

PSYCHOLOGICAL ADJUSTMENT TO LOWER LIMB AMPUTATION

Thesis submitted for the degree of
Doctor in Clinical Psychology
at the University of Leicester

by

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Psychological Adjustment to Lower Limb Amputation
Rachel Atherton

ABSTRACT

Rationale: Clinical reports have indicated that a significant number of lower limb amputees experience psychological adjustment problems. Research has demonstrated a relatively high prevalence of depression in this population but there has been inadequate attention to other aspects of adjustment. This study aimed to identify variables associated with increased psychological distress. Particular attention was given to cognitive models of emotion which postulate a key role for self-consciousness and appearance-related beliefs.

Methods: A cross-sectional correlational design was employed. Participants were 67 lower limb amputees. Measures gathered information about different types of self-consciousness, appearance-related beliefs, psychological adjustment, and a range of amputation-related factors including activity restriction, prosthesis satisfaction, phantom and residual limb pain and other medical issues.

Results: The prevalence of anxiety was 29.9% and the prevalence of depression was 13.4%. Activity restriction, prosthesis satisfaction and appearance-related beliefs were associated with both distress and psychosocial adjustment difficulties. Public self-consciousness was associated with distress and psychosocial adjustment difficulties but this was not the case for private self-consciousness. Psychological distress was more common amongst those who reported amputation-related pain or additional health problems. Distress was not influenced by age, time since amputation, cause of amputation or level of amputation.

Implications: Clinicians need to monitor amputees for distress over a long time period. It is particularly important to assess for anxiety. Interventions that target appearance-related beliefs may be of benefit to this population. Limitations of the current study are addressed and areas for further research are highlighted.

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1.1 The role of Psychology in health and disability

Over the last three decades the importance of psychological processes in the experience of health and illness has been increasingly acknowledged (Edelmann, 1994). This was recognised by the emergence of the term 'health psychology' in the mid 1970's to describe the application of psychological theory and practice to physical health problems. Research areas within health psychology are wide-ranging, for example, attempts have been made to delineate factors which determine a person's health or which influence their ability to cope with illness. Providing support to patients who need help in coping with the stresses connected to their physical health problem(s) is vital in order to alleviate both distress and undue use of overstretched health services.

One specialism within health psychology is that of physical disability. People with physical disabilities face a variety of challenges in day-to-day life and often have a poor quality of life. Wright (1983) reviewed these issues in depth and drew attention to the low status of disabled people within society, highlighting the discrimination which is often experienced on a daily basis. Despite legislation to prevent such disadvantages (e.g. The Disability Discrimination Act; Department for Education and Employment, 1995), it remains true that physical disabilities which give rise to decreased mobility may have ramifications for job prospects and may also constitute barriers that deny access to the opportunity to partake in general life in the community. Consequences of such disadvantages can include diminished financial security and a sense of isolation and frustration. Wright suggested that people who were born able-bodied and who acquire a physical disability due to an accident or health problems often go through a period of mourning during which they have to work through feelings of resentment, inferiority, guilt and loneliness. Furthermore they may have concerns about being a burden, doubts about whether they will still be loved and accepted, worries about the future and how they will manage, and concern that they will be left behind. There is a role for clinical psychology in helping people come to terms with these issues and associated feelings.

An area of acquired physical disability that has received relatively little research attention is that of lower limb amputation. To date most of the research about this population has been devoted to investigating pain experience and developing interventions for pain

management and less attention has been given to psychological adjustment post amputation.

1.2 Overview of amputation

1.2.1 Definition

The definition of a lower limb amputation used in the current study is: The complete and permanent removal of part of the lower limb including at least the foot (i.e. the phalanges and metatarsals). Note this definition excludes those who have congenital absence of limb(s). Lower limb amputation is usually classed as either below the knee (BK) or above the knee (AK). The choice of position of level of amputation depends on a variety of factors including the general condition of patient, severity of pain, pathology being dealt with, extent of infection and local tissue involvement (Ham & Cotton, 1991).

1.2.2 Reasons for amputation

Lower limb amputation is carried out for a wide range of reasons including vascular disease, diabetes, trauma, tumour or infections such as meningitis. In the UK the most common reason for lower limb amputation is Peripheral Vascular Disease (PVD), particularly atherosclerosis (Ham & Cotton, 1991; The Global Lower Extremity Amputation Study Group, 2000). In PVD patients are not able to sustain adequate blood circulation to their legs. In these circumstances the onset of gangrene, or the failure of earlier corrective vascular surgery may necessitate amputation if the patient is to recover fully. PVD is frequently a complication of Diabetes Mellitus and thus many individuals attempting to cope with losing a limb are likely to be coping with other illness conditions as well. As PVD is a generalised degenerative condition, it is not surprising that many of these patients subsequently require another amputation. Indeed the risk of needing an amputation of the contralateral leg following a unilateral amputation is 15-20% and approximately 40% two and four years after the amputation, respectively (Cutson & Bongiorno, 1996).

