological worry features "intolerance of uncertainty" as its key process variable (Dugas, Gagnon, Ladouceur & Freeston, 1998). The model is concerned with how individuals appraise information in uncertain or ambiguous situations. Dugas et al., (1998) argue that because of the uncertainty of the situation initial "what if...?" questions are amplified, sometimes in the absence of the stimulus itself. Once the questions are activated, positive beliefs about worrying are activated (e.g. "worrying helps avoid disappointment", "worrying helps stop bad things happening") which reinforce the questioning. Dugas et al., (1998) argue that poor problem orientation (e.g. Davey & Tallis, 1994) and cognitive avoidance (e.g. Borkovec et al, 1983) contribute further to the maintenance of worry. Recent evidence suggests that both positive and negative beliefs about worry are implicated in the maintenance of pathological worry (Wells, 2000).

Wells (1995,1997) has proposed a model of worry that stresses the role of meta-cognition in the maintenance of chronic pathological worry. Meta-cognition is defined as knowledge or cognitive process that are implicated in the appraisal, monitoring and control of cognitive activity (Flavell, 1979). Most cognitive activities are dependent upon factors that monitor and control them, and are typically experienced as feelings. For example, "the tip of the tongue" experience, when an individual experiences a strong subjective sense of knowing that an item is stored in memory but is unable to retrieve it, is a common meta-cognitive experience. Clinical research into meta-cognition has arisen out of recent developments in cognitive psychology (Flavell, 1979; Metcalfe & Shimamura, 1994) and limitations of schema theory (Wells, 2000). Brown, Branford, Campione & Ferrara, (1983) made a discrimination between two features of meta-cognition: meta-cognitive knowledge and meta-cognitive regulation. Meta-cognitive knowledge refers to beliefs and information an individual holds about their own cognitive abilities and activities (e.g. " I have a poor memory"), whereas meta-cognitive regulation refers to executive functions (e.g. attention, monitoring, planning). From investigations into meta-cognitive aspects of worry Wells (1995) refers to these categories as explicit and implicit meta-cognitive knowledge. Explicit meta-cognitive knowledge is declarative and conscious, whilst implicit meta-cognitive knowledge refers to rules or plans that guide processing (e.g. attention allocation, memory search) that are not declarative and usually not conscious. Wells (1995) refers also to two other meta-cognitive processes: meta-cognitive experiences and meta-cognitive control strategies. Meta-cognitive experiences which include appraisals of the meanings of cognition, meta-cognitive feelings (e.g. tip of the tongue experiences) and judgements of the status of cognition. Meta-cognitive control strategies represent cognitive responses made to control cognitive activity. These

strategies may intensify or suppress thinking strategies or may be directed at enhancing monitoring processes.

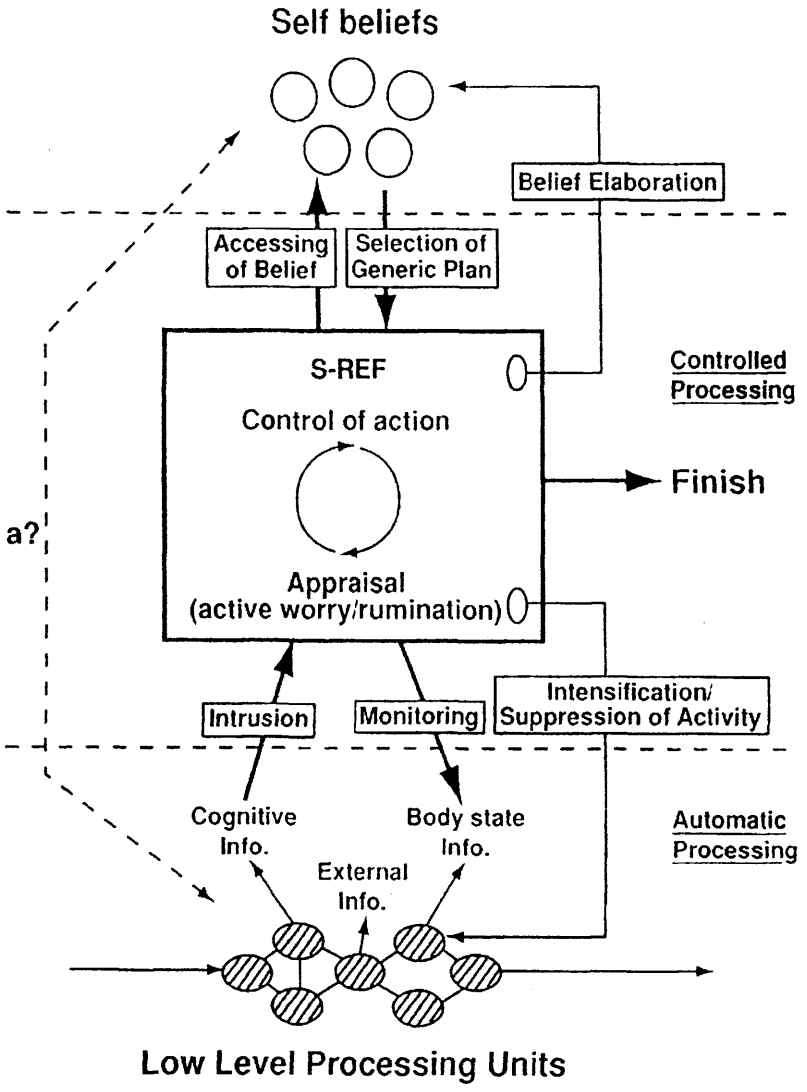
The construct that links an individuals central concerns and motivations to attention and information is coping. Matthews & Wells, (2000) suggest that individuals do not suffer distress passively in that they attempt to manage the demands placed upon them via different coping strategies (e.g. Lazurus & Folkman, 1984, Endler & Parker, 1990). Matthew & Wells (2000) argue that the choice of coping strategy influences the deployment of attention. For example when people choose to cope through emotion-focused strategies, such as worrying, attention is withdrawn from external stimuli and diverted toward internal thoughts. Worry can be adaptive in that it can prepare an individual to cope with subsequent problems. However it has the general effect of reducing the availability of attentional resources for other activities so that the worrier is cognitively impaired (Matthews & Wells, 2000). Research from information processing paradigms has demonstrated the impact of worry in terms of reducing attentional resources. For example worry in people with GAD has been hypothesized to be associated with an increased sensitivity to threat-related external cues (i.e. attentional bias), negative interpretations of ambiguous stimuli, facilitated activation of threat-related memory and deficits in problems solving (Matthews & MacLeod, 1985; Matthews & MacLeod, 1986MacLeod, Matthews & Tat, 1986; Mogg, Matthews & Weinman, 1989; Mogg, Mathews & Eyesenck, 1992). These deficits in information processing are hypothesized to result from and maintain worry.

1.2.5 The Self-Regulatory Executive Function (S-REF) model of psychopathology

In an attempt to understand the contribution of worry-related information processing deficits and its role within psychopathology Wells and Matthews (1994, 1996) have proposed a model that also integrates schema theory (e.g. Beck, 1976) which they have called the Self-Regulatory Executive Function (S-REF) model of psychological disorder. The model represents the reciprocal causal interplay between multiple components of cognition, meta-cognition, on-line processing and self-regulation (Wells, 2000). Figure 1 over page shows a schematic representation of the S-REF model.

The S-REF model is based on the interaction of three levels of cognition. Wells & Matthews (1994) propose that automatic low-level processing of external and internal stimuli is largely outside conscious awareness but can break into it. Controlled processing is dependent on attentional resources, and is involved with the conscious appraisal of events as well as the control of action and thought. Controlled processing is also largely dependent on accessing self-knowledge or beliefs from memory for its execution. These three levels represent the processing operations available to an individual but different modes and configurations can be executed. When processing occurs in object mode (Nelson & Narens, 1990), which is the default mode of the system, thoughts are taken as unevaluated and accurate representations of events. In contrast, the meta-cognitive mode refers to processing where thoughts themselves can be evaluated as events. Configuration refers to the pattern of cognitive processes activated at a particular time.

Figure 1) Schematic representation of the S-REF model of emotional disorder.



(Source: P.268, Wells & Matthews, 1994).

Wells & Matthews (1994) argue that at the core of the of the processing system is the S-REF itself, which is initiated when the individual perceives that important goals have not been met or may be not met. The S-REF then operates to reconcile the discrepancy between goals and the reality of the situation. Under normal circumstances periods of S-REF activity are short. For example, when the sensation of

hunger intrudes into awareness, the S-REF accesses self-knowledge that guides both the appraisal of such a sensation and the execution of strategies to return the individual to a normal state of satiety (Wells, 2000). The S-REF thus focuses attention on the self, appraising the significance of external and internal stimuli, usually in the object mode, so that thoughts and appraisals are accepted as accurate. Under typical conditions, S-REF activity is short in duration in that a person is able to select a coping strategy that deals with the discrepancy between desired and actual state, hence the self-regulatory nature of the system.

Wells & Matthews (1994) propose that in individuals vulnerable to distress the person fails to achieve the self-regulatory goal (i.e. minimize the discrepancy between desired vs. actual state) and the S-REF configuration becomes perseverative. Failure to achieve goals can be linked to the selection of maladaptive coping strategies: suppression of unwanted intrusions, rumination or worry directed at preventing more distressing stimuli entering consciousness and monitoring of threat both externally and internally. Strategy selection will be based on self-knowledge. Wells and Matthews (1994) argue that self-beliefs as well as being stored as declarative knowledge, as proposed in schema theory (e.g. Beck, 1976), may also be stored as general plans for processing and coping. Self-beliefs that give rise to recurrent cognition may be plans for guiding attention, information search, memory retrieval, appraisal as well as behaviour. Hence, meta-cognitive knowledge also contributes to emotional disorder. Meta-cognitive knowledge consists of both implicit plans that guide processing and usually operate out of conscious awareness, as well as explicit beliefs about thinking. In effect meta-cognitive knowledge represents beliefs about beliefs. It is hypothesized that meta-cognitive knowledge is linked to processing plans

that are central to the maintenance of emotional disorder since when the S-REF is in a perseverative state the effect is to lower the individuals threshold for identification of threat-related information in the automatic system. Furthermore because the S-REF system is a voluntary process the plans it initiates use up attentional resources which prevent the individual from incorporating new disconfirmatory information into the knowledge base.

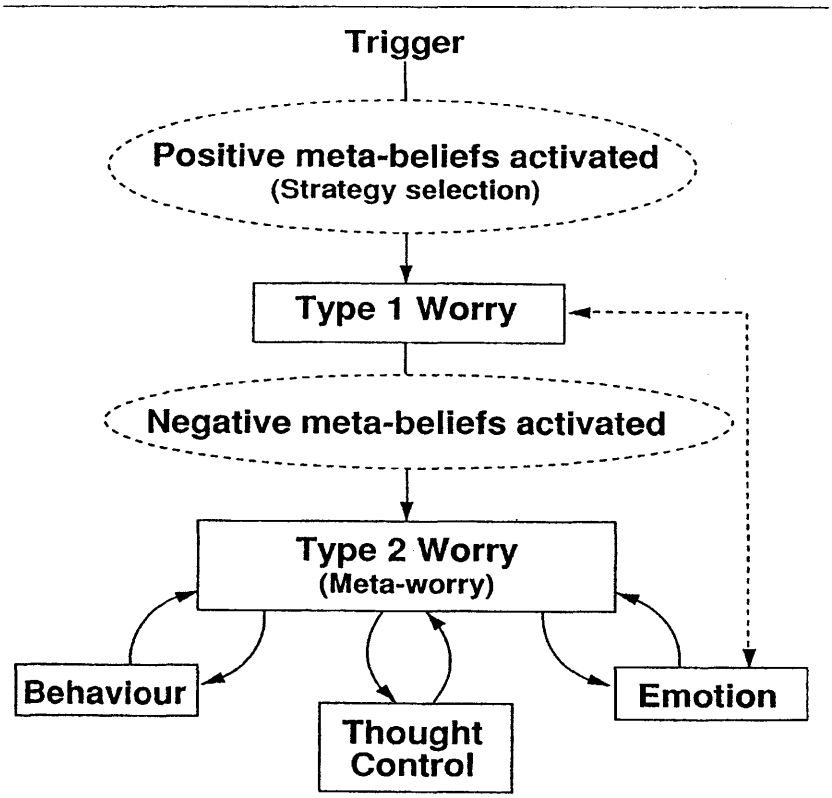
1.2.6 The meta-cognitive model of worry

Derived from the S-REF model, Wells (1995,1997) has developed a psychological model of worry that focuses on the form and appraisal of worry rather than the purely content of the worry. A schematic representation of the model is presented in Figure 2 overpage.

In terms of the form of worry, the model distinguishes between two types of worry. Type 1 worry concerns external daily events (e.g. the welfare of a partner) and internal non-cognitive events (e.g. physical symptoms). Type 2 worry is focused on the nature and occurrence of the thoughts themselves – in effect worry about worry. The model proposes that the content of worry between patients with Generalised Anxiety Disorder (GAD) and normal controls is similar, however abnormal kinds of worry such as that found in GAD are associated with a higher incidence of Type 2 worry. These negative appraisals of worry reflect negative meta-cognitive beliefs about worry (e.g. 'my worrying is uncontrollable', 'my worries will take over and control me'). In addition, the model proposes that people hold tacit positive beliefs about worry which serve to function as a coping strategy (e.g. 'worrying helps me

cope', 'if I worry I can prevent bad things happening to me'). However the use of worry as a coping strategy increases sensitivity to threat-related information and generates an elaborated range of possible negative outcomes capable of sustaining worry in it's own right.

Figure 2) Schematic representation of the meta-cognitive model of worry



(Source: P. 204, Wells, 1997).

Wells (1995) proposes that once Type 2 worrying is established three sets of processes contribute to maintain chronic worry. First, subtle behaviours such as avoidance of stimuli that trigger worrying, re-assurance seeking to attempt to end worry episodes and the use of distraction to prevent or displace worry, all reduce the

opportunities available to disconfirm Type 2 worry and negative beliefs about worry. Second, at a cognitive level the use of thought control strategies are likely to be unsuccessful thus reinforcing beliefs about the uncontrollability of worry. Since people with GAD hold both positive and negative beliefs about worry, worry may be practiced to exploit the advantages of worrying whilst at the same time controlling for the dangers. Hence worry may become a controlled rumination strategy which serves to generate and rehearse coping strategies. Attempts to suppress worry may also occur, motivated by negative beliefs about the consequences of worrying. However, the disadvantage of suppressing thoughts is that they may paradoxically increase the occurrence of unwanted thoughts (Wegner, Schneider, Carter & White, 1987) which may in turn increase worry triggers and thereby strengthen negative beliefs about the uncontrollability of worry. Thought control may also serve to inhibit more distressing thoughts, which may lead to a failure to emotionally process (Borkovec & Inz, 1990) which in turn strengthens meta-worry and negative beliefs. Third, in terms of emotional response Wells (1995) proposes that when Type 1 worry is activated autonomic arousal increases but decreases if the goals of worrying are met. When Type 2 worry is activated anxiety increases, which may be interpreted as evidence supporting negative beliefs about the uncontrollability and dangers of worry. Furthermore anxiety symptoms interfere with the individual reaching an internal state that that normally signals that it is all right to discontinue Type 1 worry.

To summarise, Wells (1995,1997) proposes that excessive, uncontrollable and generalised worry is maintained by the influence of positive and negative beliefs about worrying. Worrying represents a coping strategy to deal with anticipated threat, which in the short term may be associated with increasing anxiety symptoms.

However in the longer term a decrease in anxiety occurs as the goals of worrying are met which negatively reinforces the use of worry as a coping strategy. When negative beliefs about worry become activated, worrying becomes appraised as dangerous with an associated increase in anxiety symptoms and the potential for resolving worry concerns is diminished. Worrying thus develops its' own problems and is appraised as uncontrollable and dangerous.

1.2.7 Research evidence for the meta-cognitive model of worry

Evidence supporting the model comes from a number of studies involving patients with GAD, GAD analogues and patients with other anxiety disorders. The research has examined the role of meta-cognitive beliefs about worry in pathological worry, the role of meta-worry, and the cognitive consequences of worrying. A summary of this research is outlined below.

First, the model proposes that excessive worry is maintained by both positive and negative beliefs about worry (Wells, 1995,1997). To investigate the role of these beliefs in the maintenance of pathological worry Cartwright-Hatton and Wells (1997) developed the Meta-Cognitions Questionnaire (MCQ). The MCQ has five subscales which are: i) positive beliefs about worry (e.g. 'worrying helps me cope'); ii) negative beliefs about the uncontrollability and danger of worrying (e.g. 'when I start worrying I cannot stop', 'worrying is dangerous for me'); iii) meta-cognitive efficiency (e.g. 'I have a poor memory'); iv) general negative beliefs about worry, including themes of punishment, superstition and responsibility (e.g. 'not being able to control my thoughts is a sign of weakness'); and, v) cognitive self consciousness (e.g. 'I pay

close attention to the way my mind works'). The authors demonstrated that all five sub-scales were significantly and positively correlated to the Penn State Worry Questionnaire (PSWQ, Meyer, Miller, Metzer & Borkovec, 1990) a measure of worry proneness, and the trait anxiety sub-scale of the State-Trait Anxiety Inventory (STAI-T, Spielberger, Gorsuch, Lushene, Vagg & Jacobs, 1983). Overall negative beliefs about the uncontrollability and danger (MCQ-Ud) showed the strongest correlations with both trait measures. Multiple regression analysis revealed that worry proneness (PSWQ) remained positively associated with trait anxiety (STAI-T), positive beliefs about worry (MCQ-Pb), negative beliefs about the uncontrollability and danger of worry (MCQ-Ud), and lack of cognitive confidence (MCQ-Mce) when trait-anxiety and all the MCQ sub-scales were entered into the equation. Further examination of the MCQ was conducted with patients with GAD, obsessive compulsive disorder (OCD), patients with anxiety and depressive symptoms, and normal controls (Cartwright-Hatton & Wells, 1997). No significant differences were found between these groups in terms of positive beliefs about worry (MCQ-Pb). However GAD and OCD patients scored significantly higher on the beliefs about the uncontrollability and danger of worry (MCQ-Ud) than the other groups and scored significantly higher on the negative beliefs in general including themes of superstition, punishment and responsibility (MCQ-Spr) than normal controls.

Wells and Papageorgiou (1998) investigated the meta-cognitive predictors of pathological worry and obsessive-compulsive symptoms whilst controlling for the statistical interdependency of these variables. They found that trait worry, measured by the PSWQ (Meyer et al., 1990) and obsessive compulsive symptoms were significantly positively correlated with all the sub-scales of the MCQ. Further analysis

using multiple regression in which the overlap between pathological worry and obsessive-compulsive symptoms were controlled demonstrated that the MCQ positive beliefs about worry (MCQ-Pb) and the negative beliefs about worry including themes of danger and uncontrollability (MCQ-Ud), predicted pathological worry. Of these two sub-scales of the MCQ the beliefs about the uncontrollability and danger of worry (MCQ-Ud) made the greatest contribution.

Wells (2000) concluded that the results of these studies show that meta-cognitive beliefs about worry, particularly the uncontrollability and danger of worry, are positively associated with trait anxiety and proneness to worry.

In another study investigating metacognitive beliefs about worry, Bouman and Meijer (1999) explored whether patients with hypochondriasis were more concerned about their illness-related worries than they were about worrying in general. Measures included the PSWQ (Meyer et al., 1990), the Whitley Index (Pilowsky, 1967) a measure of hypochondriasis, and the MCQ (Cartwright-Hatton & Wells, 1997), and an instrument specifically developed for the study, the Meta-cognitive Questionnaire about Health Anxiety (MQHA, Bouman & Meijer, 1999). The authors reported significant positive correlations between the trait worry (PSWQ) and positive beliefs about worry (MCQ-Pb), beliefs about the uncontrollability and danger of worry (MCQ-Ud) and negative beliefs concerning superstition, punishment and responsibility (MCQ-Spr). They also found that the measure of hypochondriasis was significantly positively associated with both sub-scales of the MCQ concerned with negative beliefs about worry (i.e. MCQ-Ud and MCQ-Spr). Using multiple regression Bouman and Meijer (1999) found that negative beliefs about the uncontrollability,

interference of health anxiety worries (a sub-scale of the MQHA) and cognitive self-consciousness (MCQ-Csc) were significant predictors of hypochondriasis. However, these results need to be interpreted cautiously as the psychometric properties of the MQHA were not adequately reported (Wells, 2001). In spite of this limitation this study shows that meta-cognitive beliefs about worry appear to be implicated in hypochondriasis.

Davis & Valentier (2000) investigated further the contribution of meta-cognitive beliefs about worry to pathological worry. They investigated whether the MCQ contributed to state anxiety measured by the Beck Anxiety Inventory (BAI, Beck, Epstein, Brown & Steer, 1988) independently of trait worry (PSWQ, Meyer et al, 1990) and trait anxiety (STAI-T, Spielberger et al., 1989). They tested whether the MCQ factors could discriminate between normal and pathological worry using the Generalised Anxiety Disorder Questionnaire (GAD-Q, Roemer, Borkovec, Posa & Borkovec, 1995) over other related constructs such as trait worry or anxiety. Finally they investigated whether participants who met GAD criteria would exhibit higher levels of meta-worry than non-GAD controls. Using multiple regression they found that the meta-cognitive efficiency (MCQ-Mce) and trait anxiety (STAI-T) predicted state anxiety (BAI). To determine variables that would predict group membership the authors used discriminant function analysis (DFA) using the MCQ, STAI-T, BAI and PSWQ as predictor variables and group membership (i.e. GAD vs. non-worried anxious vs. non-anxious) as assessed by GAD-Q as the outcome variable. The results showed that negative beliefs about the uncontrollability and danger of worry (MCQ-Ud) and anxiety symptoms (BAI) discriminated between group membership. However these were the only two variables that met criteria for inclusion in the DFA

model. A MANOVA was used to test whether GAD participants exhibited higher levels of meta-worry (MCQ) compared to the other groups. The results showed that the GAD group scored significantly higher than the non-anxious group on all the MCQ sub-scales, and significantly higher than the nonworried-anxious group in terms of positive beliefs about worry (MCQ-Pb). The authors concluded that meta-cognitive confidence predicted anxiety symptoms when the contribution of trait worry and anxiety are controlled. Beliefs about the uncontrollability and danger worrying and state anxiety differentiated group membership, and participants meeting GAD criteria showed elevated meta-cognitive beleifs about worry as predicted by Wells model (1995). Limitations of this study in terms of external validity include the analogue sample.

A second feature of Well's (1995,1997) model proposes that Type 2 worry (i.e. meta-worry) is implicated in the maintenance of pathological worry associated with GAD. The model predicts that Type 2 worry should be positively correlated to pathological worry irrespective of the frequency of Type 1 worry. Preliminary studies using the Anxious Thoughts Inventory (AnTI; Wells, 1994) a three-factor instrument measuring social and health worry (i.e. Type 1 worry) and meta-worry (i.e. Type 2 worry) (Wells, 1994) supports this hypothesis.

In order to investigate the contribution of Type 2 worry to pathological worry, Wells & Carter (1999), tested whether meta-worry (i.e. Type 2 worry) was an independent and stronger predictor of pathological or problematic worry than health and social worry (i.e. Type 1 worry). Wells and Carter (1999) asked 140 non-patient subjects to complete the AnTI (Wells, 1994), the Penn State Worry Questionnaire (PSWQ,

Meyer at al., 1990), and the trait anxiety sub-scale of the State-Trait Anxiety Inventory (Spielberger et al., 1989). Participants were also asked to complete a visual analogue scale (VAS) rating of how much worry was a problem for the individual and a rating of it's controllability. The PSWQ and VAS of problem level were treated as dependent variables while the AnTI subscales, trait anxiety and VAS of controllability were entered as independent variables. Initial analysis revealed that all three independent variables were significantly and positively correlated to both pathological worry (i.e. PSWQ) and the VAS rating of problem level. The results of regression analysis revealed that when trait anxiety was controlled for, Type 2 worry predicted pathological worry when its covariance with type 1 was controlled, however Type 1 worry did not predict pathological worry in the same way. Hence consistent with Well's model (1995) Type 2 worry, rather than Type 1 worry was significantly associated with and predictive of pathological worry. Wells and Carter (1999) found similar results when problem level of worry was treated as the dependent variable in the multiple regression. They found that Type 2 worry and trait-anxiety, but not Type 1 worry, significantly predicted problem level. In further analysis where the rating of controllability of worry was controlled for, trait–anxiety and Type 2 worry remained a significant predictors of pathological worry. Finally when problem level was regressed on trait-anxiety, controllability, pathological worry and Type 1 and 2 worry, only meta-worry and PSWQ made independent contributions to problem level. Wells and Carter (1999) concluded that these findings supported the hypothesis that pathological and problematical worry were directly associated with Type 2 (i.e. meta-worry) rather than type 1 worry, even when trait-anxiety and controllability were statistically controlled. Although this study provides evidence for the role of meta-

worry in the maintenance of pathological worry, it is not clear whether findings would generalise to a clinical population given the analogue sample.

In a further test of the Wells' model, (1995), Wells and Carter (2001) investigated differences in meta-cognitive beliefs about worry (MCQ, Cartwright-Hatton & Wells, 1997) and meta-worry (AnTI, Wells 1994) between GAD patients, patients with social phobia, panic disorder and normal controls. There were 24 people in each group and patients met DSM-III-R (APA, 1987) criteria for the respective emotional disorders. In terms of scores on the MCQ, the authors found that GAD patients reported significantly higher negative beliefs concerning the uncontrollability and danger of worrying (i.e. MCQ-Ud) than the other groups, and significantly higher negative beliefs concerning superstition, punishment and responsibility (MCQ-Spr). However, there were no significant group differences in the endorsement of positive beliefs about worry (MCQ-Pb). With regard to the AnTI results, GAD patients also scored significantly higher than the other groups in terms of meta-worry (i.e. Type 2 worry). In terms of Type 1 worry, GAD patients obtained significantly higher social worry scores than panic patients and normal controls, but not social phobic patients, and GAD patients obtained significantly higher health worry scores than social phobics and controls, but not panic patients. These differences in the profile of the content of type 1 worry were predicted given the nature of the concerns central to panic and social phobics. Wells & Carter (2001) concluded that these results provide additional support for the role of negative meta-cognitive beliefs and type 2 worry in pathological worry.

Given that the elevated Type 1 worry scores within the GAD sample may be contributing to the variance in MCQ sub-scale scores further analysis was conducted to control for the contribution of Type 1 worry. The results showed that GAD patients retained significantly higher scores on the MCQ-Ud sub-scale compared to all the other groups and significantly higher scores in Type 2 worry compared to social phobics and normal controls but not panic patients. The effect for the MCQ-Spr sub-scale was not significant. The authors concluded that negative beliefs about the uncontrollability and danger of worry, and meta-worry are not a function of type 1 worry, but that the absence of MCQ-Spr differences suggest that it is dependent on Type 1 worry. By using Discriminant Function Analysis (DFA) Wells & Carter (2001) were able to identify the combinations of variables correlated to pathological worry that classify groups. Two discriminant functions were significant. The first function showed that what differentiated GAD patients from the other anxiety groups but not normal controls was the degree of Type 1 worry. That is the social phobic and panic groups were characterised by greater levels of contrasting health or social worry. The second function showed that GAD patients differed significantly from all the other groups in terms of meta-worry and negative beliefs about the uncontrollability and danger of worry. The authors concluded that panic and social phobic patients have specific Type 1 worry content and that high negative meta-cognition differentiates GAD patients from other patient and non-patient groups. Although this study used clinical populations and tests of difference rather than correlational analysis, external validity may be influenced by the use of DSM-III-R (APA, 1987) criteria for selection of GAD patients. DSM-IV (APA, 1994) introduced the uncontrollability of worry as a specific diagnostic criteria of GAD which may mean that the sample used in this study differ from a sample diagnosed with DSM-IV.

Finally the GAD model (Wells, 1995) proposes that the use of worrying as a coping strategy may create its own problems. In particular it has been shown that people with excessive worry use worry to distract themselves from more upsetting images (Borkovec & Inz, 1990) or as a means of coping with future threat (Wells, 1995). Two aspects of thought control are proposed to be relevant to the maintenance of GAD. First, it is argued that patients with GAD make few attempts to interrupt Type 1 worry once it is activated before reaching internal goals (i.e. not worrying is akin to not trying to cope). Second, attempts to suppress unwanted thoughts may trigger worry, reinforcing beliefs of lack of mental control since thought suppression can lead to the immediate or delayed increase in the incidence of target thoughts (Purdon, 1999)

The Thought Control Questionnaire (TCQ, Wells & Davies, 1994) was developed to measure individual differences in strategies for dealing with unwanted intrusions. Interviews involving a small number of patients with a range of anxiety disorders and non-patients generated items for the TCQ. The questionnaire was then factor analysed on student populations (Wells & Davies, 1994). The TCQ consists of 30 statements describing thought control strategies. There are six items in each of the five factors which are: reappraisal (e.g. 'I analyse the thought rationally', distraction (e.g. 'I keep myself busy', 'I think about something else'), punishment (e.g. 'I get angry at myself for having the thought') social control (e.g. 'I ask my friend if they have similar thoughts') and worry (e.g. 'I dwell on other worries').

Wells & Davies (1994) used the TCQ to explore whether thought control strategies were associated with other measures of emotional vulnerability. They found significant associations between the punishment (TCQ-P) and worry (TCQ-W) sub-

scales with trait worry (PSWQ, Meyer et al., 1990), intrusions associated with obsessive-compulsive disorder (Padua Inventory, Sanavio, 1988), trait anxiety (STAI-T, Spielberger et al., 1983), the social worry and meta-worry subscales of the Anxious Thoughts Inventory (AnTI, Wells, 1994), and neuroticism (Eyesenck Personality Inventory, Eyesenck & Eysenck, 1964). The other TCQ sub-scales of distraction, social control and re-appraisal showed non-significant but negative correlations with the emotional vulnerability measures. The overall pattern of results suggests that the worry and punishment sub-scales of the TCQ are significantly positively related to other measures of emotional vulnerability suggesting that these strategies to control unwanted thoughts are associated with proneness to emotional problems.

Reynolds & Wells (1999) investigated the relationships between thought control strategies and psychiatric symptoms in 124 patients who met criteria for major depression and post-traumatic stress disorder (PTSD) (DSM-IV, 1994). In terms of between group differences in thought control strategies, the PTSD group scored significantly higher on the distraction sub-scale (TCQ-D) than depressed participants. Within group correlations were performed to explore relationships between thought control strategies and the other symptom measures. Within the depressed group, depression symptoms, as measured by the Beck depression Inventory (BDI, Beck, Ward, Mendelssohn, Mock & Ebaugh, 1961), were significantly positively correlated with punishment (TCQ-P) and significantly negatively correlated with distraction (TCQ-D) and re-appraisal (TCQ-R). Anxiety symptoms, assessed using the Hospital Anxiety and Depression scale (HADs, Zigmond & Snaith, 1989) were significantly and positively associated with punishment (TCQ-P) and worry (TCQ-W) control strategies. The intrusion sub-scale of the Impact of Events Scale (IES, Horowitz ,

Wilner & Alvarez, 1979) significantly negatively correlated with reappraisal (TCQ-R) and positively associated with punishment (TCQ-P). Finally the avoidance sub-scale of the IES was significantly negatively correlated with social control (TCQ-Sc). For the PTSD group there was a significant negative correlation between the avoidance sub-scale of the IES and social control (TCQ-Sc). There were also significant negative correlations between the BDI and the anxiety sub-scale of the HADs with distraction (TCQ-D).

There was a prospective component to the study to investigate the impact of intervention on thought control strategies. Reynolds & wells (1999) found that improvement for both PTSD and depressed patients was associated with increased use of distraction (TCQ-D), re-appraisal (TCQ-R) and social control (TCQ-Sc) and a decrease in the use of punishment (TCQ-P) and worry (TCQ-W). Multiple regression analyses were run to explore the relationships between thought control strategies, and anxiety and depression whilst controlling for the overlap between these emotional states and between the TCQ sub-scales. The results showed that distraction (TCQ-D) emerged as a negative predictor of depression in both groups. Within the depressed group punishment (TCQ-P) was positively associated with depression whilst re-appraisal (TCQ-R) was negatively correlated with depression. Punishment and reappraisal also predicted intrusion in the depressed group but none of the TCQ sub-scales predicted intrusion in the PTSD group. Overall the authors concluded that worry and punishment appear to be thought control strategies that are elevated in psychopathology, predictive of emotional vulnerability and sensitive to treatment effects.

The above research has found that negative beliefs about worry, meta-worry and maladaptive thought control strategies are implicated in the maintenance of pathological worry in GAD (DSM-IV, 1994). One aim of this study is to explore whether these variables are associated with worry in people with a chronic, recurrent disease.

1.2.8 Worry and chronic health problems

Elevated levels of worry have been reported across populations with a number of different chronic diseases or conditions, for example: asthma (Sarafino, Gates & de Paulo, 2001); cancer (Baider & de-nour 1997; Dow & Lafferty, 2000); cardiac problems (Kubzansky, Kawachi, Spiro, Weis, Vokonas & Sparrow 1997); epilepsy (Markand, Salanova, Whelihan & Elmsley 2000); glaucoma (Janz, Wren, Lichter, Musch Gillespie & Guire, 2001); hypertension (Levenstein, Smith & Kaplan 2001); liver disease (Younassi, Guyatt, Kiwi, Bopari & King, 1999); pain (Aldrich, Eccleston & Crombez , 2000); psoriasis (Fortune et al., 2000); rheumatoid arthritis (Evers, Kraaimar, Geenan & Bijilsam 1998); and, sexually transmitted diseases (Sarna, van Servellen, Padilla & Brecht,1999). Worry has been reported to be a common problem for people experiencing chronic pain (Sofaer & Walker, 1994; Von Korff & Simon, 1996) particularly if they also are anxious about their health (Hadjistavropoulos, Hadjistavropoulos & Quine, 2000). However, few of these studies have used standardised measures of worry, and worry is largely defined in terms of worry about symptoms or consequences of the health problem.

Worry about symptoms has been shown to directly influence information seeking and health seeking behaviour. For example, women with breast cancer have been found to avoid cancer related information in order to avoid worry about cancer (Rees & Bath, 2001). In contrast, research has shown that women who worry about breast, ovarian and uterine cancer symptoms are more likely to seek surgical intervention particularly if they are at greater risk of developing cancer because of familial history (Stefanek, Helzlsouer Wilcox & Houn, 1995; Fry, Rush, Busby-Earle & Cull, 2001; Nevandunsky, Bachman & Nosher, 2001). Cancer related worry predicts interest in genetic testing for breast and ovarian cancer (Durfy, Bowen, McTiernan, Sporleder & Burke 1999). Consistent with these findings, it has been shown that women who have had surgery for ovarian cancer report less worry about symptoms post-operatively (Fry, Busby-Earle, Rush & Cull, 2001). However, despite high levels of worry in men with urinary tract symptoms (Girman, Epstein, Jacobsen, Guess, Panser et al., 1994) worry does not predict GP consultation in men who commonly experience these symptoms (Sladden, Hughes, Hirst & Ward, 2000).

Worry may also be linked to health outcomes. For example, worry and stress have been found to be psychological mediating triggers of asthma attacks (Sarafino, Gates & de Paulo, 2001). Research that has been reported indicates that chronic worrying may be one of a number of risk factors for myocardial infarction at 20 years follow-up (Kubzansky et al., 1997), and predicts poorer functional status in rheumatoid arthritis at 1 year follow-up (Evers et al, 1998). Fortune et al. (2000) reported high levels of pathological worry in a sample of psoriasis patients. They found that the beliefs that people hold about the consequences of their disease rather than clinical variables (e.g. severity of symptoms) predicted pathological worry in a sample of psoriasis patients.

However, the content and cognitive mechanisms contributing to the development of worry were not examined in this sample.

Aldrich, Eccleston And Crombez (2000) recently proposed a model of worry in chronic pain based on Tallis & Eyesenck's (1994) three-stage model. They suggest that chronic pain can be viewed as chronic vigilance to threat, which may lead to perseveration of attempts at solving the (insolubility) problem of attempting to escape from pain. Research has shown that if patients are worried by their pain they are more likely to be hypervigilant and more somatically aware which interferes with attention and amplifies somato-sensory information (Eccleston, Crombez, Aldrich & Stannard, 1997; Crombez, Eccleston, Baeyens & Elen, 1998). These findings highlight the role of attention in pain-related worry which may resemble the nature of attention described in the of the S-REF model of psychological disorder (Wells & Matthews, 1994) describe earlier.

Sharp (2001) has described a model of cognition in chronic pain that incorporates notions of meta-cognition and thought suppression. Sharp (2001) proposes that patients may interpret the presence of pain itself or pain-related thought as indicating something negative about their condition (e.g. "thinking about pain means my pain is serious", "It is horrible thinking about pain all the time...if I can't stop I'll go crazy"). which in turn will exacerbate pain-related worry. Support for this hypothesis comes from a descriptive study which used diaries to investigate pain related worry in chronic pain patients and normal controls (Eccleston, Crombez, Aldrich & Stannard, 2001). Eccleston et al. (2001) found that compared to the control groups' non-pain related worry, chronic pain worry was experienced as more difficult to dismiss, more

distracting, more attention grabbing, and more distressing. These characteristics were also found not to arise from a general disposition to worry nor from a general disposition for anxiety, but were associated with greater awareness of somatic symptoms. Sharp (2001) proposes that attempts to control these thoughts by suppression may lead to an increase in their frequency. No measures of meta-cognition or thought control were used in these studies, hence the contribution of meta-cognitive variables in relation to pain have yet to be clarified.

With regard to STDs and HIV, Sarna, van Servellen, Padilla & Brecht (1999) in a study of quality of life in sample of 44 women with HIV/AIDs found that worry about their families' well being and worry about the progression of the disease were variables associated with poorer quality of life. In a study of HIV related worry in a sample of HIV positive pregnant women, higher levels of worry were associated with women whose babies were also infected, those who had not disclosed their HIV status to others and those who reported that HIV infection was something about which their family would be ashamed. (Bennets, Shaffer, Manopaiboon et al., 1999). HIV related worry has also been shown to be one of a number of factors that predict emotional distress in HIV positive men (Vedhara & Nott, 1996).

Wingwood and Diclemete (1997) found in a sample of black-american women that participants with a history of childhood sexual abuse (CSA) were more likely to have a history of STDs, report riskier behaviours in terms of STD transmission, report more current physical abuse and worry more about HIV infection than, participants without a history of CSA. Misconceptions about HIV, multiple sexual partners and a history of STDs were associated with high worry about HIV in a sample of unmarried

heterosexuals (Dolcini, Catania, Choi, Fullilove & Coates, 1996). Crosby, DiClememte, Wingwood, Sionean Harrington Davies & Hook (2001) found in sample of black-amercian participants found that a recent history of STD infection was associated with more STD worry about infection of STD. Infrequent communication about sex and low perceived ability to negotiate condom use were correlated with STD worry. Greater worry about getting pregnant is associated with more frequent unprotected vaginal intercourse (Crosby, DiClemete, Wingwod, Sionean, Cobb & Harrington, 2000).

Despite finding of elevated worry in people with chronic health problems, much of the literature has focussed on worry about symptoms or consequences of the disease upon the individuals social functioning. According to Wells' model (1995) these themes would be construed as Type 1 worry, an adaptive strategy to cope with the health problem. Meta-cognitive aspects of pain-related worry have been proposed (Sharp, 2001) but as yet no research has examined whether Type 2 worry or other meta-cognitive dimensions of worry are implicated in the experience of people with chronic disease. This study is designed to investigate meta-cognitive dimension of worry in a chronic disease, recurrent genital herpes, that has been shown to be associated with elevated levels of psychopathology (Green & Koscis, 1997; Shah & Button, 1998).

1.3 Genital herpes

1.3.1 Clinical features of genital herpes

Genital herpes is a sexually transmitted infection (STI) that can be caused by two viruses, which are clinically much alike (Corey & Wald, 1999). Herpes simplex Virus-1 (HSV-1) usually associated with ulcers on non-genital areas (e.g. the mouth) commonly known as 'cold sores', and Herpes Simplex Virus-2 (HSV-2) which is usually associated with ulcers on the genital areas (e.g. penis, vagina and anus). Either HSV-1 or HSV-2 can cause genital infections due to cross-infection by oral sex (Corey & Wald, 1999).

Genital herpes is transmitted by direct contact of the virus on mucous membranes or breaks in the skin with visible and non-visible lesions, or asymptotically by people with no lesions through viral shedding. Viral shedding refers to viral particles of any quantity being transmitted down the nerve fiber to the skin which do not produce ulceration. Incubation of the virus usually lasts between three to eleven days following infection

A first episode of genital herpes usually presents with painful vesicles that rupture to produce ulcers usually situated on the genital skin and mucous membranes resulting in pain, itching, vaginal or urethral discharge. In women 80-90% of primary attacks affect both the vulva and cervix, fewer women present with single site infection (Adler, 1999). Following infection the virus becomes dormant in local sensory ganglia, periodically reactivating to cause symptomatic lesions or asymptomatic but

infectious viral shedding. Viral shedding occur more frequently in patients with genital HSV-2. Crusts or scabs then form on the ulcers, which usually heal within 12 to 20 days.

Infection may also be complicated by systemic symptoms such as fever, swollen glands and pain which varies according to the number and site of lesions. Serious consequences of the disease are rare but can include forms of meningitis, myelitis, arthritis, cervicitis, proctitis, urethral stricture, fusions of the labia and viremic spread of the virus to multiple organs in immuno-suppressed patients (Corey & Wald, 1999). Genital ulceration caused by the herpes virus has been shown to a risk factor for the sexual acquisition and transmission of Human Immuno-deficiency Virus (HIV) (Corey & Handsfield, 2000).In pregnant women the disease has also been associated with spontaneous abortion, fetal malformations, neonate mental retardation and mortality.

Despite individual differences in the severity of symptoms, approximately 80-90% of people with HSV-2 infection experience between four to 35 recurrences per year, with a mean duration of eight days (Haemal, 1981; Luby and Klinge, 1981). The recurrences are usually less severe and shorter in duration than the first episode (Corey & Wald, 1999). The cause of the recurrence is unknown, although they are not due to re-infection. People with HSV-2 tend to suffer recurrences earlier after the first episode and more frequently than than people with HSV-1. The median recurrence rate after symptomatic first episode is .34 recurrences per month for HSV-2 and .08 recurrences per month for HSV-1 (Barton, Brown, Cowan, Jeffries, Kinghorn et al., 1999). Recurrence rates decline over time in most individuals although this pattern is

variable (Wald et al, 2000). Genital herpes recurrences are self limiting and generally cause minor symptoms (Barton et al ,1999).

Patients with both primary and recurrent attacks may be asymptomatic, unaware that they have the infection, or sub-clinical symptoms. Previous studies have suggested that the prevalence of sub-clinical HSV-2 infection in patients attending GUM clinics is high (Scoular & Kinghorn, 1999). Partner notification may be an effective way of detecting individuals with unrecognised clinical disease since asymptomatic viral shredding plays a major role in the transmission of HSV. For example, Mertz et al (1985) found that 60% of partners of people with diagnosed HSV infection were unaware that they had symptoms consistent with a previous history of HSV infection or were experiencing a first episode.

1.3.2 Epidemiology of genital herpes

Genital herpes is one of the most common STDs worldwide. It is one of the three most prevalent STDs in the US and it's prevalence rates in the developing world are estimated to be high (Corey and Handsfield, 2000). A recent Department of Health (2001) document reported that almost all STDs are becoming more common, and that the number of visits to departments of GUM in England has doubled over the last 10 years.

Between 1972 and 1999 the number of diagnoses of genital herpes made at GUM clinics in England, Wales and Scotland rose 4 and 14 times in males and females respectively (Vyse, Gray, Slomka, Gopal & Gibbs, 2000). This has been reflected in

the changing female to male ratio, from 0.4 :1 in 1972 to 1.4:1 in 1999. Between 1990 and 1999 the number of diagnoses of first episodes of genital herpes in females rose from 29 to 43 per 100,000 population. The figure for first episode genital herpes in males remained fairly stable at around 23 per 100,000 during the same period. In terms of age, rates in 1999 were highest in the 20 to 24 year old age group for both males and females (79 per 100,000 population and 181 per 100,00 respectively) (CDR, 2001). Within the past 20 years an increasing proportion of genital herpes cases has been caused by HSV-1, especially among young women. This may be the result of changes in sexual behaviour towards an increase in oral-genital sexual contact (Lafferty, Coombs, Benedetti et al., 1997).

1.3.3 Diagnosis and treatment of genital herpes

Research has shown that only about 20% of patients who present to physicians with symptoms receive a correct diagnosis of genital herpes (Benedetti, Corey & Ahfield, 1994).Virus culture and typing are the gold standard detection methods but antigen detection can be useful for samples taken late in an outbreak (Barton et al, 1999). Despite the widespread availability of virus typing in GUM clinics, it is not routinely communicated to patients even though clinic attenders would like know if they were infected with HSV-2 (Scoular & Kinghorn, 1999). From a prevention point of view asymptomatic transmission is more likely to occur in people with HSV-2 hence Scoular & Kinghorn (1999) argue for increased awareness of HSV-2 among partners with the aim of inhibiting further transmission. Testing for the presence of HSV-2 has showed no negative psychological consequences (Smith, Denham Keogh, Jacobs, McHaig et al., 2000; Wilkinson, Barton Chard & Meadows, 2000).