1.2.3 Prevalence

In a recent epidemiological study The Global Lower Extremity Amputation Study Group (2000) surveyed amputation data from four cities in the UK and found incidence rates ranging from 5.0-26.2 per 100 000 per year. Incidence was substantially higher in men

than women with a ratio of roughly two males to one female. Furthermore incidence rose steeply with age; around two-thirds of amputations occurred in patients over 60 years. A recent American study found that despite advances in medical treatments, there is no evidence that major amputation rates have decreased over the last decade (Feinglass et al., 1999). Indeed given the increasing proportion of elderly people in the population (Mann, 1995), and the increasing incidence of diabetes (King, Carroll, Newton & Dornan, 2002), it is perhaps more likely that amputation rates will rise in the future.

1.2.4 Challenges faced by amputees

Although it could be argued that amputation should be viewed as a constructive procedure leading to artificial limb fitting and a return to active functioning (Ham & Cotton, 1991), it is important to acknowledge that surviving a lower limb amputation means facing major physical challenges in terms of loss of functional ability and being fitted for and learning to use a prosthetic limb.

Following an amputation, patients are usually referred to a prosthetist, a health professional who specialises in the creation and fitting of artificial limbs. Proper rehabilitation training is required to learn to use the prosthesis in order to engage in daily tasks such as walking. Walking with a prosthesis requires significantly more physical energy than walking with both natural limbs. It has been recognised that the energy expenditure needed to walk with an above knee amputation is considerably higher than walking with a below knee amputation and that bilateral amputation is even more physically challenging (Day, 1981; Pinzur et al., 1992). Given the high physical demands it is perhaps not surprising that a significant proportion of people are unable to use a prosthesis for day-to-day functioning. Indeed a review of prosthetic use among those with a lower limb amputation showed that the percentage of “successful prosthetic users” varies considerably from 46-96% (Gallagher & MacLachlan, 2000).

For those of working age, decreased physical abilities relating to the amputation can have significant implications for employment. A recent UK study found that following amputation, a large proportion of working age amputees become unemployed or move into lower skilled, lower paid jobs (Hill, Niven, Knussen & McCreath, 1995). This in turn can give rise to financial pressures, isolation and loss of self-esteem (English, 1989).

In addition to the physical adaptation needed to wear a prosthesis, there is also a need for the individual to adjust to their changed appearance. Indeed it could be argued that this is a double challenge as they need to get used to their body both with and without their prosthesis. Issues relating to body image will be discussed in more detail in section 1.4.3.4 below.

In terms of the social ramifications of amputation there is evidence that intimate relationships may be threatened following amputation. English (1989) reported that marital breakdown is not uncommon and several studies have found that amputees report decreased levels of sexual activity (Akesode & Iyang, 1981; Bodenheimer, Kerrigan, Garber & Monga, 2000).

In summary, in most cases the predominant experience of the amputee is one of loss, not only of the obvious loss of limb, but also of resulting losses in function, career and relationships (Waites & Zigmond, 1999). Given these many challenges, it is not surprising that adjusting to an amputation can precipitate psychological distress.

1.3 Psychological adjustment to amputation

This section initially outlines the different kinds of psychological problems that have been noted in the amputee population and reviews the few studies that have attempted to delineate the prevalence of such problems, with a particular focus on depression. The literature indicating that adjustment problems are a long-term issue is then reviewed and reasons why psychological adjustment merits further research attention are given.

1.3.1 Previous research on psychological adjustment

It has long been acknowledged that the psychological consequences of amputation can be just as traumatic as the physical loss itself (e.g. Randall, Ewalt & Blair, 1945; Nobel, Price & Gilder, 1954). Indeed several authors have suggested that losing a limb evokes many of the same emotions that accompany bereavement (Parkes, 1972, 1975; English, 1989). An early clinical report suggested that 50% of amputees required some type of psychological intervention to facilitate adjustment (Caine, 1973).

Research has found that a sizable minority of amputees experience clinically significant psychological adjustment problems with common difficulties being anxiety (Shukla, Sahu, Tripathi & Gupta, 1982; Whyte & Niven, 2001), social isolation (Thompson & Haran, 1983) and guilt, fear and anger (English, 1989). Other emotional reactions include grief, relief, regret and depression.