Following diagnosis, counseling is routinely offered to people with first episode genital herpes to discuss possible sources of infection, treatment options, risk of transmission including sub-clinical viral shedding, risk of transmission during pregnancy and the possibility of partner notification (Barton et al., 1999). Safer sex practices, including limiting sexual partners, disclosing to sexual partners the presence of the disease and the use of condoms and spermicides, containing nonoxynol-9, are recommended for preventing HSV transmission (Barton et al., 1999).

Treatment is palliative as currently no cure is available (Barton et al., 1999). Patients presenting with first episode genital herpes within 5 days of the beginning of the episode or while new lesions are forming are given oral anti-viral drugs (i.e. aciclovir, valacicliv and famciclovir). Supportive measures to ameliorate symptoms include saline bathing and analgesia for pain relief (Barton et al., 1999). Management for recurrent episodes includes further application of supportive measures, episodic antiviral drugs that can reduce the duration and severity of symptoms, and suppressive therapy. Patients presenting with recurrent episodes who experience a recurrence rate of six or more episodes per annum may benefit from suppressive anti-viral therapy (i.e. lower doses of anti-virals over longer periods of time). Controlled studies have demonstrated the marked reduction in genital herpes recurrence frequency with continuous aciclovir and valaciclovir therapy (Goldberg, Kaufman, Kurtz et al., 1993; Wagstaff, Faulds & Goa, 1994; Patel, Bodsworth, Wooley et al, 1997; Reitano, Tyring Lang et al., 1998). One fifth of patients will experience a reduction in recurrence frequency compared with pre-suppression symptomatic levels (Barton et al 1999). Uncontrolled trials have also found an association between suppressive therapy

and improvements in psychological well-being (Carney, Ross, Ikkos & Mindel, 1993).

1.3.4 Quality of life in genital herpes.

There has been little research assessing the impact of genital herpes on non-clinical aspects of patients' lives. Recently a model of quality of life (QoL) has been described that postulates that life gains its quality from the ability and capacity of the individual to satisfy his/her needs (Hunt & McKenna, 1992). Functions are seen as important only insofar as they provide the means by which these needs can be fulfilled. It is taken as axiomatic that QoL is high when needs are met and low when needs are not met. QoL is viewed as a distinct construct separate from function and health status, it is a reflection of the way patients perceive and react to their health status and to other non-medical aspects of their lives (McKenna & Doward, 1995).

Based on the needs-model of QoL Doward, McKenna, Kohlmann et al. (1998) developed the Recurrent Genital Herpes QoL (RGHQoL) instrument to assess the impact of RGH on non-clinical aspects of patient's lives. Items were generated from interviews with people with RGH and reflect their concerns (Doward et al, 1998). For example, items include statements such as 'It is difficult to forget that I have herpes', 'Herpes affects my self confidence', and 'I worry about getting into stressful situations', and in this respect may resemble Type 1 worry (Wells, 1995). The psychometric properties of the RGH have also been investigated in six countries (Doward et al, 1998).

Spencer, Leplege & Ecosse (1999) found that participants who reported having felt psychologically disturbed by their last attack, those that reported that their sex lives had been disrupted and those who had difficulty informing their partner had significantly poorer QoL than respondents who did not report these problems. QoL was found to be lowest in participants under 25 years of age.

Patel, Tyring, Strand, Price & Grant (1999) in a recent multi-centre randomized controlled study found significant improvements in quality of life scores for five different active treatment groups (i.e. different dosages of aciclovir or valaciclovir) compared to a placebo control group at baseline measurement and at 3 and 6 month follow-up. The results indicate that participants receiving suppressive anti-viral therapy reported improved and sustained quality of life scores.

1.3.5 Psychopathology associated with genital herpes

Much research has been conducted investigating the psychological impact of having genital herpes. In their review of the literature, Shah and Button (1998) reported research that has demonstrated that people with genital herpes may experience a number of psychological sequelae following diagnosis, including low self-esteem (Drob, Loemen & Lifschutz, 1985; Luby & Klinge, 1985; Lynch, 1988; Vanderplate & Aral, 1987), guilt and shame (Bierman, 1985), interpersonal difficulties (Drob et al., 1985), and depression (Derman, 1986; Levenson, Hamer, Myers, Hart, & Kaplowitz, 1987; Longo, Clum & Yaeger 1988). In a recent study Dibble and Swanson (1999) found that 16% of their sample of young adults with genital herpes scored as clinically depressed on the Beck Depression Inventory (Beck and Steer,

1987). The study showed that anger and a negative attitude towards genital herpes were predictive of depression in this sample. Shah and Button (1998) also state that the most common reactions to diagnosis are sexual dysfunction (Lynch 1988; Shaw & Rosenfield, 1987) and generalised anxiety (Derman, 1986, Lynch, 1988). Both Derman (1986) and Lynch (1988) describe high levels of anxiety in their studies however their reports are largely based on anecdotal evidence and predate recent definitions of worry (e.g. GAD, DSM-IV, 1994).

Shah and Button (1998) state that as yet there is no clear model of HSV recurrence in humans. Zorilla, Mackay, Luborsky and Schidt (1996) used meta-analytic techniques to review the relationship between stressors and depressive symptoms and HSV recurrence. They analysed 16 studies, 12 of which focused on genital herpes. They concluded that depressive symptoms rather than stressors increase the risk of recurrence.

Shah & Button (1998) argue that studies examining the psychological factors associated with genital herpes recurrence fall into three study types: retrospective, prospective and intervention studies. Shah and Button (1998) describe a number of studies whereby participants retrospectively attribute the cause of their recurrence to stress. However they suggest that the nature of the retrospective studies means that data is associative rather than causal, that it remains unclear whether psychological processes precede outbreaks and that self report of previous events is subject to memory bias. Findings from prospective studies, which typically involve participants keeping HSV symptom and stress diaries as well as psychometric assessments of mood, are mixed. Shah and Button (1998) suggest that it is difficult to identify the

direction of the relationship between psychological factors and HSV recurrence. One study reported that patients who had frequent severe recurrences were more likely to view their lives as less under their control, to engage in more wishful thinking and to be less likely to control their own thinking about the problem (Silver, Auerbach, Vishniavsky & Kaplowitz , 1986).

In a recent prospective study Cohen, Kemeny, Kearney, Zegans, Neuhaaus & Conant (1999) investigated the relationship between stress and HSV recurrences in a community sample of 58 women over a 6 month period. Stress was measured using a weekly diary of stressful events and monthly assessments of life changing events. Weekly stressors were defined as lasting no longer than seven days, whereas persistent stressors were defined as lasting longer than a week. Hence examples of weekly stressors reported in the study included flying on an aeroplane (3 hours) and a car being vandalised (1 day). Examples of persistent stressors cited within the study included persistent worry about a participant's pregnant sister (3 weeks), uncertainty about on the security of a participant's job (4 weeks) and financial problems (7 weeks). Negative mood was assessed on a weekly basis using a modified version of the Mood Questionnaire (Ryman, Biersner & LaRocco, 1974), a state measure with three sub-scales measuring depression, anger and anxiety. The short form of the Taylor Manifest Anxiety Scale (Bendig,1956) was used to measure trait anxiety and the Life Orientation Test (Scheier & Carver, 1985) was used to assess optimism. Two other instruments were used to assess general medical symptoms and HSV recurrence. Using logistical regression Cohen et al. (1999) found that neither major life events nor short-term stress (less than 7 days) nor menstrual cycle symptoms predicted recurrence of HSV symptoms. Neither did increased levels of negative mood (i.e.

anger depression, anxiety) predict the timing of recurrence. However the authors did find that persistent stressors in the last six months were more likely to be followed by a recurrence. One moderately stressful experience lasting more than seven days would increase by 26% the chance of having a recurrence of HSV symptoms the following week. Hence the results also showed persistent but not short-term stress predicted HSV recurrence.

Rein (2000) has questioned the validity of these results for two reasons. First, the study used an unrepresentative sample consisting entirely of women (age range of 20 to 44). Second participants were only included if they had visible herpes lesions which limits external validity since many people with HSV infection experience asymptomatic recurrences. Rein (2000) argues that stress may increase the frequency of asymptomatic recurrences and thereby increasing the risk of transmission without increasing symptomatic recurrences.

Although there is no causal evidence relating stress with HSV recurrence there are a number of studies that have shown that psychological interventions appear to have a positive effect in reducing outbreaks (Shah & Button, 1998). Generally, applied relaxation and psycho-educational interventions have been reported as beneficial. For example, Longo et al (1998) split participants into three groups: psychological intervention; social support and a waiting list control group. The psychological intervention group received six sessions of applied relaxation, HSV information and stress management techniques whilst the social support participants received sessions concerned with sharing feelings and experiences. The authors found that the

psychological intervention group reported a significant reduction in recurrence and an increase in social support.

In their review, Green & Koscis (1997) state that much research effort has gone into the possible link of HSV recurrence with stress and less into more clinically relevant areas. They speculate that from anecdotal evidence many patients report that stress leads to outbreaks of symptoms, that patients worry about this and that their worry puts them under more stress, which can lead to them feeling out of control or that they are in some way failing.

1.4 Summary of the literature & research aims

When an individual is faced with a situation that is uncontrollable and possibly threatening, such as having a chronic illness, the opportunities for worry to develop as a coping strategy are present (Wells, 2000). Worry about symptoms and the consequences of chronic health problems have been reported across a number of different health populations. Worry has been shown to effect health seeking behaviour, and may be a cognitive mediating factor in triggering symptoms for some health problems (Cohen et al., 1999)

The psychological consequences of having genital herpes are well documented (Green & Koscis, 1997; Shah & Button, 1998). Stress, moderate levels of anxiety and worry have been associated with outbreaks of RGH symptoms (Cohen et al., 1999). As Green & Koscis (1997) point commonly held belief about the role of stress in recurrence of symptoms, and worry about this may lead to patients feeling under more

strain and unable to control their disease which may contribute further to feelings of anxiety and stress.

Wells (1999) has defined worry as a coping strategy and has described a meta-cognitive model of worry in GAD (Wells, 1995) based upon the S-REF model of emotional disorder (Wells & Matthews, 1994). Research has demonstrated that emotional vulnerability is closely associated with meta-cognitive beliefs about worry, particularly, beliefs about the uncontrollability and danger of worry and meta-worry (Cartwright-Hatton & Wells, 1997; Wells & Papageorgiou, 1998; Bouman & Meijer, 1999; Wells & Carter, 1999). Research has also demonstrated that these variables also predict pathological worry, independently of trait anxiety (Cartwright-Hatton & Wells, 1997; Wells & Carter, 1999). Furthermore, maladaptive thought control strategies have also been shown to be associated with proneness to worry (Wells & Davies, 1994) and current psychological distress (Reynolds & Wells, 1999). Finally differences in meta-cognitive beliefs about worry have been demonstrated between GAD patients or analogues and those not experiencing pathological worry (Davis & Valentier, 2000; Wells & Carter, 2001)

The objectives of this study were three-fold. The first aim of this study was to explore relationships between the meta-cognitive variables implicated in pathological worry and measures of emotional vulnerability and distress, given that meta-worry, meta-cognitive beliefs about worry and maladaptive thought control strategies have been shown to be positively associated with measures of emotional vulnerability and distress in GAD & and GAD-analogue populations (Wells & Davies, 1994; Cartwright-Hatton & Wells, 1997; Wells & Papageorgiou, 1998; Wells & Carter

1999). Hence hypothesis one considers whether there is convergent evidence for Wells' (1995) model of GAD within a chronic disease population reported to have high levels of worry (Derman, 1986; Lynch, 1988; Cohen et al., 1999).

A second aim was to examine differences between participants with recurrent genital herpes (RGH) and a normal (healthy) control group in terms of emotional vulnerability and distress, meta-cognitive dimensions of worry and thought control strategies. Given elevated levels of distress reported in populations with RGH (Shah & Button, 1998) particularly anxiety (Derman, 1986) and worry (Cohen et al., 1999) hypothesis two predicted between group differences with regard to emotional vulnerability and distress.

Hypothesis three predicted that RGH participants would score higher in terms of health and social worry (i.e. type 1 worry) given the unpredictable nature of symptom outbreaks and the social stigma associated with having an STD. Wells' (1995) model of GAD predicts that once type 1 worry is established type 2 worry will be activated hence hypothesis three predicted that RGH participants would also score higher in terms of meta-worry (type 2 worry). Furthermore, previous research had found that meta-cognitive beliefs about worry, particularly negative beliefs about the uncontrollability and danger of worry and negative beliefs including themes of superstition, punishment and responsibility have been implicated in the maintenance of GAD (Cartwright-Hatton & Wells, 1997; Wells & Papageorgiou, 1998). Consistent with Wells' (1995) model of GAD where elevated levels of emotional vulnerability are associated with meta-worry and meta-cognitive beliefs about worry, hypothesis three also predicted between group differences in negative meta-cognitive beliefs

about worry. With regard to how individuals attempt to control their worry, previous research had shown that maladaptive thought control strategies (i.e. worry and punishment) were implicated in the maintenance of emotional disorder (Wells & Davies, 1994; Wells & Carter, 1999). Wells (1995) model describes the activation of maladaptive thought control strategies with the activation of negative beliefs about worry, hence given elevated scores in terms of type 2 worry hypothesis four predicted between group differences in terms of maladaptive thought control strategies. Cartwright-Hatton & Wells (1997) and Wells & Papageorgiou (1998) had previously demonstrated that positive beliefs about worry, negative beliefs about the uncontrollability and danger of worry and meta-cognitive efficiency were predictors of pathological worry when controlling for the contribution of trait anxiety. Where preliminary data analysis revealed significant between group differences in terms of meta-cognitive beliefs about worry, hypothesis five predicted that those differences would remain when trait anxiety was treated as a co-variate.

The final aim of the study was to explore the relationships between quality of life and emotional vulnerability and distress, meta-cognitive dimensions of worry, thought control strategies whilst controlling for the contribution of trait anxiety within the RGH group. This aim was determined by the theoretical implications of the S-REF model of emotional disorder (Wells & Matthews, 1994) which imply that psychological problems arise out the perseveration of the S-REF itself when goals are not being met. Similarly, the needs based model of QoL (Hunt & McKenna, 1992) suggests that QoL is low when needs are not being met. Interestingly, the RGHQoL instrument (Doward et al., 1998), based on Hunt & McKenna's (1992) model of QoL, has a number of items that ask respondents to rate their level of worry about aspects

of living with RGH, which would be considered akin to type 1 worry (Wells, 1995). Both models make similar predictions in that psychological distress and poor QoL are the outcome of an inability of an individual to met their goals and needs, and there is conceptual overlap in the central role of worry in this process. Hence hypothesis six considered the relationships between QoL and trait worry, state anxiety, type of worry and meta-cognitive variables implicated in pathological worry. Given the likelihood that there would be a high correlation between trait anxiety and poor QoL, and the previous finding that meta-cognitive beliefs about worry predict pathological worry independently of trait anxiety (Cartwright-Hatton & Wells, 1997; Wells & Papageorgiou, 1998), trait anxiety was partialed out of the correlation analysis.

1.5 Hypotheses

Hypothesis one. In order to explore the relationships between the variables proposed to be implicated in the maintenance of pathological worry (e.g. positive and negative beliefs about worry, meta-worry and thought control strategies) (Wells, 1995) correlations were performed between the variables across the entire data set. It is predicted that measures of emotional vulnerability will be positively correlated with meta-cognitive beliefs about worry, type 1 and 2 worry and maladaptive thought control strategies.

Hypothesis two. Hypothesis two considered between group differences in terms of emotional vulnerability. The RGH group will score significantly higher than the control group with regard to proneness to worry (i.e. PSWQ), trait anxiety (i.e. STAI-T) and state anxiety (i.e. STAI-S).

Hypothesis three. Hypothesis three considered the different aspects of meta-worry and meta-cognitive beliefs about worry, and was split into two parts. i) There will be significant between group differences in terms of the two types of worry (Wells, 1995). The RGH group will score significantly higher on measures assessing both type 1 (i.e. AnTI-S and AnTI-H) and type 2 worry (i.e. AnTI-M). ii) There will be significant between group differences in meta-cognitive beliefs about worry (i.e. MCQ). Specifically, it is predicted that the RGH group will score significantly higher on the beliefs about uncontrollability and danger of worry sub-scale (MCQ-Ud), and negative beliefs about thoughts including themes of superstition, punishment and responsibility sub-scale (MCQ-Spr).

Hypothesis four. Hypothesis four considered whether there were any between group differences in the strategies participants used to control unwanted or unpleasant thoughts.

There will be significant between group differences in strategies used to control unwanted or unpleasant thoughts (i.e. TCQ). Specifically, it is predicted that the RGH group will score significantly higher on the worry (TCQ-W) and punishment (TCQ-P) sub-scales.

Hypothesis five. Where preliminary data analysis had revealed significant differences between the RGH and control groups on the sub-scales of the MCQ hypothesis five considered whether differences would still be significant when controlling for trait anxiety. There will be significant differences between the RGH and control group on the meta-cognitive efficiency (MCQ-Mce) and negative beliefs about thoughts

including themes of superstition punishment and responsibility (MCQ-Spr) sub-scales, independent of the contribution of trait anxiety (i.e. STAI-T).

Hypothesis six. In order to explore the association of emotional distress, and the different aspects of worry and thought control within the RGH group controlling for trait anxiety Kendall T partial correlations were performed between all the measures within the RGH group. It is predicted that measures of emotional vulnerability, meta-cognitive beliefs about worry, type 1 and 2 worry and maladaptive thought control strategies will be negatively correlated with quality of life, independently of trait anxiety.

2.0 METHOD.

The introduction section presented the background literature and aims of this study. In this section a brief overview of the research methods will be described.

2.1 Design.

A postal survey, comprising of a self-completion questionnaire, was considered the most economical distribution and recruitment method given the potential geographical dispersion of participants. Therefore a between-subjects survey design was adopted in order to investigate the aims of the study.

2.2 Participants.

A large sample was determined, via power analysis, in order for the intended data analysis to be conducted. To test for differences between the groups the sample size required was calculated to be n=786 (i.e. 393 participants in each group) for a small effect size (d=0.2), when alpha = .05 and power = .80 (p.158, Table 2, Cohen, 1992).

Participants were to be recruited from three independent sources: the Department of Genito-Urinary Medicine (GUM) at the Leicester Royal Infirmary; the Department of GUM at the Royal Hallamshire Hospital, Sheffield; and, The Herpes Viruses Association (HVA). The HVA is an independent sector support organisation, with a nation-wide membership, for people living with herpes simplex virus.

The total number of participants recruited was 92, 10 fulfilled one or more of the exclusion criteria (see below) hence these cases were removed from the data set. Thus the entire sample consisted of 82 participants: 41 participants with recurrent genital herpes and 41 healthy controls.

2.2.1 RGH participants

In order to sample people with recurrent genital herpes, the following inclusion criteria were applied: Primary diagnosis of genital herpes as defined by a GUM Consultant, attending for treatment at GUM or membership of HVA, and English as first language. The following exclusion criteria were applied to the RGH group: Below age 18 years; people with diagnosis of Learning Disability, and presence of a second chronic illness, disease or STI.

The total number of respondents with RGH was 48. The majority of RGH participants (n=31, 65%) were recruited from an advertisement in the March 2001 edition of SPHERE, the quarterly journal of the Herpes Virus Association. SPHERE has a circulation of 986. Responses to the advert resulted in 55 requests for the questionnaire, 35 questionnaires were returned which represents a response rate of 64%.

The hospital samples were recruited from two Departments of Genito-Urinary Medicine (GUM), the Leicester Royal Infirmary (LRI) and the Royal Hallamshire Hospital (RHH), Sheffield. In total, 30 patients attended GUM at the LRI for treatment of recurrent genital herpes (RGH) between February and May 2001, and 71 patients attended GUM at the RHH (Sheffield) for treatment of RGH between April

and May 2001. Of the 30 LRI patients who were invited to participate in the research by their health advisor or treating consultant, 8 patients requested a questionnaire, and only three returned their completed questionnaires, which represents a response rate of 10%. Of the 71 RHH (Sheffield) patients who were approached, 30 patients requested a questionnaire, and 10 returned their completed questionnaires, which represents a response rate of 33%. It is known that four of the LRI sample, and nine of the RHH sample refused to participate in the study for the following reasons: 'don't want to' (n=3), 'haven't got time', 'can't be bothered' (n=6), 'too much pain' and 'too many questions (n=2)'.

Initial data analysis revealed that 7 (i.e. four of the HVA sample and three of the combined GUM sample) of the 48 RGH participants did not meet the criteria for inclusion in the study. Two people reported having Asthma, two had irritable bowel syndrome, one person had genital warts, one had Type II Diabetes, and, one had a spinal disc prolapse. These cases were not included in any further data analysis hence the final RGH sample size was 41.

2.2.2 Control group

In order to sample the control group the following exclusion criteria were applied: Aged below 18 years; diagnosis of a learning disability; and, the presence of a chronic illness, disease or sexually transmitted disease (STD). Controls also had to have English as their first language.

A control group (n=45) of healthy volunteers was recruited as a convenience sample from staff at a local general hospital. Potential participants were approached by the researcher in person and invited to participate in the study. Of the 84 people approached, with a letter of invitation, to participate in the study 60 requested a questionnaire, and 45 questionnaires were returned which represents a 75% response rate.

Initial data analysis revealed that 4 of the 45 normal controls did not meet the criteria for inclusion in the study: two people reported having asthma; one had ulcerative colitis; and, one had chronic back pain. These cases were not included in any further data analysis hence the control group sample size was 41.

2.2.3 Demographic characteristics of the sample

The mean age for the entire sample was 37.5 (SD= 9.2) years, and the range was 18 to 64 years. Table 1 (overpage) indicates that there was no significant difference between the two groups in terms of age. The mean age ($\underline{M}$ = 38.9, SD= 9.0, Range = 18- 64 years) of the RGH participants (n= 40) was not significantly different (U= -1.6, p>.05) than the mean age ($\underline{M}$= 35.8, SD= 8.8, Range = 23-57 years) of the control group (n =41).

Table 1). Mean and standard deviation (SD) scores of age (years) for RGH and control groups.

Group	N	Mean (S.D.)	Range	U*	*p*
RGH	40	38.9 (9.0)	18 – 64	-1.6	NS
Control	41	35.8 (8.8)	23 – 57		

Note: U* = Mann Whitney U

Table 2 (overpage) indicates that the majority of participants were white, female, heterosexual and employed (full or part time). In considering the demographic characteristics for the RGH group: 30 (73%) were female; 22 (54%) were single; and, 40 (98%) were heterosexual, one participant identified as bi-sexual. Most RGH participants had obtained vocational qualifications (n=11, 27%) or a degree (n=10, 24%), and 37 (93%) were in employment. The majority of RGH participants were white (n=38, 93%), whilst one person identified as Asian (Pakistani) and two as Black (Caribbean).

Of the control group, 28 (68%) were female, 32 (78%) were married or co-habiting, and 40 (98%) identified as heterosexual, whilst one person identified as a lesbian. A large proportion of the control group (n=18, 44%) were university graduates and 39 (95%) were in employment. All 41 (100%) of the control group identified as white.

Table 2). Frequencies and percentages (%) of demographic categories for RGH and control groups

	RGH		Control				
Demographic variable	**n**	**(%)**	**N**	**(%)**	χ^2	**df**	***p***
Gender							
Male	11	(27)	13	(32)	.24	1	NS
Female	30	(73)	28	(68)			
Relationship status							
Single	22	(54)	9	(22)	8.8	1	< .01
Married/Co-habiting	19	(46)	32	(78)			
Sexual orientation*							
Heterosexual	40	(98)	40	(98)			
Lesbian	0	-	1	(2)			
Bi-sexual	1	(2)	0	-			
Ethnic identity*							
White	38	(93)	41	(100)			
Asian – Pakistani	1	(2)	-	-			
Black – Caribbean	2	(5)	-	-			
Employment status*							
Employed (Full/Part time)	37	(93)	39	95			
Not employed	3	(7)	2	5			
Educational level							
Left school at 16	5	(12)	4	(10)			
CSE/O/GCSE	7	(17)	6	(14)			
A/HNC/HND	4	(10)	5	(12)	5.6	5	NS
Vocational qualification	11	(27)	4	(10)			
Graduate	10	(24)	18	(44)			
Post-graduate	4	(10)	4	(10)			

Note: *Statistical comparisons invalid as expected frequencies < 5

Table 2 shows that significantly more of the control group were married or cohabiting compared to the RGH group (chi sq. = 8.8, df = 1, p<.01). There were no significant differences between the groups in terms of gender or educational level. No other comparisons were possible, as the frequencies of scores did not meet the criteria for appropriate analysis.

2.2.4 Health related characteristics of the sample

Of the RGH group all 41 (100%) reported having been given a herpes diagnosis. The mean time since diagnosis was 7.2 (SD=5.1) years, and the mode was 15.0 years (Range = 1 to 16.4 years). In terms of symptom frequency, the mean number of outbreaks that RGH participants experienced over the last twelve months was 7.8 (SD = 7.7), and the mode was 3.0 (Range = 0 – 40.0). With regard to duration of symptoms, RGH participants reported that that the mean length of a typical outbreak was 6.3 days (SD = 2.5), and the mode was 5.0 days (Range 3 – 14 days). Finally RGH participants were asked to rate the severity of symptoms of a typical outbreak on a 6 point scale (i.e. 0 = No symptoms and 5 = severe symptoms). The mean severity of symptom rating was 3.1 (SD = 1.0), the mode was 3.0 and the range was 1.0 to 5.0.

With regard to health related characteristics of the control group, participants were asked to report how many times they had had an appointment with their GP in the last twelve months. Just under half of the control group (n=20, 49%) had been to their GP between 1 and 4 times; 15 (37%) stated that they had not visited their at all; 5 (12%) had been 5 to 9 times; and, one person had been to see their GP 10 or more times. The majority of the control group (n=27, 66%) had not received any medical care at hospital (either as an inpatient or outpatient) in the last twelve months. The remaining 14 (34%) reported attending a hospital for acute medical problems, investigations or minor injuries (e.g. minor surgery, sprained ankle, broken bone, kidney' investigation, and X-ray). None of the control group reported having had any STDs over the last twelve months.

2.3 Procedure.

Both the Leicestershire Health Authority's Research and Ethics Committee and the South Sheffield Research and Ethics Committee approved the current study (see Appendix 16).

Prior to data collection a small pilot study of RGH participants (n=3) was conducted to assess the amount of time needed to complete the questionnaire. The results revealed that the time taken to complete of the questionnaires ranged from between 15 to 20 minutes. Participants in the pilot study also expressed a preference for a postal survey as opposed to an interview as the survey could be completed at their own convenience, obviating the need to attend an interview appointment

Participants were recruited via two GUM clinics within the Trent regional health authority. People with a culture positive diagnosis of HSV attending the GUM clinic, Leicester Royal Infirmary, between February and May 2001, for treatment of recurrent outbreaks of genital herpes were invited to participate in the study. In addition people attending for treatment at the GUM clinic Royal Hallamshire Hospital, Sheffield between April and May 2001 were invited to participate. In both clinics the treating consultant or health advisor approached people with RGH with a letter of invitation to participate in the study (Appendix 1), an information sheet about the study (Appendix 2) and a consent form (Appendix 3). Once consent had been received by the consultant or health advisor, the participant was either issued a questionnaire at a follow-up appointment, or, with their permission, sent a questionnaire with a stamped addressed envelope for its return.

The sample recruited via the HVA were invited to participate through an advert placed in the March 2001 edition of 'SPHERE' the quarterly journal of the HVA (See Appendix 4). The advert invited people with RGH, interested in participating in the study, to telephone or email the researcher, in confidence, to request a questionnaire. Questionnaires were then sent to participants in an envelope marked 'Private & Confidential' with an information sheet (Appendix 5), consent from (Appendix 6) and stamped addressed envelope for the return of the questionnaire.

There were differences between the RGH and control groups in terms of content of items and measures included in the questionnaires. The differences between the questionnaires were two-fold. First, a quality of life instrument (i.e. RGHQoL, Doward & McKenna, 1998) was included in the questionnaire for RGH participants. This measure was of interest to this study as not only as a quality of life instrument but also because it listed a number of items that people with RGH have commonly reported worrying about (e.g. 'I worry about getting into stressful situations', 'I worry about giving herpes to someone'). In relation to Wells' (1995) model of generalised anxiety disorder, these statements would be equivalent to type 1 worry, proneness to health or social worry. Second, different items were included in the 'About your health' parts of the demographic sections of both questionnaires (see Appendices 7 and 8). The demographic section of the RGH questionnaire (see Appendix 7) included items, which required participants to confirm whether they had been given a diagnosis of genital herpes, and report the time since diagnosis. In addition, RGH participants were asked to indicate how many outbreaks of genital herpes they had experienced in the last year, how long their outbreaks usually lasted (i.e. days), and rate the severity of their symptoms. In contrast, the demographic section of the control group

questionnaire (see Appendix 8) asked participants to indicate how many times they had visited their GP, and specify whether they had received any medical care at a hospital, either as an inpatient or outpatient, in the last 12 months. Both questionnaires included items that sought to ask participants about whether they had any sexually transmitted infections, other than herpes in the case of RGH group, and report the presence of any long-standing physical health problems or disability.

For each questionnaire the order of presentation of the different measures was randomised to reduce demand characteristics. This technique has been used by other postal survey designs (e.g. Freeston et al., 1996; Davies & Valentier, 2000).

2.4 Measures

2.4.1 Confidentiality

Confidentiality was ensured throughout the study. RGH participants were recruited either via contact with a medical professional involved in their routine treatment or through the SPHERE journal. Both mechanisms avoided direct contact by the researcher thereby reducing the need for personal identification and disclosure. In terms of confidentiality of the data, code numbers were allocated to each returned questionnaires and consent forms, both of which were held separately and securely by the researcher. Copies of consent forms from participants sampled at the GUM clinics were included in the participants' medical notes in line with recommendations from the ethics committee. Relevant demographic and standardised data was extracted and reproduced without personal identifying information.

2.4.2 Self-completion questionnaires

The self-completion questionnaires included a demographic sections in two parts entitled 'About You' and 'About your health' covering general demographic information and information about health (Appendix 7 and 8). These sections were followed by the standardised questionnaires measuring state and trait anxiety, trait worry, meta-cognitive dimensions of worry, and thought control strategies as described below.

2.4.3 Standardised measures

2.4.3.1 Penn State Worry Questionnaire – PSWQ (Meyer, Miller, Metzger, & Borkovec, 1990)

The PSWQ is a 16-item questionnaire devised to measure trait worry as shown in Appendix 9. The items comprise general statements about worry (e.g. 'Many situations make me worry', and 'I have been a worrier all my life'). Respondents were asked to rate how typical these statements were in relation to themselves on a five point scale (i.e. 1 = 'Not at all typical of me' to 5 = 'Very typical of me'). Items 1,3,8,10 and 11 are reversed scored to reduce demand characteristics.

The PSWQ was selected because it has been shown to discriminate between groups who met the DSM-III-R (APA, 1987) criteria for Generalised Anxiety Disorder (GAD) (Meyer et al., 1990) and it has robust psychometric properties. Alpha reliability coefficient scores range from .91 to .95 with undergraduate and GAD

samples. Test re-test scores were .92 over 10 weeks with undergraduate samples. Construct validity has been demonstrated with appropriate correlations with other measures of worry (Meyer et al., 1990).

2.4.3.2 Meta-Cognitions Questionnaire – MCQ (Cartwright-Hatton & Wells, 1997)

The MCQ, as shown in Appendix 10, is a questionnaire devised to assess individual differences in positive and negative beliefs about worry and intrusive thoughts, metacognitive monitoring and attitudes about cognitive efficiency. The theoretical basis of the questionnaire is derived from Wells' (1994, 1997) cognitive model of GAD.

The MCQ consists of five sub-scales assessed by 65 items in total. The five sub-scales are as follows: 1) Positive beliefs about worrying (e.g. 'worrying helps me cope'); 2) negative beliefs about worry focussing on uncontrollability and danger (e.g. 'when I start worrying I cannot stop'); 3) cognitive confidence (e.g. 'I have a poor memory'); 4) negative beliefs about worry, including themes of superstition, punishment, responsibility and need for control (e.g. 'not being able to control my worry is a sign of weakness', and; 5) cognitive self-consciousness (e.g. 'I pay close attention to the way my minds works'). Respondents were asked to rate how much they generally agreed with the items in the questionnaire on a four point scale (i.e. 1 = 'Do not agree') to 4 = 'Agree very much'). Items 20, 41 and 44 of the MCQ were reversed scored.

The items in the MCQ were derived from interviews with undergraduates as well as samples of transcripts of cognitive therapy taken from sessions for interventions of GAD, OCD, panic disorder and hypochondriasis. In terms of its psychometric properties, alpha reliability coefficient scores for each of the sub-scales ranged from .72 to .89 (Cartwright-Hatton & Wells, 1997). Test re-test scores ranged from .76 to .89 over five weeks with post-graduate and university employee samples. Appropriate correlations with other measures have adequately demonstrated concurrent and construct validity (Cartwright-Hatton & Wells, 1997; Wells & Papageorgiou, 1999). Furthermore discriminant validity has been demonstrated with elevated scores on the MCQ across different patient populations where worry and intrusive thinking are central to the maintenance of the emotional disorder (e.g. controls vs. GAD, OCD, panic disorder, social phobia and major depression) (Cartwright-Hatton & Wells, 1997; Wells & Carter, 2000). The MCQ was chosen over the Meta-Cognition about Health Anxiety questionnaire (MCHA, Bouman & Meijer, 1999) as the latter's psychometric properties have not been thoroughly investigated.

2.4.3.3 Anxious Thoughts Inventory – AnTI (Wells, 1994)

The AnTI (Appendix 11) is a 22 item self report instrument that comprises three sub-scales that measure proneness to social worry, health worry, and meta-worry. The health worry sub-scale (e.g. 'I worry about my physical health') and social worry sub-scale (e.g. 'I worry about making a fool of myself') are content measures and constitute type 1 worry (Wells, 1995). The meta-worry sub-scale is a measure of meta-cognitive appraisals of worry and process aspects of worry (e.g. 'I worry that I cannot control my thoughts as well as I would like to') which represents type 2 worry

(i.e. worry about worry). Respondents were asked to rate how often they experienced these worries on a four point scale (i.e. 1 = 'Almost never' to 4 = 'Almost always'). Items for the AnTI were generated from interviews with people with panic disorder and GAD (Wells, 1994).

The AnTI has been demonstrated to have good psychometric properties. Alpha reliability coefficient scores for each of the three sub-scales ranged from .75 to .84 (Wells, 1994). Test re-test scores ranged from .76 to .84 over 6 weeks within an undergraduate sample. Appropriate correlations with the Spielberger trait anxiety sub-scale (STAI-T, Spielberger et al., 1983), Eysenck Personality Inventory (Eysenck & Eysenck, 1976) and the Self-Consciousness scale (Fenigstein, Scheir & Buss, 1975) have adequately demonstrated concurrent validity (Wells, 1994). Furthermore discriminant validity has been demonstrated with elevated scores on the AnTI across different patient populations where type 1 and type 2 worry are central to the maintenance of the emotional disorder (e.g. controls vs. GAD, OCD, panic disorder, social phobia and major depression) (Wells, 1994; Wells & Carter, 2000).

The AnTI was selected for the present study over the Worry Domains Questionnaire (WDQ, Tallis, Davey and Bond, 1994), another measure of the content of worrying thoughts, since despite having good psychometric properties the WDQ has no factors measuring meta-cognition.

2.4.3.4 Thought Control Questionnaire – TCQ (Wells & Davies, 1994)

The TCQ (Appendix 12) is a 30-item scale, with five subscales, and was devised to measure individual differences in the use of meta-cognitive strategies to control intrusive and distressing thoughts. The five subscales were: 1) Distraction (e.g. occupy myself with work instead'); 2) social control (e.g. 'I ask friends if they have similar thoughts); 3) worry (e.g. 'I focus on different negative thoughts'); 4) punishment (e.g. 'I shout at myself for having the thought'), and 5) re-appraisal (e.g. 'I try a different way of thinking about it'). Participants were asked to rate how often they used the listed control strategies to control unpleasant or unwanted thought on a four point scale (i.e. 1 = 'Never' to 4 = 'Almost always'). Items 5,8 and 12 from the social control sub-scale were reverse scored.

Items for the TCQ were generated from interviews with people with a range of anxiety disorders and non-patient controls. Good psychometric properties have been demonstrated with this instrument. Alpha reliabilities for the five subscales range from .64 to .79 (Wells & Davies, 1994). Test-retest reliability was also adequate ranging from .67 to .83 over six weeks with a non-patient sample. Concurrent validation of the TCQ was problematic since parallel measures of thought control were not available however the worry and punishment sub-scales of the TCQ were positively associated with measures assessing stress vulnerability, perceived lack of control over thinking and perceptions of diminished control over thinking (Wells & Davies, 1994). Reynolds & Wells, 1999 have shown that the TCQ subscales appear to be sensitive to recovery from depression and PTSD.

The TCQ was chosen as it was the only instrument to assess cognitive control strategies central to the S-REF model of affective disorders (Wells & Matthews, 1994).

2.4.3.5 State Trait Anxiety Inventory – STAI – Form Y (Spielberger,Gorsuch, Lushene, Vagg & Jacobs, 1983)

The STAI is a 40-item questionnaire with two subscales of 20 items that assess state and trait anxiety respectively (Appendix 13). The state anxiety (STAI-S) sub-scale measures the intensity of an emotional state of anxiety characterised by apprehension, tension nervousness, worry and autonomic arousal. It consists of twenty statements (e.g. 'I feel calm', 'I am jittery') that evaluate how respondents feel currently. Respondents rate the degree to which the statement applies to them on a four-point scale (i.e. 1 ='Not at all' to 4 =' Very much so'). Ten items were reversed scored to reduce demand characteristics.

The trait anxiety (STAI-T) sub-scale consists of 20 statements (e.g. 'I feel satisfied with myself', I am a steady person') . Respondents rated on a four-point scale (i.e. 1 = 'Almost never' to 4 = 'Almost always') how they generally feel about the statements. This sub-scale measures relatively stable individual differences in the tendency to perceive stressful situations as threatening or dangerous, that is anxiety proneness. Nine items were reverse scored. Both subscales are scored by summing the individual items and can range from 20 to 80.

The STAI was chosen for this research to provide information on state and trait anxiety in the sample, and because it has good psychometric properties (Speilberger et al., 1983). Alpha co-efficient range from .86 to .95 and from .89 to .91 for the state and trait subscales respectively. Test-retest reliability coefficients range from .73 to .84 for the trait sub-scale, and from .16 to .54 for the state sub-scale, over 15 weeks, on a student sample. Relatively low co-efficients were observed for state anxiety as scores reflect variability in the unique factors that may contribute to transitory anxiety states (Spielberger et al., 1983). Validity has been adequately demonstrated with correlations of trait sub-scale with other trait anxiety measures, comparisons of scores across clinical and non-clinical populations, correlation's of both STAI subscales with other measures of personality and adjustment, and investigations of the effects of the variability of stressors on state sub-scale scores (Spielberger et al., 1983)..

2.4.3.6 Recurrent Genital Herpes Quality of Life instrument – RGHQoL (Doward, McKenna, Kohlmann, Niero et al., 1998)

The RGHQoL (Appendix 14) is a 20-item scale devised to assess the impact of RGH on non-clinical aspects of patient's lives. Items within the scale were generated from interviews with people with RGH (Doward et al, 1998) and included statements such as 'It is difficult to forget that I have herpes', 'Herpes affects my self confidence', and 'I worry about getting into stressful situations'. Participants were instructed to read each statement and choose the response that indicated their level of agreement with the statement at present. For example, for the last item cited above the response format would range from 'Yes, I worry about this great deal' to 'I rarely or never think about it'. Responses to each item were scored on a four-point scale from 0 to 3.

A total score was the summation of the individual items. Thus scores can range from 0 to 60, with a high score indicating a good quality of life.

The RGHQoL was chosen for this study as it was derived from a needs-based theoretical model of QoL which stipulates that life gains its quality from the ability and capacity of the individual to satisfy their needs (Hunt & McKenna, 1992). It also possesses good psychometric properties having been trialed in six countries. Alpha coefficients ranging from .91 to .97 and high test-retest reliability was demonstrated with co-efficients ranging from .85 to .97 (Doward et al., 1998). Concurrent validity was demonstrated, on a German sample of people with RGH, with moderate associations, ranging from .19 to .55 with the factors within the German version of Nottingham Health Profile (NHP-G, Kohlmann, Bullinger & Kirchberger-Blumstein, 1997). No tests of discriminant validity were reported (Doward et al, 1998).

3.0 RESULTS

In this section statistical procedures used to examine whether the data met the appropriate criteria for statistical manipulation will be outlined. This will be followed by a description of the results of the data analysis.

3.1 Statistical procedures for analysis.

Prior to statistical analysis the data set was examined to determine the appropriateness of using parametric statistics. In order for parametric tests to be undertaken the level of measurement has to be interval or ratio, the distribution of scores within each sample have to be normal, and the variance of scores around the mean within each group have to be homogeneous (Howell, 1987).

Mean scores for all the standardised questionnaires, and age, were considered to be interval. The Shapiro-Wilk (SW) test was used to determine whether scores on the measures differed significantly from normal distribution. This statistic was used as it is considered more accurate than the Kolmogorov-Smirnov test and is more appropriate for small samples (i.e. $n < 50$) (Field, 2000; SPSS V.10 for Windows). The only scores that did not significantly differ from normal distribution were the Distraction, Re-appraisal, and Social control subscales of the TCQ, and the Trait sub-scale of the STAI.

In line with Tabachnick and Fidel's (1996) recommendations regarding transforming data to meet the normal distribution assumption, first outliers and extreme values

were treated as missing data and then the data was re-examined with the Shapiro-Wilk test. If this procedure failed to 'normalise' the data then all but the above mentioned subscales were transformed using commonly used equations for positively skewed data (i.e. Square root, Base logarithm 10 and Inverse). Transformations normalised all of the subscales of the MCQ, the PSWQ, the Punishment sub-scale of the TCQ and the Social sub-scale of the AnTI. Transformations failed to normalise the STAI State sub-scale, the Health and Meta worry sub-scales of the AnTI, and the worry sub-scale of the TCQ.

All scales that met the normality assumption were then subjected to Levene's test for homogeneity of variance. The PSWQ, the social worry sub-scale of the AnTI and the Beliefs about Controllability sub-scale of the MCQ failed this test. Demographic data described in the Method section earlier was largely categorical in nature was tested using the Chi-square statistic. The variable age was subject to Mann Whitney U statistic as it failed the Shapiro Wilk statistic.

For correlation analysis non-parametric tests were used given the differential in scales meeting parametric assumptions. The Kendall T correlation co-efficient was chosen over the Spearman correlation because it enabled a further level of analysis (i.e. the calculation of the Kendall T Partial correlation co-efficient) and is reported to be a more accurate estimate of the correlation in the population (Field, 2000).

For comparative analysis, where scales met the parametric assumptions Analysis of Variance (ANOVA) and Analysis of Co-variance (ANCOVA) tests were used. Where scales did not meet the parametric assumptions Mann Whitney U tests were used.

Significance levels were set using the Bonferronni procedure in order to protect against threats of making Type 1 errors (Howell, 1987). Thus for the STAI subscales alpha was set at $p < .03$, for the AnTI alpha was set at $p < .02$ and for the TCQ and MCQ alpha was set at $p < .01$. All calculations, except the Kendall T Partial coefficients, were performed on SPSS for Windows (Version 10) on a stand alone PC. The Kendall T Partial correlation co-efficients were conducted with the use of a calculator, pen and paper (Equation 9.13, p. 257, Siegel & Castellan, 1988).

3.2 Descriptive statistics

Means and standard deviations for the scores from the entire sample on the standardised measures used in this study are presented in Table 4 below.

Table 3. Mean and standard deviation (SD) scores of standardised measures for the entire sample

Measures	*n*	Mean	(SD)
PSWQ	*82*	45.1	(15.5)
STAI-T	*82*	40.1	(10.9)
STAI-S	*81*	35.2	(11.5)
AnTI-S	*82*	18.0	(6.5)
AnTI-H	*82*	9.9	(4.00)
AnTI-M	*80*	11.7	(4.3)
MCQ-Pb	*74*	29.1	(6.5)
MCQ-Ud	*81*	31.7	(10.7)
MCQ-Mce	*79*	16.6	(4.8)
MCQ-Spr	*75*	19.7	(4.3)
MCQ-Csc	*78*	16.7	(4.7)
TCQ-D	*75*	14.6	(2.9)
TCQ-P	*79*	9.0	(1.9)
TCQ-W	*81*	9.3	(3.0)
TCQ-R	*73*	13.9	(3.4)
TCQ-Sc	*80*	13.1	(4.5)
RGHQoL	*41*	31.7	(14.9)

Note: PSWQ=Penn State Worry Questionnaire; STAI-T=State Trait Anxiety Inventory- Trait; STAI-S=State Trait Anxiety Inventory- State; AnTI-S=Anxious Thoughts Inventory-Social worry; AnTI-H=Anxious Thoughts Inventory-Health worry; AnTI-M=Anxious Thoughts Inventory-Meta worry; MCQ-Pb=Meta-Cognitions Questionnaire-Positive beliefs; MCQ-Ud = Meta-Cognitions Questionnaire-Negative beliefs about uncontrollability and danger of worry; MCQ-Mce = Meta-Cognitions Questionnaire-Meta-cognitive efficiency; MCQ-Spr = Meta-Cognitions Questionnaire-Negative beliefs about thoughts including superstition, punishment and responsibility; MCQ-Csc = Meta-Cognitions Questionnaire-Cognitive self-consciousness; TCQ-D = Thought control Questionnaire-Distraction: TCQ-P= Thought Control Questionnaire-Punishment;TCQ-W=Thought Control Questionnaire-Worry; TCQ-R=Thought Control Questionnaire-Re-appraisal; TCQ-Sc=Thought Control Questionnaire-Social control, & RGHQoL = Recurrent Genital Herpes Quality of Life questionnaire.

3.3 Correlation analysis

3.3.1 Hypothesis one

In order to explore the relationships between the variables proposed to be implicated in the maintenance of pathological worry (e.g. positive and negative beliefs about worry, meta-worry and thought control strategies) (Wells, 1995) correlations were performed between the variables across the entire data set. It was predicted that the measures of emotional vulnerability would be positively associated with meta-cognitive beliefs about worry, Type 1 and 2 worry, and maladaptive thought control strategies.

The entire data set was subjected to non-parametric correlation's to examine the level of association between emotional distress, the different aspects of meta-cognitive dimensions of worry and thought control strategies. Table 4 (overpage) displays Kendall T correlation co-efficients for the entire sample.

The Bonferroni procedure calculated alpha at .0004 to protect against type errors. Since SPSS output only reports significance levels to three decimal places alpha was set at $p<.001$.

Table 4 shows that trait worry (PSWQ) correlated significantly with both trait anxiety (STAI-T) ($t=.62$, $p<.001$) and state anxiety (STAI-S) ($t=.59$, $p<.001$). Trait worry also correlated significantly with measures of the different types of worry. The PSWQ correlated significantly with social worry (AnTI-S) ($t=.50$, $p<.001$) and health worry

Table 4. Kendall T correlation co-efficients of standardised measures for the entire sample

Measures	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*
1. PSWQ	*(.95)*															
2. STAI-T	.62†	*(.95)*														
3. STAI-S	.59†	.66†	*(.94)*													
4. AnTI-S	.50†	.61†	.48†	*(.93)*												
5. AnTI-H	.30†	.33†	.31†	.26†	*(.91)*											
6. AnTI-M	.66†	.58†	.58†	.53†	.42†	*(.88)*										
7. MCQ-Pb	.25†	.18	.16	.30†	.16	.37†	*(.88)*									
8 MCQ-Ud	.51†	.45†	.49†	.37†	.29†	.53†	.23**	*(.93)*								
9.MCQ-Mce	.22**	.25**	.26†	.24**	.06	.24**	.14	.31†	*(.82)*							
10. MCQ-Spr	.32†	.36†	.29†	.39†	.20*	.43†	.33†	.50†	.29†	*(.79)*						
11. MCQ-Csc	.21**	.19*	.20*	.15	.09	.27†	.18*	.23**	.11	.28†	*(.84)*					
12. TCQ-D	-.03	-.04	-.06	-.02	.02	-.09	.07	.06	.02	.15	-.08	*(.77)*				
13. TCQ-P	.33†	.24**	.22**	.29†	.25**	.29†	.21*	.36†	.19*	.36†	.12	.20*	*(.68)*			
14. TCQ-W	.26†	.26†	.26†	.25**	.27**	.34†	.27†	.28†	.15	.28**	.07	.04	.43†	*(.79)*		
15. TCQ-R	-.05	-.07	-.03	-.03	-.08	-.09	.06	-.03	.08	.07	.27**	.28†	.15	.03	*(.81)*	
16. TCQ-Sc	-.02	-.04	.03	-.07	.08	-.08	-.06	.01	-.01	-.10	.10	.21**	.09	-.07	.24**	*(.88)*

Note: Cronbach's α of scales are italicised and in brackets on the diagonal; †p<.001, **p<.01, *p<.05; PSWQ=Penn State Worry Questionnaire; STAI-T=State Trait Anxiety Inventory- Trait; STAI-S=State Trait Anxiety Inventory- State; AnTI-S=Anxious Thoughts Inventory-Social worry; AnTI-H=Anxious Thoughts Inventory-Health worry; AnTI-M=Anxious Thoughts Inventory-Meta worry; MCQ-Pb=Meta-Cognitions Questionnaire-Positive beliefs; MCQ-Ud = Meta-Cognitions Questionnaire-Negative beliefs about uncontrollability and danger of worry; MCQ-Mce = Meta-Cognitions Questionnaire-Meta-cognitive efficiency; MCQ-Spr = Meta-Cognitions Questionnaire-Negative beliefs about thoughts including superstition, punishment and responsibility; MCQ-Csc = Meta-Cognitions Questionnaire-Cognitive self-consciousness; TCQ-D = Thought control Questionnaire-Distraction: TCQ-P= Thought Control Questionnaire-Punishment;TCQ-W=Thought Control Questionnaire-Worry; TCQ-R=Thought Control Questionnaire-Re-appraisal; TCQ-Sc=Thought Control Questionnaire-Social control, & RGHQoL = Recurrent Genital Herpes Quality of Life questionnaire.

(AnTI-H) (t=.30, p<.001) both subscales constituting measures of type 1 worry. The PSWQ correlated significantly with type 2 or meta-worry (AnTI-M) (t=.66, p<.001). In terms of associations between trait worry and the factors of meta-cognitive beliefs about worry, the PSWQ correlated significantly with the positive beliefs about worry (MCQ-Pb) (t=.25, p<.001), beliefs about uncontrollability and danger of worry (MCQ-Ud) (t=.51, p<.001), and negative beliefs about worry including themes of superstition, punishment and responsibility (MCQ-Spr) (t=.32, p<.001). Table 4 indicated that trait worry also correlated positively with maladaptive thought control strategies. The PSWQ correlated significantly with the punishment sub-scale of the TCQ (TCQ-P) (t=.33, p<.001) and the worry sub-scale (TCQ-W) (t.26, p<.001).

Trait anxiety (i.e. STAI-T) correlated significantly with state anxiety (i.e. STAI-S) (t=.66, p<.001), social worry (AnTI-S) (t=.61, p<.001), health worry (AnTI-H) (t=.33, p<.001) and meta-worry (AnTI-M) (t=.58, p<.001). The STAI-T also correlated significantly the beliefs about uncontrollability and danger of worry (i.e. MCQ-Ud) (t=.45, p<.001) and negative beliefs about worry including themes of superstition, punishment and responsibility (MCQ-Spr) (t=.36, p<.001). Trait anxiety (STAI-T) also correlated significantly with the TCQ worry sub-scale (t=.26, p<.001).

State anxiety (i.e. STAI-S) correlated positively with social worry (AnTI-S) (t=.48, p<.001), health worry (AnTI-H) (t=.31, p<.001), and meta-worry (AnTI-M) (t=.58, p<.001). State worry also correlated positively with beliefs about uncontrollability and danger of worry (MCQ Ud) (t=.49, p<.001), beliefs about meta-cognitive efficiency (MCQ-Mce) (t=.26, p<.001) and negative beliefs concerning superstition,

punishment and responsibility of worry (t=.29, p<.001). State anxiety also correlated with the TCQ worry sub-scale (t=.26, p<.001).

In terms of the type of worry, table 4 shows that the two factors of type 1 worry correlated significantly, and they both correlated significantly with type 2 worry. That is, the social worry (AnTI-S) and health worry (AnTI-H) correlated significantly (t=.26, p<.001), whilst social worry (AnTI-S) correlated significantly with meta-worry (i.e. AnTI-M) (t=.53, p<.001) and health worry correlated significantly with meta-worry (AnTI-M) (t=.42, p<.001).

Social worry (AnTI-S) also correlated significantly with positive beliefs about worry (MCQ-Pb) (t=.30, p<.001), beliefs about the uncontrollability and danger of worry (MCQ-Ud) (t=.37, p<.001), and the superstition, responsibility and punishment sub-scale (MCQ-Spr) (t=.39, p<.001). Social worry also correlated significantly with the TCQ punishment sub-scale (t=.29, p<.001). Health worry (AnTI-H) correlated significantly with beliefs about the uncontrollability and danger of worry (MCQ-Ud) (t=.29, p<.001).

Meta-worry (AnTI-M) correlated moderately with the positive beliefs about worry (MCQ-Pb) (t=.37, p<.001), beliefs about the uncontrollability and danger of worry (MCQ-Ud) (t=.53, p<.001), negative beliefs about worry including themes of superstition, punishment and responsibility (MCQ-Spr) (t=.43, p<.001) and cognitive self-consciousness (MCQ-Csc) (t=.27, p<.001). Meta-worry (AnTI-M) also correlated with the TCQ punishment sub-scale (TCQ-P) (t.=.29, p<.001), the TCQ worry sub-scale (TCQ-W) (t=.34, p<.001)

Significant correlation's within and between the MCQ and TCQ sub-scales were fewer with the application of the more stringent alpha level. Table 4. shows that positive beliefs about worry (MCQ-Pb) correlated significantly with negative beliefs about worry including themes of superstition, punishment and responsibility (MCQ-Spr) ($t=.33$, $p<.001$) and with the worry sub-scale of the TCQ ($t=.27$, $p<.001$). Beliefs about the uncontrollability and danger of worry (MCQ-Ud) correlated moderately with beliefs about meta-cognitive efficiency (MCQ-Mce) ($t=.31$, $p<.001$); negative beliefs about worry including themes of superstition, punishment and responsibility (MCQ-Spr) ($t=.50$, $p<.001$), and both the punishment ($t=.36$, $p<.001$). and worry ($t=.28$,$p<.001$) sub-scales of the TCQ (TCQ-P). Beliefs about meta-cognitive efficiency (MCQ-Mce) correlated with negative beliefs about worry including themes of superstition punishment and responsibility (MCQ-Spr) ($t=.29$, $p<001$). Negative beliefs about worry including themes of superstition punishment and responsibility (MCQ-Spr) also correlated with cognitive self-consciousness (MCQ-Csc) ($t=.28$, $p<.001$) and the TCQ punishment (TCQ-P) sub-scale ($t=.32$, $p<.001$). Finally, it can be seen from table 4. that worry (TCQ-W) and punishment (TCQ-P) thought control strategies had a moderate significant correlation ($t=.43$, $p<.001$), and that distraction (TCQ-D) and re-appraisal (TCQ-R) correlated significantly ($t=.28$, $p<.001$)

Cronbach' s alpha co-efficients are reported in Table 4, which measure internal consistency or reliability of items within sub-scales or factors of standardised questionnaires. This analysis is useful for checking the extent to which items within a sub-scale or factor go together, or are related, thus providing some evidence for the construct validity of that scale. Table 4 reports Cronbach's alpha for all the measures except the RGHQoL because it was only appropriate for RGH participants.

Cronbach's alpha for the RGHQoL was calculated at .95 (n = 41). All the co-efficients are above .75 except the punishment sub-scale of the TCQ (Alpha = .68).

3.4 Preliminary between group data analysis

3.4.1 Hypothesis two

Hypothesis two considered between group differences in terms of emotional vulnerability and current psychological distress. The RGH group will score significantly higher than the control group with regard to proneness to worry (i.e. PSWQ), trait anxiety (i.e. STAI-T) and state anxiety (i.e. STAI-S).

To protect against the possibility of making Type 1 errors the Bonferroni procedure calculated alpha at .02 for interpretation of the significance of the comparisons.

Table 5. Mean and standard deviation (SD) scores of the PSWQ and STAI sub-scales for the RGH and control groups.

	RGH		Controls		
Measures	M	(SD)	M	(SD)	*Statistic*
PSWQ	51.6	(14.5)	38.6	(13.8)	U = 416.0***
STAI-T	44.8	(10.4)	36.3	(10.9)	F (1,80) = 11.68***
STAI-S	39.9	(11.2)	30.5	(9.8)	U = 391.0***

Note: ***p< .001; PSWQ=Penn State Worry Questionnaire; STAI-T=State Trait Anxiety Inventory- Trait; STAI-S=State Trait Anxiety Inventory- State

Table 5 shows that the RGH group scored significantly higher than controls, at the p<.001 level, on the PSWQ, a measure of trait worry. Further analysis revealed that significantly more of the RGH group (n=12, 29%) than controls (n=3, 7%) scored over 60 on the PSWQ (χ^2= 6.6, df = 1, p<.01). This cut-off score has been used

previously to discriminate clinically significant worriers (Dugas et al., 1995). Of the 12 RGH participants who scored above cut-off, 8 (66%) were sampled from the HVA and the remaining four from the hospital samples.

Table 5 shows that the RGH group mean scores were significantly higher as calculated using ANOVA and Mann Whitney U statistics, at the $p<.001$ level, on both the STAI-S and STAI-T sub-scales respectively. These results indicated that the RGH group were experiencing significantly higher levels of anxiety symptoms (i.e. tension, apprehension etc.) at the time at which the research was conducted. Table 5 also shows that the RGH group had significantly higher levels of trait anxiety (i.e. the tendency to perceive stressful situations as threatening or dangerous) than the control group. Given these results, hypothesis two was accepted.

3.4.2 Hypothesis three

Hypothesis three considered the different aspects of meta-worry and meta-cognitive beliefs about worry. Hence there are two parts to this hypothesis.

i) There will be significant between group differences in terms of the two types of worry (Wells, 1995). The RGH group will score significantly higher on measures assessing both type 1 (i.e. AnTI-S and AnTI-H) and type 2 worry (i.e. AnTI-M).

Table 6. Mean and standard deviation (SD) scores of the AnTI and MCQ sub-scales for the RGH and control groups.

	Group	RGH		Controls		
Measures		M	(SD)	M	(SD)	*Statistic*
AnTI-S		19.3	(6.8)	16.7	(6.0)	F (1,80) = 3.7 NS
AnTI-H		10.5	(4.5)	9.5	(3.5)	U = 737.5 NS
AnTI-M		13.2	(4.6)	10.3	(3.5)	U = 480.0**
MCQ-Pb		31.7	(8.9)	29.3	(6.9)	F (1,78) = 0.98 NS
MCQ-Ud		35.9	(11.0)	27.6	(8.9)	U = 423.5***
MCQ-Mce		18.3	(5.0)	15.3	(4.7)	F (1,78) = 8.7**
MCQ-Spr		21.9	(5.9)	18.7	(4.1)	F (1,76) = 8.0**
MCQ-Csc		17.5	(4.8)	16.2	(4.8)	F (1,77) = 1.4 NS

Note: ** p< .01; ***p< .001; NS = Not significant; AnTI-S=Anxious Thoughts Inventory-Social worry; AnTI-H=Anxious Thoughts Inventory-Health worry; AnTI-M=Anxious Thoughts Inventory-Meta worry; MCQ-Pb=Meta-Cognitions Questionnaire-Positive beliefs; MCQ-Ud = Meta-Cognitions Questionnaire-Negative beliefs about uncontrollability and danger of worry; MCQ-Mce = Meta-Cognitions Questionnaire-Meta-cognitive efficiency; MCQ-Spr = Meta-Cognitions Questionnaire-Negative beliefs about thoughts including superstition, punishment and responsibility; MCQ-Csc = Meta-Cognitions Questionnaire-Cognitive self-consciousness;

The Bonferroni procedure set alpha at .02 for the interpretation of the significance of results of statistical comparisons on the AnTI sub-scales.

In terms of Type 1 worry, Table 6 shows that despite elevated mean scores for the RGH group compared to controls, there were no statistically significant differences between group means on the social and health worry sub-scales (i.e. AnTI-S and AnTI-H). Hence there were no significant between group differences in Type 1 worry.

With regard to Type 2 worry Table 6. indicates that the RGH group scored significantly higher than controls at the p<.01 level on the meta-worry sub-scale (i.e. AnTI-M). This result shows that the RGH participants were experiencing higher levels of meta-worry (i.e. worry about worry) than controls.

Overall the results for hypothesis three part one were mixed. A significant between group difference in levels of Type 2 worry was found, and yet no significant between group difference in Type 1 worry was found.

ii) There will be significant between group differences in meta-cognitive beliefs about worry (i.e. MCQ). Specifically, it is predicted that the RGH group will score significantly higher on the beliefs about uncontrollability and danger of worry sub-scale (MCQ-Ud), and negative beliefs about thoughts including themes of superstition, punishment and responsibility sub-scale (MCQ-Spr).

In relation to between group comparisons on the MCQ sub-scales the Bonferroni procedure set alpha at .01 to protect against Type 1 errors.

Table 6 reveals that both predicted results were found. The RGH group scored significantly higher than controls at the $p<.001$ level on the beliefs about uncontrollability and danger of worry sub-scale (i.e. MCQ-Ud), and at the $p<.01$ level on the negative beliefs about thoughts including themes of superstition, punishment and responsibility sub-scale (i.e. MCQ-Spr). One finding that was not predicted was that the RGH group scored significantly higher than the control group at the $p<.01$ level on the meta-cognitive efficiency sub-scale (i.e. MCQ-Mce).

The pattern of results for hypothesis three part two is mixed. Two of the predicted results were obtained but a further difference in terms of beliefs about meta-cognitive efficiency was also found.

3.4.3 Hypothesis four

Hypothesis four considered whether there were any between group differences in the strategies participants used to control unwanted or unpleasant thoughts.

There will be significant between group differences in strategies used to control unwanted or unpleasant thoughts (i.e. TCQ). Specifically, it is predicted that the RGH group will score significantly higher on the worry (TCQ-W) and punishment (TCQ-P) sub-scales.

The Bonferroni procedure set alpha at .01 for the interpretation of the significance of results of statistical comparisons on the TCQ subscales.

Table 7. Means and standard deviation (SD) scores of the TCQ sub-scales for the RGH and control groups.

	Group	**RGH**		**Controls**		
Measures		M	(SD)	M	(SD)	*Statistic*
TCQ-D		15.2	(3.7)	14.6	(3.2)	F (1,78) = 0.0 NS
TCQ-P		10.0	(3.1)	8.6	(1.8)	F (1,77) = 4.34*
TCQ-W		9.7	(3.2)	8.8	(2.7)	U = 686.0 NS
TCQ-R		13.3	(3.8)	14.1	(3.7)	F (1,75) = 0.75 NS
TCQ-Sc		13.3	(4.3)	12.9	(4.8)	U = 752.5 NS

Note: * p < .05; NS = Not significant; TCQ-D = Thought control Questionnaire-_Distraction: TCQ-P= Thought Control Questionnaire-Punishment;TCQ-W=Thought Control Questionnaire-Worry; TCQ-R=Thought Control Questionnaire-Re-appraisal; TCQ-Sc=Thought Control Questionnaire-Social control.

Table 7 reveals that there were no significant differences on the worry and punishment sub-scales of the TCQ at the p <.01 level of significance. Consequently there was insufficient evidence to support the hypothesis four that RGH participants were using more maladaptive control strategies (i.e. worry and punishment) than controls to process unwanted and/or unpleasant thoughts.

3.5 Secondary between group analysis

3.5.1 Hypothesis five

Where preliminary data analysis had revealed significant differences between the RGH and control groups on the sub-scales of the MCQ hypothesis five considered whether differences would still be significant when controlling for trait anxiety.

> There will be significant differences between the RGH and control group on the meta-cognitive efficiency (MCQ-Mce) and negative beliefs about thoughts including themes of superstition punishment and responsibility (MCQ-Spr) sub-scales, independent of the contribution of trait anxiety (i.e. STAI-T).

The results of both ANCOVAs revealed that there were no significant differences between the RGH and control group on the MCQ-Mce ($F= 3.7$, $df = 1, 77$, $p = .06$) and the MCQ-Spr ($F = .21$, $df = 1, 72$, $p = .65$) when trait anxiety was entered as a covariate. Given these findings hypothesis five was not accepted, there were neither significant differences in beliefs about meta-cognitive efficiency (MCQ-Mce) nor differences in beliefs about thoughts including themes of superstition, punishment and responsibility (MCQ-Spr) when the contribution of trait anxiety (STAI-T) was controlled for.

3.6 Secondary correlational analysis.

3.6.1 Hypothesis six

Differences between controls and GAD patients in meta-cognitive beliefs about worry (MCQ) have been reported when trait anxiety was controlled for (Cartwright-Hatton & Wells, 1997). In order to explore the association of emotional distress, and the different aspects of worry and thought control within the RGH group controlling for trait anxiety Kendall T correlations were first performed between all the measures. Table 9 in Appendix 15 report these Kendall T correlation's. The Kendall T correlation co-efficients were then used to calculate Kendall T partial correlation co-efficients (Siegel & Castellan, 1988) whereby trait anxiety (STAI-T) was partialled out.

Table 8 (overpage) displays Kendall T partial correlation co-efficients for the RGH sample (n=41). The Bonferroni procedure set alpha at $p<.001$ to protect against type 1 errors. Table 8 shows that when trait anxiety was controlled for, trait worry (PSWQ) had a significant positive correlation with meta-worry (AnTI-M) ($t=.48$, $p<.001$), and negative beliefs about worry including beliefs about the uncontrollability and danger (MCQ-Ud) ($t=.39, p<.001$). State anxiety (STAI-S) did not correlate with any other measures.

Table 8. Kendall T Partial correlation co-efficients of standardised measures for the RGH sample.

Measures	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*
1. PSWQ																
2. STAI-S	.23*															
3. AnTI-S	.16	.04														
4. AnTI-H	.17	.10	.22*													
5. AnTI-M	.48†	.23*	.39†	.35†												
6. MCQ-Pb	.12	.08	.22*	.08	.32**											
7 MCQ-Ud	.39†	.21*	.30**	.18*	.51†	.20*										
8.MCQ-Mce	.06	.00	.18*	-.09	.18*	.06	.19*									
9. MCQ-Spr	.06	-.03	.42†	.08	.31**	.36†	.35†	.27**								
10. MCQ-Csc	.14	.10	.05	.03	.23*	.08	.25**	.09	.27**							
11. TCQ-D	-.18*	-.09	-.02	.18*	-.12	.00	-.17	.05	.03	-.17						
12. TCQ-P	.16	.03	.17	.31**	.31**	.08	.32**	.01	.30**	.10	.16					
13. TCQ-W	.08	.06	.10	.25**	.32**	.28*	.13	.00	.04	.04	.00	.38†				
14. TCQ-R	-.04	-.05	.06	.12	-.08	.00	-.02	.01	.11	.28**	.35**	.13	-.04			
15. TCQ-Sc	-.03	.08	-.07	.24*	.01	-.08	.03	-.07	-.14	.12	.26	.09	-.01	.24**		
16. RGHQoL	-.17	-.22*	-.29**	-.20*	-.17	-.10	-.27**	-.09	-.37†	-.30**	.13	-.17	-.13	.02	.20*	

Note: †p<.001, **p<.01, *p<.05; PSWQ=Penn State Worry Questionnaire; STAI-S=State Trait Anxiety Inventory- State; AnTI-S=Anxious Thoughts Inventory-Social worry; AnTI-H=Anxious Thoughts Inventory-Health worry; AnTI-M=Anxious Thoughts Inventory-Meta worry; MCQ-Pb=Meta-Cognitions Questionnaire-Positive beliefs; MCQ-Ud = Meta-Cognitions Questionnaire-Negative beliefs about uncontrollability and danger of worry; MCQ-Mce = Meta-Cognitions Questionnaire-Meta-cognitive efficiency; MCQ-Spr = Meta-Cognitions Questionnaire-Negative beliefs about thoughts including superstition, punishment and responsibility; MCQ-Csc = Meta-Cognitions Questionnaire-Cognitive self-consciousness; TCQ-D = Thought control Questionnaire- Distraction: TCQ-P= Thought Control Questionnaire-Punishment;TCQ-W=Thought Control Questionnaire-Worry; TCQ-R=Thought Control Questionnaire-Re-appraisal; TCQ-Sc=Thought Control Questionnaire-Social control, & RGHQoL = Recurrent Genital Herpes Quality of Life questionnaire.

With regard to the factors underlying type 1 worry (Wells, 1995), social (AnTI-S) and health (AnTI-H) worry correlated significantly with type 2 worry or meta-worry (AnTI-M) ($t=.39$, $p<.001$) ($t=.35$, $p<.001$) respectively. Social worry (AnTI-S) also correlated with negative beliefs about thoughts, including themes of superstition punishment and responsibility (MCQ-Spr) ($t=.42$, $p<.001$). The meta-worry sub-scale (AnTI-M) correlated significantly with the beliefs about the uncontrollability and danger of worry (MCQ-Ud) ($t=.51$, $p<.001$).

In terms of meta-cognitive beliefs about worry, both the positive beliefs about worry (MCQ-Pb) and beliefs about the uncontrollability and danger of worry (MCQ-Ud) sub-scales correlated significantly with the negative beliefs about thought including themes of punishment, superstition and responsibility (MCQ-Spr) ($t=.36$, $p<.001$) ($t=.35$, $p<.001$) respectively. The meta-cognitive confidence (MCQ-Mce) and cognitive self-consciousness (MCQ-Csc) subscales failed to correlate, at the .001, level with any other measures. However, table 8 shows that negative beliefs about thoughts including themes of punishment, superstition and responsibility (MCQ-Spr) had a significant negative correlation with the RGHQoL ($t= -.37$, $p<.001$).
In terms of thought control strategies, the worry (TCQ-W) and punishment (TCQ-P) factors were significantly positively correlated ($t=.38$, $p<001$).

4.0 DISCUSSION

This section contains a discussion of the results. First a description of the aims of the study is provided followed by a summary of the results which will be considered in relation to the literature described earlier. Next the clinical implications of the results will be considered followed by a discussion of the limitations of this study. Finally some directions for future research will be outlined.

4.1 Aims of the study

The objectives of this study were three-fold. First, this study aimed to explore the relationships between the meta-cognitive variables implicated in pathological worry and measures of emotional vulnerability to evaluate whether the relationships found within this study would replicate previous findings (Cartwright-Hatton & Wells, 1997: Wells & Papageorgiou, 1998; Bouman & Meijer, 1999). A further aim was to examine differences in emotional vulnerability, meta-cognitive dimensions of worry and thought control strategies between participants with recurrent genital herpes (RGH) and a normal (healthy) control group. The final aim of the study was to explore the relationships between emotional vulnerability, meta-cognitive dimensions of worry, thought control strategies and quality of life controlling for the contribution of trait anxiety within the RGH group.

4.2 Interpretation of the results

With regard to the first hypothesis, Kendall T correlations for the entire data set were performed to explore the relationships between the measures of emotional vulnerability and the meta-cognitive variables, including thought control strategies, implicated in the maintenance of pathological worry. The results showed that all the measures of emotional vulnerability (i.e. worry proneness, trait anxiety and state anxiety) were significantly positively correlated with each other. These findings are consistent with previous research demonstrating that these constructs are closely associated (Spielberger et al., 1987; Meyer et al., 1990).

In terms of the relationship between meta-cognitive beliefs about worry and emotional vulnerability the correlation co-efficients from this study reveal that positive beliefs about worry, negative beliefs about worry including themes of superstition, punishment and responsibility and beliefs about the uncontrollability and danger of worry were positively significantly correlated to worry proneness, at the .001 level. These findings replicate those of Bouman & Meijer (1999). All five factors of the MCQ in this study were significantly positively correlated with proneness to worry at the .01 level replicating the results of Cartwright-Hatton & Wells (1997). Trait anxiety correlated with beliefs about the uncontrollability and danger of worry as well as general negative beliefs. Of the five different factors of the Meta-cognitions Questionnaire (Cartwright-Hatton & Wells, 1997), beliefs about the uncontrollability and danger of worry showed the strongest correlations with worry proneness and trait anxiety.

With regard to current psychological distress (i.e. anxiety symptoms) the correlation co-efficients showed that meta-cognitive efficiency, general negative beliefs including themes of superstition, punishment and responsibility, and beliefs about the uncontrollability and danger of worry were significantly positively correlated to state anxiety. Beliefs about the uncontrollability and danger of worry again were having the strongest correlation. The correlation of meta-cognitive efficiency with state anxiety is consistent with Davis & Valentier's (2000) finding that meta-cognitive efficiency or lack of confidence in cognitive abilities, and trait anxiety, predicts state anxiety.

Overall, these correlation results are consistent with earlier findings (Cartwright-Hatton & Wells, 1997, Bouman & Meijer, 1999) that metacognitive beliefs about worry, particularly beliefs about the uncontrollability and danger of worry, are strongly related to measures of emotional vulnerability and psychological distress.

Wells and Carter (1999) had previously demonstrated that meta-worry predicts pathological worry independently of Type 1 worry. Correlation co-efficients in this study revealed that both social and health (Type 1) worry were significantly positively correlated with each other as well as with meta-worry (Type 2 worry). Worry proneness was significantly positively correlated with both health and social worry (Type 1 worry) and more strongly with meta-worry replicating Wells and Carter's (1999) findings. In terms of correlations with meta-cognitive beliefs about worry, Type 1 and 2 worry were significantly positively correlated with beliefs about the uncontrollability and danger of worry, with meta-worry showing the strongest association. Social and meta-worry also correlated with general negative beliefs about

worry including themes of superstition, punishment and responsibility. Meta- worry correlated with cognitive self-consciousness.

As regards maladaptive thought control strategies, the results revealed that worry proneness was significantly positively correlated with both punishment and worry thought control strategies, whilst trait and state anxiety correlated only with worry as a thought control strategy. This result differs from Wells & Davies (1994) findings in that they found that both punishment and worry correlated with worry proneness and trait anxiety. However in their study alpha was set at the .01 level, and the results from this study show that if the same alpha level were to be applied the same pattern of results would be obtained in this study.

The results of the correlations within the entire data set in this study between the measures of meta-cognitive dimensions of worry, including thought control strategies, and emotional vulnerability as well as current psychological distress appear to replicate the findings of earlier correlations (Cartwright-Hatton & Wells, 1997: Wells & Papageorgiou, 1998; Bouman & Meijer, 1999). These findings are consistent with the relationships between meta-cognitive variables proposed to be implicated in the maintenance of pathological worry (Wells, 1995). Hence these results provide further convergent evidence that the construct of meta-worry and meta-cognitive beliefs about worry are related to pathological worry, as predicted by Wells' (1995) model.

The second aim of this study was concerned with examining differences between RGH participants and normal controls in terms of emotional vulnerability including current anxiety symptoms, meta-cognitive dimensions of worry and thought control

strategies. Previous research had reported higher levels of worry in participants with various chronic health problems (e.g. Fortune et al., 1999). Based on these findings hypothesis two predicted that participants with recurrent genital herpes, a chronic and incurable sexually transmitted disease, would show higher levels of emotional vulnerability including current psychological distress (i.e. proneness to worry, trait anxiety and state anxiety).

The results showed that the RGH group scored significantly higher on both measures of emotional vulnerability (i.e. trait anxiety and proneness to worry) and on the measure of current psychological distress (i.e. state anxiety). The results also found that significantly more of the RGH group (n=12, 29%) compared to the control group (n=3, 7%) scored over 60 on the PSWQ (Meyer at al., 1990) indicating that more RGH participants had higher levels of worry proneness. Taken together these results show that the RGH group had significantly higher levels of current anxiety symptoms, and significantly higher levels of trait anxiety and worry proneness. These results are consistent with previous research that has shown that people with other chronic health problems experience high levels of worry (e.g. Fortune et al., 2000) and is also consistent with findings that people with genital herpes experience high rates of psychological distress (Green & Koscis, 1997; Shah & Button, 1998) and anecdotal evidence of high rates of worry in people with RGH (Derman, 1986; Lynch, 1988).

Hypothesis three predicted that there would be significant differences between participants with recurrent genital herpes and the control group in terms of meta-cognitive beliefs about worry and type of worry.

The results of the analysis comparing group differences regarding meta-cognitive beliefs about worry showed that the RGH group scored significantly higher than controls in terms of negative beliefs about the uncontrollability and danger of worry, and negative beliefs including themes of superstition, punishment and responsibility. These results replicate the findings of Wells & Carter (2001) who found that GAD patients scored significantly higher than controls on the same two sub-scales. However, the results of the comparisons also found that RGH participants also scored significantly higher than controls with regard to beliefs about meta-cognitive efficiency, indicating that RGH participants were less confident about their cognitive abilities. Davis & Valentier (2000) found that GAD participants scored significant higher than non-anxious controls on all five of the sub-scales of the Meta-cognitions questionnaire (MCQ), and they also found that beliefs about meta-cognitive efficiency was a predictor of state anxiety. Further analysis, using ANCOVA to control for the contribution of trait anxiety to scores on the MCQ revealed no significant differences between the RGH group and the control group in terms of beliefs about meta-cognitive efficiency and negative beliefs about worry including themes of superstition, punishment and responsibility. This suggests that trait anxiety was contributing to the elevated scores on these two sub-scales. Unfortunately the contribution of trait anxiety to beliefs about the uncontrollability and danger of worry could not be examined further as the data did not fit the parametric assumptions required for ANCOVA.

With regard to Wells (1995) distinction between different types of worry the results showed that despite elevated scores for RGH participants on Anxious Thoughts Inventory (AnTI) health and social worry sub-scales (i.e. Type 1 worry) compared to

controls, the differences failed to reach significance. Higher levels of social and health worry (i.e. Type 1 worry) were anticipated given the chronic, incurable nature of genital herpes, uncertainty about recurrence of symptoms and social stigma associated with this disease. However the results showed that the RGH group scored significantly higher than the controls in terms of Type 2 or meta-worry (i.e. worry about worry). Since significantly more of the RGH group scored within the clinical range on the PSWQ, this result is consistent with Wells and Carter's (2001) finding that meta-worry is a predictor of pathological worry. Compared to other emotionally disordered groups, GAD participants who by definition experience high levels of excessive and uncontrollable worry also experienced significantly higher levels of meta-worry.

Hypothesis four predicted differences between the RGH and control group in terms of maladaptive thought control strategies. However despite elevated scores for the RGH participants on the punishment and worry sub-scales of the Thought control Questionnaire (TCQ, Wells & Davies, 1994) the differences failed to reach significance at the .01 level. This result was surprising given that maladaptive thought control strategies had been found to be associated with high levels of worry proneness and trait anxiety (Wells & Davies, 1994) which were replicated in this study.

The final aim of the study was to explore the relationships between emotional vulnerability, metacognitive dimensions of worry, thought control strategies and quality of life in the RGH group controlling for the contribution of trait anxiety. The Kendall-T partial correlations revealed some interesting results. The results showed that when trait anxiety was controlled for, worry proneness was significantly

positively correlated with meta- worry and beliefs about the uncontrollability and danger of worry, whereas current anxiety symptoms did not correlate with any other measures. These findings are consistent with earlier findings that meta-worry and beliefs about controllability are closely associated with pathological worry (Cartwright-Hatton & Wells, 1997: Wells & Papageorgiou, 1998; Bouman & Meijer, 1999; Wells & Carter, 1999). As regards the type of worry social and health worry were significantly positively correlated with meta-worry, and social worry was significantly positively correlated with negative beliefs about worry including themes of superstition, punishment and responsibility. Meta-worry was significantly positively correlated with negative beliefs about the uncontrollability and danger of worry. In terms of meta-cognitive beliefs about worry both positive beliefs and beliefs about controllability were significantly positively correlated with general negative beliefs about worry including themes of superstition, punishment and responsibility. General negative beliefs was also significantly negatively correlated with scores on the RGHQoL instrument, indicating that endorsement of negative beliefs about worrying are (e.g. 'should be in control of my thoughts all the time', 'It is bad to think certain thoughts') are associated with poorer quality of life. Finally the Kendall-T partial correlations showed that worry and punishment thought control strategies were significantly positively correlated with each other.

4.3 Clinical implications of the results

The Department of Health (2001) has recently recognised that the emotional needs of sexual health service users, including patients with RGH, are a priority in terms of delivery of appropriate services. The results of this study showed that, compared to

normal controls, RGH participants demonstrated significantly higher levels of trait anxiety and current anxiety symptoms. Furthermore, significantly more of the RGH participants were experiencing higher levels of proneness to worry. These results are consistent with earlier reports of elevated levels of psychopathology in people with RGH (Green & Koscis, 1997; Shah & Button, 1998) and highlight further the need for appropriate assessment and management of emotional vulnerability, including current psychological distress, for these patients.

The results of this study also revealed that worry proneness was significantly correlated with meta-worry and beliefs about the uncontrollability and danger of worry, when trait anxiety was controlled for, within the RGH group. These results suggest that high scorers on the Penn State Worry Questionnaire (PSWQ, Meyer et al., 1990) are likely to experience meta-worry and hold negative beliefs about the uncontrollability of worry, both of which are implicated in the maintenance of pathological worry (Wells, 1995). Hence appropriate assessment of worry in RGH patients could be achieved using the PSWQ (Meyer et al., 1990), with those scoring 60 or above being further assessed by the AnTI (Wells, 1994) or MCQ (Cartwright-Hatton & Wells, 1997).

In terms of psychological intervention, the results of this study are more difficult to elucidate. Analysis demonstrated between group differences in terms of meta-worry, beliefs about the uncontrollability and danger of worry, negative beliefs including themes of superstition, punishment and responsibility and meta-cognitive efficiency. When trait anxiety was entered as a covariate the differences between the groups in terms of negative beliefs including themes of superstition, punishment and

responsibility, and meta-cognitive efficiency disappeared suggesting that trait anxiety was contributing to the differences in meta-cognitive dimensions of worry initially found. Unfortunately, between group differences regarding meta-worry and beliefs about the uncontrollability and danger of worry could not be subjected to the same ANCOVA analysis, hence the contribution of trait anxiety to these findings remains less clear. If ANCOVA calculations were possible on the remaining meta-cognitive dimensions, and the contribution of trait anxiety had eliminated the between group differences, then the results would suggest that trait anxiety would need to be the focus for clinical intervention for patients with RGH prone to worry. However, within RGH group partial correlations revealed that when the contribution of trait anxiety was controlled for, significant correlations remained between worry proneness and meta-worry, and worry proneness and beliefs about the uncontrollability and danger of worry. Both of these meta-cognitive dimensions being central to Wells' (1995) meta-cognitive model of worry. Hence, the results of these partial correlations suggest that group differences in terms of meta-worry and beliefs about the uncontrollability and danger of worry may have remained if trait anxiety had been entered as a covariate. This interpretation of the results suggests that meta-worry and beliefs about the uncontrollability and danger of worry are implicated in pathological worry for participants with RGH and should therefore addressed within psychological intervention. Wells (1997) has comprehensively described cognitive behavioural techniques aimed at challenging meta-worry and meta-cognitive beliefs about worry, however as yet no trials of meta-cognitive therapy have been reported.

The partial correlations within the RGH group data also revealed that negative beliefs about worry including themes of superstition, punishment and responsibility were

significantly correlated with the Recurrent Genital Herpes Quality of Life instrument (RGHQoL, Doward and McKenna, 1998) when trait anxiety was partialled out. That is low scores on the RGHQoL are associated with high levels of negative beliefs in general about worry. Clinically, these results suggest that general negative beliefs about worry should also become the focus of psychological intervention.

The results of this study need also to be considered in relation to the S-REF model of emotional disorder (Wells & Matthews, 1994; 1996). The onset of symptoms associated with chronic illness (e.g. RGH) may activate the S-REF itself given that the experience of symptoms is likely to interfere with goal attainment (e.g. Hunt & McKenna, 1992). Furthermore S-REF activity associated with symptom onset is likely to amplify self-focused attention (in object mode) appraising the significance of the symptoms, which may deplete attentional resources and lower the threshold for detecting other symptom-related information. Following the activation of the S-REF, Wells & Matthews (1994) propose that the S-REF accesses self-knowledge to guide appraisal of the situation (e.g. symptom type, intensity etc.) and determine the execution of adaptive coping strategies to return the individual to a normal state whereby S-REF activity ceases or dissipates. So for example, with the onset of symptoms in chronic illness an individual accesses self-knowledge that promotes adaptive coping. For people with HSV infection, symptom onset may be associated with elevated worry about health or social consequences of the symptoms (e.g. Hunt & McKenna, 1992) or type 1 worry (Wells, 1995). With the adoption of adaptive coping strategies (e.g. palliative care, stress reduction techniques) the S-REF activity diminishes. In a different health population, there is some evidence that this process occurs. Women who worry about cancer symptoms, with a known family history of

developing cancer are more likely to seek surgical treatment (Fry, Rush, Busby-Earle & Cull, 2001) and less likely to worry about symptoms post-operatively (Fry, Busby-Earle, Rush & Cull, 2001).. However, in individuals with chronic illness, who may also be also prone to distress, the person may fail to fulfil the self-regulatory goal and the S-REF becomes perseverative. Wells & Matthews (1994) propose that failure to achieve goals is related to the selection of maladaptive coping strategies (i.e. thought control, worry and monitoring of threat). With regard to worrying, once type 1 worry is activated it is likely to trigger type 2 worry or meta-worry (Wells, 1995). The results from this study indicate that RGH participants were experiencing elevated levels of pathological worry, elevated levels of meta-worry and elevated levels of negative meta-cognitive beliefs about worry. Furthermore, there was an inverse relationship between negative beliefs about worry including themes of superstition, punishment and responsibility and quality of life, controlling for trait anxiety. These data suggest that the S-REF is more likely to be perseverative for RGH participants, who are emotionally vulnerable, in this study. If moderate levels of stress, including worry, predict RGH outbreaks (Cohen et al., 1999) then maybe perseverative S-REF activity is a correlate of symptom recurrence. Hence, akin to Sharp's (2001) model of cognition in pain, may be people with RGH when exposed to stressful situations start to worry about the situation and the impact stress will have on their health. With the onset of symptoms perhaps they worry that they do not cope well with stress, and then worry that they worry which activates negative meta-cognitive beliefs (e.g. "I should be in control of my thoughts all the time" "I will be punished for not controlling my thoughts") which exacerbates worry, and maintains S-REF perseveration. This hypothesis remains to be examined further. More generally, given that elevated levels of worry have been widely reported for other chronic illness populations (e.g. asthma,

cancer, pain etc.) and worry has been found to be a mediating factor in asthma attacks (Sarafino et al., 2001) the S-REF model of emotional disorder (Wells & Matthews, 1994) may have important theoretical implications for the study of worry in physical health populations.

4.4 Critical evaluation of the study

The results of this study need to be interpreted cautiously and in the context of a number of limitations. First, the representativeness of the sample of participants used in this study must be considered. Of the RGH sample (n=41), 35 (65%) were recruited through an advert in the quarterly journal of the Herpes Viruses Association (HVA) an independent sector organisation offering information and support for people with HSV infection. The HVA was used for sampling because of slow recruitment at both hospital Departments of Genito-Urinary Medicine (GUM). The literature has previously reported difficulties of recruiting participants with STDs from GUM clinics (Green & Koscis, 1997). HVA members are unlikely to be representative of RGH patients attending GUM for treatment. Individuals who join self help groups or subscribe to newsletters about herpes may be experiencing the greatest level of difficulty in adjustment to genital herpes, higher levels of psychological distress or they may be experiencing more severe symptoms (Green & Koscis, 1997). Even if this speculation is accurate, HVA members may be coping more adaptively by seeking out information about genital herpes or gaining social support by joining self-help groups. However, the HVA members who responded to the advert for the study may be unrepresentative of the wider HVA membership, as they were self-selected and therefore may be individuals who are more prone to worry or psychological

distress, or who experience more severe symptoms. For these reasons it is highly unlikely that the sample is representative of patients with symptomatic or asymptomatic HSV infection. Rein's (2000) criticism of Cohen et al.'s (1999) study applies also to this study in that RGH participants consisted wholly of people who experienced outbreaks of visible genital herpes lesions. Further study of worry or psychological distress in patients with RGH or any STD should aim to recruit samples representative of GUM clinic attenders.

One ethical consideration raised by this study is the management of psychologically distressed participants and the possibility that the standardised questionnaires raised awareness of distress for some respondents. With regard to the hospital samples, each GUM department had dedicated sessions from a clinical psychologist and referal for psychological assessment was made available for participants who were either distressed or developed distress during or following their participation in the research. The sample recruited via the HVA were possibly more vulnerable in terms of not being recruited from GUM departments with access to specialist psychological care. However HVA participants were all members of the organisation which promotes medical and psycho-social care of people with HSV infection. As such they had opportunities for support from the organisation itself. In this study participants from both samples were also given the authors contact details for any queries raised by the research. Furthermore, the inclusion and exclusion criteria, and, the information sheets detailing the aims of the project and emphasising that participants were free to withdraw from the study at any time, all served to ensure that informed consent was given by respondents prior to receipt of questionnaires.

With regard to the demographic characteristics of the sample analysis revealed that significantly more of the control group (n=19, 46%) were married or cohabiting than the RGH group (n=32, 78%). Furthermore, in terms of educational level there was a trend showing a greater number of graduates in the control group (n=10, 24%) than the RGH group (n=18, 44%). These differences between the groups highlight the problems with non-probabilistic sampling methods and indicate that a matched-subjects design may have controlled for these demographic differences.

The sample size was smaller than the power analysis had calculated as being appropriate for tests of difference, although smaller sample sizes were reported in the literature (e.g. Reynolds & Wells, 1999). This also reduces the power of the analysis, even though stringent Bonferroni adjustments of alpha were applied. Problems with the data meeting the appropriate criteria for parametric testing meant that examination of the contribution of trait anxiety to between group differences in meta-worry and beliefs about the uncontrollability and danger of worry, were not possible. The contribution of trait anxiety remains to be examined further. Furthermore, if the data had met normal distribution and homogeniety of variance assumptions it may have been possible to have conducted further multivariate analysis. For example, Discriminant Function Analysis (DFA) could have been performed to investigate whether meta-cognitive factors predicted to discriminate the groups would differentiate between participants, or multiple regression could have been performed to explore whether meta-cognitive dimensions of worry would predict pathological worry in the RGH sample.

With regard to the design of the study, there are a number of problems that need considering. First, the construction of the standardised questionnaires may effect the validity of the results. For example, the Meta-Cognitions Questionnaire (MCQ, Cartwright-Hatton and Wells, 1997) and the Thought Control Questionnaire (TCQ, Wells & Davies, 1994) have few reversed items, which may jeopardise the internal validity of these measures. Second, the length of the questionnaires may have either discouraged participation or increased demand characteristics. Yammarino, Skinner & Childers (1991) in a meta-analytic review of survey response behaviour have shown that questionnaire length is likely to influence survey response rate. They conclude that questionnaires exceeding four pages in length are likely to minimise response rates. In this study, the length of the questionnaire for the control group was eight pages and ten pages for the RGH group. Hence the length of the questionnaires used in this study may have contributed to lower response rates. Surveys investigating meta-cognitive dimensions of worry in future would possibly maximise response rates if questionnaire length were more appropriate. From an ethical point of view, the length of the questionnaires meant that respondents had to give up time to complete the questionnaires, which from an earlier pilot study, was estimated to be 15-20 minutes (see Method section). However, participants were informed on the information sheets that they could withdraw from the study at any point, and that this would have no impact on the quality of care or treatment they could expect to receive from health professionals. Hence participants were informed that they had the option of withdrawing from the study at any time.

4.5 Implications for future research

The results of this study found between group differences in terms of emotional vulnerability including current psychological distress, meta-worry and meta-cognitive dimensions of worry. The results also demonstrated that within the RGH group, meta-worry and beliefs about the uncontrollability of worry were significantly positively correlated with worry proneness, and that negative beliefs about worry were correlated with poorer quality of life, when trait anxiety was controlled for. Future research with RGH patients should examine meta-cognitive dimensions of worry in more representative samples. For example, using probabilistic sampling from larger hospital populations a comparison of symptomatic versus asymptomatic RGH patients could address questions about whether worry is associated with uncertainty about outbreaks or the visibility of symptoms.

The literature review showed that elevated levels of worry were evident in a number of different populations with chronic health problems (e.g. asthma, psoriasis, and chronic pain). It seems highly likely that chronic health problems, with their uncertain prognoses and outcomes (White, 2001) provide the conditions for worry to develop as a coping strategy (Wells, 1999). These conditions thus provide the basis for the development of meta-cognitive beliefs about worry, implicated in the maintenance of pathological worry (Wells, 1995). Further investigation of worry and particularly the role meta-cognitive dimensions of worry need to be conducted within different populations across a range of chronic health problems. Different control groups are also needed for comparison. For example, populations with chronic incurable diseases could be compared with populations with genetic disorders, where uncertainty of

symptom development is evident. Control groups could consist of populations with acute, curable diseases or populations of emotionally disordered psychiatric patients (e.g. GAD). Moreover, Sharp (2001) has proposed that chronic pain patients may experience specific meta-cognitive beliefs about pain-related worry. Further investigation is needed about whether there are health problem specific meta-cognitive beliefs about worry that reflect the worry themes of different populations with chronic health problems.

In spite of the finding of no between group differences in terms of maladaptive thought control strategies within this study, the S-REF model (Matthews and Wells, 1994) and the meta-cognitive model of pathological worry (Wells, 1995) predict that they should be associated with pathological worry. Therefore further investigation of maladaptive thought control strategies is required in GAD populations as well as within chronic health populations.

Further study of the components of Wells' (1995) model need to be examined. For example further elucidation is required of the proposed maintaining factors of worry: avoidance of triggers of worry, re-assurance seeking, and distraction. These strategies are proposed to reduce opportunities to disconfirm Type 2 worry (Wells, 1995). Hence future study could examine whether avoidance or reassurance seeking affects information seeking and health seeking behaviour, and if so whether meta-worry is implicated in this process. Furthermore, investigation of the role of meta-worry and it's relationship to cognitive mediating factors that can trigger symptoms (e.g. asthma) could be fruitful.

Finally, future studies of worry in people with chronic health problems should examine different models of worry as outlined earlier in the literature review. For example, Dugas et al (1998) propose that 'intolerance of uncertainty' is central to the maintenance of pathological worry in GAD. This theory of worry, and other models of worry, need further exploration in populations where elevated levels of worry are evident, like patients with chronic health problems.

These are only some examples of further research that could be conducted, however the aims of such research should be to both challenge and expand theoretical understandings of worry, and to further develop the applicability and relevance of these to clinical intervention.

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6.0 APPENDICES

6.1 Appendix 1) Letter of invitation for hospital RGH participants

Date:

To:

Dear

Study title: The effect of worry upon the way people cope with and adjust to having genital herpes

Principal Researcher: Nic Wilkinson (Trainee Clinical Psychologist)

A research study is being carried out at the Department of Genito-Urinary Medicine, XXXXX Hospital, Sheffield by Nicolas Wilkinson (Doctorate Trainee Clinical Psychologist, Department of Medical & Health Psychology, Leicester Royal Infirmary).

The aim of the study is to look at how worry affects a person's ability to cope with genital herpes. People attending the GUM clinic for treatment of genital herpes, are being invited to attend an interview to answer questions and fill out some questionnaires about worry and coping with genital herpes.

If you are interested and would like to take part in this study, details of which are given on the information sheet (enclosed), please complete the reply slip enclosed with this letter and return it in the pre-paid envelope. We will then contact you to arrange a convenient time to obtain your consent. The researcher will then contact you to arrange a convenient time for you to attend an interview.

I would like to thank you for taking time to read this letter and hope to hear from you soon. If you have any further queries, please contact Nicolas Wilkinson (Principal Researcher) on the telephone number below.

Yours sincerely

Dr.
(Head of Department)
Department of Genito-Urinary Medicine

For further information please contact in confidence: Nic Wilkinson (Trainee Clinical Psychologist) Department of Medical Psychology, Victoria Wing (Rm 13), Leicester Royal Infirmary, Leicester. Telephone No: (0116) 258 5227 or 258 4958

Reply Slip

Study title; The effect of worry upon the way people cope with and adjust to having genital herpes

Principal Researcher: Nic Wilkinson (Trainee Clinical Psychologist)

- I am interested in taking part in the above study and agree to the research investigator contacting me:

- I understand that I am under no obligation to take part in the study

Name: .....

Address: .....

.....

.....

Telephone No: .....

Date: .....

Please return in the enclosed pre-paid envelope to:

Nicolas Wilkinson
(Doctorate Trainee Clinical Psychologist)
Department of Medical Psychology
Victoria Wing (Room 13)
Leicester Royal Infirmary
Leicester LE1 5WW

Thank you.

6.2 Appendix 2) Information sheet for hospital RGH participants

Date:
Ref No: IS/412

Patient Information Sheet

Study title: **The effect of worry upon the way people cope with and adjust to having genital herpes**

Principal Researcher: Nic Wilkinson (Trainee Clinical Psychologist)

You are being invited to take part in a research study. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with friends, relatives and your GP if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.
Consumers for Ethics in Research (CERES) publish a leaflet entitled 'Medical Research and You'. This leaflet gives more information about medical research and looks at some questions you may want to ask. A copy may be obtained from CERES, PO Box 1365, London N16 0BW.

1. What is the purpose of the study?
Worrying about health and everyday events is normal. However, there has been little research looking at the effect of worrying upon health problems. Some recent research has shown that worrying may affect a person's ability to cope with and recover from illness. The aim of my research is to look at how worrying affects a persons ability to cope with the experience of having genital herpes. The results of this study will improve current understanding of the nature and role of worrying in relation to genital herpes, and the impact that worrying has on patient's experience of their illness.

2. What will be involved if we agree to take part in the study?
I am interested in interviewing people who have received treatment for genital herpes at the Department of Genito-Urinary Medicine (GUM), XXXXXX Hospital, (TOWN). If you agree to take part, you will be invited to attend an interview within which you will be asked some questions and asked to fill out some questionnaires. The questionnaires will assess the type of worry you may be experiencing, what you think about your worry, and, how you have coped and adjusted to having genital herpes. The interview will last for no longer than one hour.

3. When and where will the interviews take place?
The interview can be held at the GUM clinic (HOSPITAL) or, if this is not convenient for you alternative arrangements can be made.

4. What other information will be collected in the study?
With your agreement, I will obtain information about your diagnosis and treatment from your medical notes.

5. Will the information obtained in the study be confidential?
The information you provide at interview will be anonymous, held separately from your medical records, and treated with the usual degree of confidentiality under the data protection act. No names, addresses or other information which could identify you will be held on computer or appear in any reports relating to this study. Only your agreement to take part in this study will be recorded in your medical records held at GUM.

6. Will anyone else be told about my participation in the study?

Only with your agreement, will your family doctor be informed that you are helping with this study.

7. Can I withdraw from the study at any time?

Yes. You can refuse to join the study, you may withdraw at any time or choose not to answer certain questions. Whether you join the study or not you will receive the same quality of care.

8. What if I want to make a complaint or something goes wrong?

If you have *any* cause to complain about *any* aspect of the way in which you have been approached or treated during the course of this study, the normal National Health Service complaints mechanisms are available to you and are not compromised in any way because you have taken part in a research study.

If you have any complaints or concerns please contact the project co-ordinator Nic Wilkinson at the address given below. Or you can use the complaints procedure at the University of Leicester and contact: Dr. Konstantine Loumidis (Acting Course Director), Department of Applied Psychology – Clinical Section, University of Leicester, University Road, Leicester, LE1 7RH.

Medical research is covered for mishaps in the same way, as for patients undergoing treatment in the NHS (i.e. compensation is only available if negligence occurs).

9. What will happen to the results of the study?

The results of the study will be written up into a report that is submitted to the University of Leicester. Summaries of the final report will be available from the principal investigator at the address given below or from GUM, XXXX Hospital, (TOWN). It is my intention that the results will also be published in an academic psychology journal towards the end of this year. Please note that you will not be identified in any report or publication.

10. Who is organising and funding the research?

This study is being conducted with the collaboration of two Departments of Genito-Urinary Medicine within the region (i.e. the Royal Hallamshire Hospital, Sheffield and the Royal Infirmary, Leicester). The research is being organised and funded by the Department of Applied Psychology – Clinical Section, University of Leicester.

11. Who has reviewed the study?

The study has been reviewed and approved by three committees: the South Sheffield Ethics Committee, the Leicestershire Health Authority Ethics Committee and the Research Committee of the Department of Applied Psychology – Clinical Section, University of Leicester.

12. What if I want more information or want to take part in the study?

- If you require any further information you can either contact the health advisors at the GUM clinic on the above telephone number or you can contact, in confidence, the principal researcher Nic Wilkinson (Trainee Clinical Psychologist) at the address below.

- If you would like to take part in the study please complete the reply slip (attached) and return it in confidence in the stamped address envelope to the principal researcher.

Thankyou for your time.

Nic Wilkinson (Trainee Clinical Psychologist) Department of Medical Psychology, Leicester General Hospital, Leicester LE5 4PW Tel: (0116) 258 4958.

Reply Slip

Study reference no: IS/412

Principal Researcher: Nicolas Wilkinson (Trainee Clinical Psychologist)

- I am interested in taking part in the above study and agree to the research investigator contacting me:

- I understand that I am under no obligation to take part in the study

Name: .....

Address: .....

.....

.....

Telephone No: .....

Date: .....

Please return in the enclosed pre-paid envelope to:

Nicolas Wilkinson
(Doctorate Trainee Clinical Psychologist)
Department of Medical Psychology,
Leicester General Hospital,
Leicester LE5 4PW

Tel: (0116) 258 4958

Thank you .

6.3 Appendix 3) Consent form for hospital RGH participants

Centre Number: :
Study Number: 00/412
Patient Identification Number for this trial:

Consent Form

Study title: The effect of worry upon the way people cope with and adjust to having genital herpes

Principal Researcher: Nic Wilkinson (Trainee Clinical Psychologist)

Please initial on the dotted line

1. I confirm that I have read and understand the information sheet dated 20th January 2001 (version IS/412) for the above study and have had the opportunity to ask questions. .....

2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, without my medical care or legal rights being affected. .....

3. I understand that sections of any of my medical notes may be looked at by the principal investigator and responsible individuals from the Department of Genito-Urinary Medicine, XXXX Hospital, (Town) or from regulatory authorities where it is relevant to my taking part in research. I give permission for these individuals to have access to my records. .....

4. I agree to take part in the above study. .....

Name of Patient	Date	Signature
Name of Person taking consent (if different from researcher)	Date	Signature
Researcher	Date	Signature

1 for patient; 1 for researcher; 1 to be kept with hospital notes

6.4 Appendix 4) Advert in SPHERE

Worrying and genital herpes.

- **Do you sometimes worry?**
- **Would you like to help out in a study about worrying?**

Worrying is something that most of us do from time to time and we can worry about all sorts of things (e.g. money, health, relationships, getting things done etc) – the list could be endless.

Research in psychology has begun to look at worrying and the impact it has on peoples' lives. However, there has been little research looking at the impact of worrying upon health problems. Medical psychology is concerned with understanding the links between what people think, what people feel and what people do in relation to their health problem(s). Recent research in this area has shown that worrying may affect a person's ability to cope with and recover from illness.

The aim of this research is to look at how worrying affects a persons ability to cope with the experience of having genital herpes. The results of this study will improve current understanding of the nature and role of worrying in relation to genital herpes. A summary of the results will be published in a later issue of this journal.

Your help in this research about worrying would be really appreciated.

- **What will be involved if I take part in the study?**

If you are interested in taking part you need to ring the telephone number below to order your questionnaire. Once you have received your questionnaire all you have to do is to fill it out, which will only take between 15-20 minutes. And then return the questionnaire in the stamped addressed envelope provided.

The questionnaires will mainly ask about your worries, and there will be some questions about what it is like living with genital herpes.

- **Will information obtained in the study be confidential?**

YES. All the information you provide will be anonymous, and treated with the usual degree of confidentiality under the data protection act. No names, addresses or other information which could identify you will be held on computer or appear in any reports relating to this study.

If you are interested in taking part or would like further information, please ring me on 0116 258 8228 or email me at the address below.

Thankyou for your help

Nicolas Wilkinson, (Trainee Clinical Psychologist), Department of Medical Psychology, Leicester General Hospital, Leicester LE5 4PW.
Tel: 0116 258 8228 or email: medpsy@lineone.net

6.5 Appendix 5) Information sheet for HVA RGH participants

INFORMATION SHEET

(Ref 01/01)

Research title: Worry, and it's role in adjustment to genital herpes.

Principal Researcher: Nicolas Wilkinson (Doctorate Trainee Clinical Psychologist)

Supervised by: Noelle Robertson (Consultant Clinical Psychologist, Department of Medical & Health Psychology) and Dr. Konstantine Loumidis (Lecturer in Clinical Psychology, University of Leicester and Chartered Clinical Psychologist, Leicester General Hospital).

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1. What is the purpose of the study?

I would like to invite you to participate in the above about worrying in relation to genital herpes. Worrying about health and everyday events is normal. However, there has been little research looking at the effect of worrying on health problems. Some recent research has shown that worrying may affect a person's ability to cope with and recover from illness. The aim of my research is to look at how worrying affects a persons ability to cope with the experience of having genital herpes. The results of this study will improve current understanding of the nature and role of worrying in relation to genital herpes, and the impact that worrying has on patient's experience of their illness.

2. What will be involved if I take part in the study?

If you agree to take part, you will be sent some questionnaires to fill in. The questionnaires will assess the type of worry you may be experiencing, what you think about your worry, and, and how you have adjusted to having genital herpes. The questionnaires will take about 15-20 minutes to complete.

3. Will information obtained in the study be confidential?

The information you provide will be anonymous, and treated with the usual degree of confidentiality under the data protection act. No names, addresses or other information which could identify you will be held on computer or appear in any reports relating to this study. Only your agreement to take part in this study will be recorded. Furthermore, the information that you provide will in no way affect the care or treatment you receive at any part of the NHS.

4. What if I am harmed by the study?

Medical research is covered for mishaps in the same way, as for patients undergoing treatment in the NHS (i.e. compensation is only available if negligence occurs). If you do not wish to participate in this study or if you wish to withdraw from the study you may do so without justifying your decision and your future treatment will not be affected.

If you are interested in taking part in this study please complete the consent and return it with your completed questionnaires in the stamped addressed envelope provided. Thank you.

Nicolas Wilkinson, Department of Medical Psychology, Hadley House Leicester General Hospital, Leicester LE5 4PW. Tel: (0116) 258 8228 Email: medpsy@lineone.net.

6.6 Appendix 6) Consent form for HVA RGH participants

CONSENT FORM

Research title: Worry, and it's role in adjustment to genital herpes.

Principal Researcher: Nicolas Wilkinson (Doctorate Trainee Clinical Psychologist)

Supervised by: Noelle Robertson (Consultant Clinical Psychologist, Head of Department of Medical & Health Psychology) and Dr. Konstantine Loumidis (Lecturer in Clinical Psychology, University of Leicester and Chartered Clinical Psychologist, Leicester General Hospital).

This form should be read in conjunction with the INFORMATION SHEET (Ref No. 01/01).

I agree to take part in the above study as described in the INFORMATION SHEET.

I understand that I may withdraw from the study at any time without justifying my decision and without affecting my normal care and medical management.

I understand that all the information will be treated as confidential.

I understand medical research is covered for mishaps in the same way as for patients undergoing treatment in the NHS (i.e. compensation is only available if negligence occurs).

I have read the INFORMATION SHEET on the above study and have had the opportunity to discuss the details and ask any questions with Nic Wilkinson (Trainee Clinical Psychologist). The nature and the purpose of the questionnaire to be undertaken has been explained to me and I understand what will be required if I take part in the study.

Signature.....Date.....

(Name in BLOCK LETTERS).....

6.7 Appendix 7) Demographic sheet for RGH participants

Section 1. About you

I am interested in getting a full picture of the people taking part in this research. Please tick and answer the following items as accurately as you can.

Age ..... Gender .....

Ethnic identity:
☐ Indian ☐ Pakistani
☐ Bangladeshi ☐ Chinese
☐ Asian (other) ☐ Black (African)
☐ Black (Caribbean) ☐ Black (other)
☐White (European) ☐ White (Other)
If other (please specify .....

Employment status:
☐ Full time Employed
☐ Part time Employed
☐ Out of paid Employment
☐ On sickness benefit
☐ Retired
☐ Other .....

Educational level:
☐ Left school at 16
☐ CSE/O level/GCSE
☐ GCSE A level/HNC/HND
☐ University degree
☐ Post graduate degree
☐ Vocational qualification
☐ Other .....

Relationship status:
☐ single
☐ cohabiting
☐ married

Sexual orientation:
☐ Heterosexual ☐ Gay
☐ Lesbian ☐ Bisexual
☐ other (please specify)
.....

Section 2. About your health

Please answer the following items as accurately as you can.

1. Have you been given a herpes diagnosis?

☐ Yes ☐ No ☐ Not sure

2. What is the length of time since your diagnosis ?

Years...../ Months ...../ Days.....

3. At present do you have any other sexually transmitted infections?
☐ Yes* ☐ No ☐ Not sure
**Please specify*?.....
.....

4. Do you have any long-standing physical health problems or disability?

☐ Yes* ☐ No ☐ Not sure
**Please specify*?.....
.....

5. How many outbreaks of genital herpes have you had?
☐ first outbreak → GO TO Q.6
☐ two or more outbreaks → GO TO Q.7

6. Please answer Q6 if this is your <u>first outbreak</u> of genital herpes

a)How long did your outbreak last (days)?
.....

b)On the scale below please rate how severe the symptoms were for you ?

0-----1-----2-----3-----4-----5
No Severe
Symptoms Symptoms

PLEASE CONTINUE ON THE NEXT PAGE.

7. Please answer Q7 if you have had <u>two or more outbreaks</u> of genital herpes

a)How many outbreaks have you had in the last year?.....

b)How long do your outbreaks usually last(days)?.....

c)On the scale below please rate how severe the symptoms usually were for you ?

0-----1-----2-----3-----4-----5
No Severe
Symptoms Symptoms

PLEASE CONTINUE ON THE NEXT PAGE.

6.8 Appendix 8) Demographic sheet for normal control participants

Section 1. About you

I am interested in getting a full picture of the people taking part in this research. Please tick and answer the following items as accurately as you can.

Age ..... **Gender** .....

Ethnic identity:
☐ Indian ☐ Pakistani
☐ Bangladeshi ☐ Chinese
☐ Asian (other) ☐ Black (African)
☐ Black (Caribbean) ☐ Black (other)
☐ White (European) ☐ White (Other)

If other (please specify) .....

Employment status:
☐ Full time Employed
☐ Part time Employed
☐ Out of paid Employment
☐ On sickness benefit
☐ Retired
☐ Other .....

Educational level:
☐ Left school at 16
☐ CSE/O level/GCSE
☐ GCSE A level/HNC/HND
☐ University degree
☐ Post graduate degree
☐ Vocational qualification
☐ Other .....

Relationship status:
☐ Single
☐ Co-habiting
☐ Married

Sexual orientation:
☐ Heterosexual ☐ Gay
☐ Lesbian ☐ Bisexual
☐ other (please specify)
.....

Section 2. About your health

Please answer the following questions about your health, as accurately as you can.

1. How many times have you been to see your GP in the 12 months?

☐ None ☐ 1-4
☐ 5-9 ☐ 10 or more

2. Have you received any medical care at a hospital, either as an inpatient or an outpatient, in the last 12 twelve months?

☐ Yes* ☐ No ☐ Not sure

**Please specify?*.....
.....
.....

3. Have you had any sexually transmitted infections in the last 12 months?

☐ Yes* ☐ No ☐ Not sure

**Please specify?*.....
.....
.....

4. Do you have any long-standing physical health problems or disability?

☐ Yes* ☐ No ☐ Not sure

**Please specify?*.....
.....
.....

PLEASE CONTINUE ON THE NEXT PAGE

6.9 Appendix 9) Penn State Worry Questionnaire

PSWQ

Listed below are a number of statements which people have used to describe their worries. Please read each statement and put a circle around the most appropriate number to indicate how typical they are about you.

Do not spend too much time on each statement. There are no right or wrong answers and the first response to each item is often the most accurate.

	PSWQ Items	**Not at all typical of me**				**Very typical of me**
1	If I do not have time to do everything I do not worry about it	1	2	3	4	5
2	My worries overwhelm me	1	2	3	4	5
3	I do not tend to worry about things	1	2	3	4	5
4	Many siuations make me worry	1	2	3	4	5
5	I know I should not worry about things but I just cannot help it	1	2	3	4	5
6	When I am under pressure I worry a lot	1	2	3	4	5
7	I am always worrying about something	1	2	3	4	5
8	I find it easy to dismiss worrisom thoughts	1	2	3	4	5
9	As soon as I finish one task, I start to worry about everything else I have to do	1	2	3	4	5
10	I never worry about anything	1	2	3	4	5
11	When there is nothing more I can do about a concern, I do not worry about it anymore	1	2	3	4	5
12	I have been a worrier all my life	1	2	3	4	5
13	I notice that I have been worrying about things	1	2	3	4	5
14	Once I start worrying I cannot stop	1	2	3	4	5
15	I worry all the time	1	2	3	4	5
16	I worry about projects until they are all done	1	2	3	4	5

6.10 Appendix 10. MCQ: This questionnaire is concerned with beliefs people have about their thinking. Listed below are a number of beliefs that people have expressed. Please read each item and say how much you generally agree with it by TICKING the appropriate response. Please respond to all the items there are no right or wrong answers.

1. Worrying helps me to avoid problems in the future	Do not agree	Agree slightly	Agree moderately	Agree very much
2. My worrying is dangerous for me	Do not agree	Agree slightly	Agree moderately	Agree very much
3. I have difficulty knowing if I have actually done something or just imagined it.	Do not agree	Agree slightly	Agree moderately	Agree very much
4. I think a lot about my thoughts.	Do not agree	Agree slightly	Agree moderately	Agree very much
5. I could make myself sick with worrying.	Do not agree	Agree slightly	Agree moderately	Agree very much
6. I am aware of the way my mind works when I am thinking a problem through.	Do not agree	Agree slightly	Agree moderately	Agree very much
7. If I did not control a worrying thought, and then it happened, it would be my fault.	Do not agree	Agree slightly	Agree moderately	Agree very much
8. If I let my worrying thoughts get out if control, they will end up controlling me.	Do not agree	Agree slightly	Agree moderately	Agree very much
9. I need to worry in order to remain organised.	Do not agree	Agree slightly	Agree moderately	Agree very much
10. I have little confidence in my memory for words and names.	Do not agree	Agree slightly	Agree moderately	Agree very much
11. My worrying thoughts persist no matter how I try to stop them.	Do not agree	Agree slightly	Agree moderately	Agree very much
12. Worrying helps me to get things sorted out in my mind.	Do not agree	Agree slightly	Agree moderately	Agree very much
13. I cannot ignore my worrying thoughts.	Do not agree	Agree slightly	Agree moderately	Agree very much
14. I monitor my thoughts.	Do not agree	Agree slightly	Agree moderately	Agree very much
15. I should be in control of my thoughts all of the time.	Do not agree	Agree slightly	Agree moderately	Agree very much
16. My memory can mislead me at times.	Do not agree	Agree slightly	Agree moderately	Agree very much
17. I could be punished for not having certain thoughts.	Do not agree	Agree slightly	Agree moderately	Agree very much
18. My worrying could make me go mad.	Do not agree	Agree slightly	Agree moderately	Agree very much
19. If I do not stop my worrying thoughts, they could come true.	Do not agree	Agree slightly	Agree moderately	Agree very much
20. I rarely question my thoughts.	Do not agree	Agree slightly	Agree moderately	Agree very much
21. Worrying puts my body under a lot of stress.	Do not agree	Agree slightly	Agree moderately	Agree very much
22. Worrying helps me to avoid disastrous situations.	Do not agree	Agree slightly	Agree moderately	Agree very much
23. I am constantly aware of my thinking.	Do not agree	Agree slightly	Agree moderately	Agree very much
24. I have a poor memory.	Do not agree	Agree slightly	Agree moderately	Agree very much
25. I pay close attention to the way my mind works.	Do not agree	Agree slightly	Agree moderately	Agree very much
26. People who do not worry have no depth	Do not agree	Agree slightly	Agree moderately	Agree very much
27. Worrying helps me cope.	Do not agree	Agree slightly	Agree moderately	Agree very much
28. I imagine having not done things and then doubt my memory for doing them.	Do not agree	Agree slightly	Agree moderately	Agree very much
29. Not being able to control my thoughts is a sign of weakness.	Do not agree	Agree slightly	Agree moderately	Agree very much
30. If I did not worry, I would make more mistakes.	Do not agree	Agree slightly	Agree moderately	Agree very much
31. I find it difficult to control my thoughts.	Do not agree	Agree slightly	Agree moderately	Agree very much
32. Worrying is a sign of a good person.	Do not agree	Agree slightly	Agree moderately	Agree very much
33. Worrying thoughts enter my head against my will.	Do not agree	Agree slightly	Agree moderately	Agree very much

34. If I could not control my thoughts I would go crazy.	Do not agree	Agree slightly	Agree moderately	Agree very much
35. I will lose out in life if I do not worry.	Do not agree	Agree slightly	Agree moderately	Agree very much
36. When I start worrying, I cannot stop.	Do not agree	Agree slightly	Agree moderately	Agree very much
37. Some thoughts will always need to be controlled.	Do not agree	Agree slightly	Agree moderately	Agree very much
38. I need to worry in order to get things done.	Do not agree	Agree slightly	Agree moderately	Agree very much
39. I will be punished for not controlling certain thoughts.	Do not agree	Agree slightly	Agree moderately	Agree very much
40. My thoughts interfere with my concentration.	Do not agree	Agree slightly	Agree moderately	Agree very much
41. It is alright to let my thoughts roam free.	Do not agree	Agree slightly	Agree moderately	Agree very much
42. I worry about my thoughts.	Do not agree	Agree slightly	Agree moderately	Agree very much
43. I am easily distracted.	Do not agree	Agree slightly	Agree moderately	Agree very much
44. My worrying thoughts are not productive.	Do not agree	Agree slightly	Agree moderately	Agree very much
45. Worrying can stop me from seeing a situation clearly	Do not agree	Agree slightly	Agree moderately	Agree very much
46. Worrying helps me to solve problems.	Do not agree	Agree slightly	Agree moderately	Agree very much
47. I have little confidence in my memory for places.	Do not agree	Agree slightly	Agree moderately	Agree very much
48. My worrying thoughts are uncontrollable	Do not agree	Agree slightly	Agree moderately	Agree very much
49. It is bad to think certain thoughts.	Do not agree	Agree slightly	Agree moderately	Agree very much
50. If I do not control my thoughts, I may end up embarrassing myself.	Do not agree	Agree slightly	Agree moderately	Agree very much
51. I do not trust my memory.	Do not agree	Agree slightly	Agree moderately	Agree very much
52. I do my clearest thinking when I am worrying.	Do not agree	Agree slightly	Agree moderately	Agree very much
53. My worrying thoughts appear automatically.	Do not agree	Agree slightly	Agree moderately	Agree very much
54. I would be selfish if I never worried.	Do not agree	Agree slightly	Agree moderately	Agree very much
55. If I could not control my thoughts, I would not be able to function.	Do not agree	Agree slightly	Agree moderately	Agree very much
56. I need to worry in order to work well.	Do not agree	Agree slightly	Agree moderately	Agree very much
57. I have little confidence in my memory for actions	Do not agree	Agree slightly	Agree moderately	Agree very much
58. I have difficulty keeping my mind focused on one thing for a long time.	Do not agree	Agree slightly	Agree moderately	Agree very much
59. If a bad thing happens which I have not worried about, I feel responsible.	Do not agree	Agree slightly	Agree moderately	Agree very much
60. It would not be normal if I did not worry.	Do not agree	Agree slightly	Agree moderately	Agree very much
61. I constantly examine my thoughts	Do not agree	Agree slightly	Agree moderately	Agree very much
62. If I stopped worrying I would become glib, arrogant and offensive.	Do not agree	Agree slightly	Agree moderately	Agree very much
63. Worrying helps me to plan the future more effectively.	Do not agree	Agree slightly	Agree moderately	Agree very much
64. I would be a stronger person if I could worry less.	Do not agree	Agree slightly	Agree moderately	Agree very much
65. I would be stupid and complacent not to worry.	Do not agree	Agree slightly	Agree moderately	Agree very much

Please ensure that you have responded to all items. Thank you.

6.11 Appendix 11) Anxious Thoughts Inventory

ANTI: A number of statements which people have used to describe their thoughts and worries are given below. Read each statement and put a circle around the most appropriate number to indicate how often you have these thoughts and worries.

Do not spend too much time on each statement. There are no right or wrong answers and the first response to each item is often the most accurate.

	AnTI Items	Almost never	Sometimes	Often	Almost always
1	I worry about my appearance	1	2	3	4
2	I think I am a failure	1	2	3	4
3	When looking to the future I give more thought to the negative things than the positive things that might happen to me.	1	2	3	4
4	If I experience unexpected physical symptoms I have a tendency to think the worst possible thing is wrong with me.	1	2	3	4
5	I have thoughts about becoming seriously ill	1	2	3	4
6	I have difficulty clearing my mind of repetitive thoughts	1	2	3	4
7	I worry about having a heart attack or cancer	1	2	3	4
8	I worry about saying or doing the wrong things when among strangers	1	2	3	4
9	I worry about my abilities not living up to other people's expectations	1	2	3	4
10	I worry about my physical health	1	2	3	4
11	I worry that I cannot control my thoughts as well as I would like to	1	2	3	4
12	I worry that people don't like me	1	2	3	4
13	I take disappointments so keenly that I can't put them out of my mind	1	2	3	4
14	I get embarrassed easily	1	2	3	4
15	When I suffer from minor illnesses such as a rash I think it is more serious than it really is	1	2	3	4
16	Unpleasant thoughts enter my head against my will	1	2	3	4
17	I worry about my failures and my weaknesses	1	2	3	4
18	I worry about not being able to cope in life as adequately as others seem to	1	2	3	4
19	I worry about death	1	2	3	4
20	I worry about making a fool of myself	1	2	3	4
21	I think I am missing out on things in life because I worry too much	1	2	3	4
22	I have repetitive thoughts such as counting or repeating phrases	1	2	3	4

Please check that you have responded to all items. Thank you.

6.12 Appendix 12) Thought Control Questionnaire

TCQ Most people experience unpleasant, and/or unwanted thoughts (in verbal and/or picture form), which can be difficult to control. We are interested in the techniques that you **generally** use to control such thoughts. Below are a number of things that people do to control these thoughts. Please read each statement carefully, and indicate how often you use each technique by **circling** the appropriate number. There are no right or wrong answers. Do not spend too much time thinking about each one.

1: never
2: sometimes
3: often
4: almost always

When I experience an unpleasant/unwanted thought:

1.	I call to mind positive images instead	1 2 3 4
2.	I tell myself not to be stupid	1 2 3 4
3.	I focus on the thought	1 2 3 4
4.	I replace the thought with a more trivial bad thought	1 2 3 4
5.	I don't talk about the thought to anyone	1 2 3 4
6.	I punish myself for thinking the thought	1 2 3 4
7.	I dwell on other worries	1 2 3 4
8.	I keep the thought to myself	1 2 3 4
9.	I occupy myself with work instead	1 2 3 4
10.	I challenge the thoughts validity	1 2 3 4
11.	I get angry with myself for having the thought	1 2 3 4
12.	I avoid discussing the thought	1 2 3 4
13.	I shout at myself for having the thought	1 2 3 4
14.	I analyse the thought rationally	1 2 3 4
15.	I slap or pinch myself to stop the thought	1 2 3 4
16.	I think pleasant thoughts instead	1 2 3 4
17.	I find out how my friends deal with these thoughts	1 2 3 4
18.	I worry about more minor things instead	1 2 3 4
19.	I do something that I enjoy	1 2 3 4
20.	I try to reinterpret the thought	1 2 3 4
21.	I think about something else	1 2 3 4
22.	I think more about minor problems I have	1 2 3 4
23.	I try a different way of thinking about it	1 2 3 4
24.	I think about past worries instead	1 2 3 4
25.	I ask friends if they have similar thoughts	1 2 3 4
26.	I focus on different negative thoughts	1 2 3 4
27.	I question the reasons for having this thought	1 2 3 4
28.	I tell myself that something bad will happen if I think the thought	1 2 3 4
29.	I talk to a friend about the thought	1 2 3 4
30.	I keep myself busy	1 2 3 4

6.13 Appendix 13) State Trait Anxiety Inventory

S.T.A.I. (State sub-scale) Y-1

DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then tick the appropriate box to the right of the statement to indicate **how you *feel right now*** that is, ***at this moment***. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you presently feel.

		NOT AT ALL	SOMEWHAT	MODERATELY SO	VERY MUCH SO
1	I feel calm				
2	I feel secure				
3	I am tense				
4	I feel strained				
5	I feel at ease				
6	I feel upset				
7	I am presently worrying over possible misfortunes				
8	I feel satisfied				
9	I feel frightened				
10	I feel comfortable				
11	I feel self-confident				
12	I feel nervous				
13	I am jittery				
14	I feel indecisive				
15	I am relaxed				
16	I feel content				
17	I am worried				
18	I feel confused				
19	I feel steady				
20	I feel pleasant				

6.13 Appendix 13) State Trait Anxiety Inventory

S.T.A.I. (Trait sub-scale) Y-2

DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then tick the appropriate box to the right of the statement to indicate **how you *generally feel***. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

		ALMOST NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS
21	I feel pleasant				
22	I feel nervous and restless				
23	I feel satisfied with myself				
24	I wish I could be as happy as others seems to be				
25	I feel like a failure				
26	I feel rested				
27	I am "calm, cool and collected"				
28	I feel that difficulties are piling up so that I cannot overcome them				
29	I worry too much over something that doesn't really matter				
30	I am happy				
31	I have disturbing thoughts				
32	I lack self-confidence				
33	I feel secure				
34	I make decisions easily				
35	I feel inadequate				
36	I am content				
37	Some unimportant thoughts runs through my mind and bothers me				
38	I take disappointments so keenly that I can't put them out of my mind				
39	I am a steady person				
40	I get in a state of tension or turmoil as I think over my recent concerns and interests				

6.14 Appendix 14) Recurrent Genital Herpes Quality of Life instrument (RGHQoL)

On the following pages you will find some statements which have been made by people who have herpes. Each statement is followed by four alternative responses. Please choose the response that applies best to you **at the moment** and put a tick in the box next to it.

Please answer each of the 20 statements on the following pages. It will only take you a few minutes Remember to tick only one of the responses for each of the statements.

1. Herpes makes it difficult for me to plan ahead
Yes, very difficult ☐
Yes, quite difficult ☐
Yes, a little difficult ☐
No, not at all difficult ☐

2. I worry that sex will trigger an outbreak
Yes, I worry a great deal ☐
Yes, I worry quite a lot ☐
Yes, I worry about it a little ☐
No, I don't worry about it at all ☐

3. I feel insecure about personal relationships
Yes, very insecure ☐
Yes, quite insecure ☐
Yes, a little insecure ☐
No, not at all insecure ☐

4. It is difficult to forget that I have herpes
Yes, it's very difficult ☐
Yes, it's quite difficult ☐
Yes, it's a little difficult ☐
No, it's not at all difficult ☐

5. Herpes affects my self confidence
Yes, very much ☐
Yes, quite a lot ☐
Yes, a little ☐
No, not at all ☐

6. I worry about getting into stressful situations
Yes, I worry about this a great deal ☐
Yes, I worry about this quite a lot ☐
Yes, I worry about this from time to time ☐
I rarely or never think about it ☐

7. Herpes is affecting my sex life
Yes, very much ☐
Yes, quite a lot ☐
Yes, a little ☐
No, not at all ☐

8. Herpes makes me feel dirty
Yes, very much ☐
Yes, quite a lot ☐
Yes, a little ☐
No, not at all ☐

9. I worry that I am going to have an attack of herpes
Yes, it worries me almost all the time ☐
Yes, it worries me a lot of the time ☐
Yes, it worries me occasionally ☐
I rarely or never worry about it ☐

10. I feel ashamed of having herpes
Very much so ☐
Quite a lot ☐
A little ☐
Not at all ☐

11. I get depressed about having herpes
Very much so ☐
Quite a lot ☐
A little ☐
No, not at all ☐

12. I find it difficult to live with my herpes
Yes, very difficult ☐
Yes, quite difficult ☐
Yes, a little difficult ☐
No, not at all difficult ☐

13. I worry about giving herpes to someone
Yes, I worry about it a great deal ☐
Yes, I worry about it quite a lot ☐
Yes, I worry a little ☐
No, I don't worry about it at all ☐

14. Herpes is making my life a misery
Very much so ☐
Quite a lot ☐
A little ☐
Not at all ☐

PLEASE CONTINUE ON THE NEXT PAGE

6.14 Appendix 14) Recurrent Genital Herpes Quality of Life instrument (RGHQoL)

15. I worry about people I know finding out I have herpes

Yes, I worry about it a great deal ☐
Yes, I worry about it quite a lot ☐
Yes, I worry a little ☐
No, I don't worry about it at all ☐

16. I feel isolated from other people

Very much so ☐
Quite a lot ☐
A little ☐
Not at all ☐

17. I feel angry about having herpes

Yes, very angry ☐
Yes, quite angry ☐
Yes, a little angry ☐
No, not at all angry ☐

18. I worry that people will reject me if they know I have herpes

Yes, I worry about it a great deal ☐
Yes, I worry about it quite a lot ☐
Yes, I worry a little ☐
No, I don't worry about it at all ☐

19. I become tense when someone touches me

Yes, very tense ☐
Yes, quite tense ☐
Yes, a little tense ☐
No, not at all tense ☐

20. It is difficult for me to show affection

Yes, very difficult ☐
Yes, quite difficult ☐
Yes, a little difficult ☐
No, not at all difficult ☐

Please go back to the beginning and make sure that you have ticked one response for each statement.

PLEASE CONTINUE ON THE NEXT PAGE

6.15 Appendix 15) Table 9. Kendall T correlation co-efficients within the RGH group (n=41)

Measures	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*
1. PSWQ																
2. STAI-T	.50†															
3. STAI-S	.47†	.64†														
4. AnTI-S	.39†	.55†	.38**													
5. AnTI-H	.34**	.41†	.34**	.35**												
6. AnTI-M	.61†	.51†	.48†	.51†	.48†											
7. MCQ-Pb	.19	.18	.05	.26*	.15	.36**										
8 MCQ-Ud	.53†	.47†	.44†	.43†	.34**	.63†	.26*									
9. MCQ-Mce	.11	.11	.07	.21	-.04	.21	.08	.22								
10. MCQ-Spr	.21*	.33**	.19	.48†	.20	.42**	.39**	.45†	.28*							
11. MCQ-Csc	.12	-.01	.07	.04	.03	.19	.08	.22	.08	.25**						
12. TCQ-D	-.17	-.29	-.09	-.03	.15	-.12	.00	-.17	.05	.02	-.17					
13. TCQ-P	.28*	.29*	.21	.26*	.39**	.40**	.13	.41**	.04	.37**	.09	.14				
14. TCQ-W	.20	.27*	.22	.19	.33**	.40**	.31*	.24*	.03	.13	.04	.00	.43**			
15. TCQ-R	-.04	-.01	-.04	.05	.11	-.06	.00	-.02	.01	.10	.28*	.35**	.11	-.04		
16. TCQ-Sc	-.04	-.03	.04	-.08	.22	-.02	-.08	.01	-.07	-.14	.12	.26*	.09	-.02	.24	
17. RGHQoL	-.30**	-.33†	-.37†	-.38†	-.31**	-.31**	-.15	-.38†	-.12	-.44†	-.28*	.13	-.25*	-.21	.02	.20

Note: †p<.001, **p<.01, *p<.05.

6.16 Appendix 16 Ethical approval letters (see overpage)

Leicestershire NHS
Health Authority

Melanie Sursham
Direct Dial 0116 2588610

Gwendolen Road
Leicester
LE5 4QF

Tel: 0116 2731173
Fax: 0116 2588577
DX 709470 Leicester 12

30 April 2001

Please quote ref no 6087

Mr N Wilkinson
Trainee Clinical Psychologist
Hadley House
Leicester General Hospital

Dear Mr Wilkinson

Project No 6463 Worry, meta-cognition, coping and outcome in patients with genital herpes, attending a sexually transmitted diseases clinic – our ref no 6087

I have received your completed and signed Protocol Amendments form dated 10 April 2001 together with revised documents including letter of invitation, Patient Information Sheet (Ref No PSI 18.9.00) and Consent Form relating to the above study.

Could you please clarify for the Committee how many controls with chlamydia will be recruited?

On behalf of the Leicestershire Research Ethics Committee, and by Chairman's action, approval is given to this amendment and the revised documents submitted.

Yours sincerely

M Sursham

P G Rabey pp.
Chairman
Leicestershire Research Ethics Committee
(Signed under delegated authority)

(NB All communications relating to Leicestershire Research Ethics Committee must be sent to Leicestershire Health)

Ethics Office location: 307 Western Bank, Royal Hallamshire Hospital, [illegible]op Road, Sheffield S10 2JF
Tel & Fax No *Enquiries (0114) 271 2304 New Registrations 271 1789*
E-mail: External: Kate.Khoaz@sth.nhs.uk

Chairman: Professor C J Taylor/ Administrator: Ms K A Khoaz

[redacted]

SOUTH SHEFFIELD RESEARCH ETHICS COMMITTEE

CJT/ND

Always quote the relevant SSREC Ref[illegible]mber

25/04/2001

Mr. N. Wilkinson
Trainee Clinical Psychologist
62 Paget Road
Leicester
LE3 5HL

Dear Mr. Wilkinson

Ref.: SS/00/412 - Worry, Metacognition, Coping and Outcome in Patients with Genital Herpes Attending a Sexually Transmitted Disease Clinic

The above study was seen on 01/03/2001 and I can now confirm unreserved Ethics Committee approval subject to the following terms and conditions:

1. That you familiarise yourself with the ICH Guidelines laid down for the conduct of human experiments.
2. It is understood that approval of the investigation does not absolve you from total responsibility for the safety and well being of the subjects.
3. No deviations from or changes of the protocol will be initiated without prior written approval of an appropriate amendment. (*except when necessary to eliminate immediate hazards to the subjects or when the change(s) involve only logistical or administrative aspects of the trial).* Amendments should be reported in a standardised format giving indication of the local implications as well as a brief outline of what the amendment(s) consist of **(outline attached)** and its significance or otherwise in terms of the overall protocol.
4. That you should promptly report any changes increasing the risk to subjects; or new information that may affect adversely the safety of the subjects or conduct of the trial. All **Unexpected Serious** adverse drug reactions **(SADR's) should be reported** in a standardised format **(outline attached)** within 7-15 days as specified in the EU Directive. These should be submitted with relevant interpretation from the **investigator and sponsor** on the significance for the conduct of the trial. *(an acknowledgement and/or opinion as to whether approval will continue will be sent within a few days following review by the Ethics Committee)*
5. That should any untoward event occur during the conduct of the study the Chairman of the Committee or failing this, the Administrator be informed immediately. **Reports of progress shall be submitted at yearly intervals.**

The documents approved were:

Protocol: Received 07/02/01 ☑
Information sheet version II: Received 19/03/01 ☑
Consent form: Received 07/02/01 ☑

I can confirm that this Ethics Committee is organised and operates according to GCP and the applicable laws and regulations

Yours sincerely

Professor C Taylor
Chairman