Levels of depression in amputees have been particularly well investigated. In an early American study, Kashani and colleagues interviewed 65 amputees attending an outpatient clinic. The patient sample (mean age 54.9 yrs) appeared representative of the amputee population in terms of demographics and cause and level of amputation when compared to recent epidemiological data (The Global Lower Extremity Amputation Study Group, 2000). They found a 35% prevalence of major depressive disorder using the criteria stated in the Diagnostic and Statistical Manual of Mental Disorders (*DSM-III*; American Psychiatric Association, 1980) (Kashani, Frank, Kashani, Wonderlich, & Reid, 1983). This prevalence rate was high in comparison to a general population prevalence of 4.3% when assessed in the same way (Weissman & Myers, 1978). They also asked participants to complete the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) and reported that the mean for sample was 6.4, which is below the cut-off of 10 used to detect caseness. Unfortunately Kashani et al. did not provide a breakdown of their data so it is not possible to identify how many individuals fell within the clinical range on this measure. However in a subsequent paper reporting different aspects of the same study they stated that the range of scores was 0-29 and that the median BDI score was 10 which indicates that at least 50 % of their sample scored in at least the mildly depressed range on this measure (Frank et al., 1984). This result must be interpreted with caution however as the BDI tends to overestimate levels of depression amongst physically ill people due to certain items which do not distinguish the effects of physical illness from mood disorders.

Two other studies have used the BDI to investigate levels of depression in amputees. A recent Scottish study (Whyte & Niven, 2001) which focussed on lower limb amputees of working age who experienced phantom limb pain found that 42% scored in the clinical range, although only 15% fell within the moderate to severe range. However, in contrast a recent American study surveyed 30 men with lower limb amputations aged between 32-79

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and found that levels of depression were comparable to other outpatient adult populations (Bodenheimer et al., 2000).

In two recent American studies, Rybarczyk and colleagues investigated depression levels in the amputee population using the Centre for Epidemiologic Studies-Depression Scale (CES-D; Radloff, 1977) and found a clinical depression rate of 23% (Rybarczyk et al., 1992) and 28% (Rybarczyk, Nyenhuis, Nicholas, Cash, & Kaiser, 1995). This tool was also used in another American study carried out by Williamson, Schulz, Bridges & Behan (1994). In their sample of mainly lower limb amputees, 20.8% scored above the cut-off used on this measure to detect depression. These results compare to a 10.7% prevalence rate in a community sample of older adults (age 55+) tested with the same instrument and cut-off score (Phifer & Murrell, 1986 cited in Rybarczyk et al., 1992).

Recent UK studies have tended to use The Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983) to assess levels of depression as scores obtained on this measure are not considered to be influenced by physiological symptomology. In a mixed sample of upper and lower amputees (N=93), Fisher & Hanspal (1998) found that only one individual fell in the clinical range for depression. However in stark contrast another study which focussed on lower limb amputees aged 60 and over who had had their amputation within the last 30 months, reported that 45% fell within the clinically depressed range (Carter, 2000). Whilst studies of prevalence rates of depression consistently suggest that it is more common in older adults, the figure reported by Carter was far higher than the 10-15 % prevalence rate found in an elderly population in the community (Baldwin, 1995).

It would therefore appear that most studies which have used a range of different measures have tended to find that rates of depression amongst amputees are considerably higher than expected in the general population. Indeed it is important to bear in mind that prevalence studies based on the general population usually consist of equal numbers of men and women whereas amputee samples typically consist of more men than women. As research has consistently found that women are more likely to experience depression than men (e.g. Bradley, 1994), it is probably fair to assert that even those few amputee studies which report relatively low depression prevalence rates are actually detecting a higher prevalence rate than would be obtained in a matched sample drawn from the general population.

One issue that has not yet been investigated is how self-ratings of psychosocial adjustment to amputation correlate with levels of distress detected on more global and well-standardised measures such as the HADS. This has recently become possible following the development of the Trinity Amputation and Prosthesis Experience Scales (TAPES) (Gallagher & MacLachlan, 2000) which includes a 15-item Psychosocial Adjustment section that can further be broken down into three 5-item subscales (General Adjustment, Social Adjustment and Adjustment to Limitation). It is likely that there would be a negative association between self-reported psychosocial adjustment and depression and anxiety as assessed by the HADS.

1.3.2 Longevity of psychological problems

Whilst intuition suggests that the greater the time after an acquired disability, the more likely the person will be able to cope effectively, this is challenged by clinical reports that people often experience an initial sense of relief at the time of amputation and only later experience grief over their losses (e.g. Frierson & Lippmann, 1987). This is perhaps not surprising as many amputations arise from conditions which have a longstanding negative impact on quality of life (e.g. diabetic foot ulcerations may have required prolonged bed rest, or vascular problems may have resulted in years of chronic pain). In these circumstances the quality of life may actually improve following an amputation. This ties in with the research finding that in a study of older adults with an amputation, only 23% of individuals indicated that their period of greatest emotional upset occurred immediately following the actual amputation (MacBride, Rogers, Whyllie, & Freeman, 1980). The remainder were evenly divided between being most upset before the amputation or at a later stage in the rehabilitation process. Similarly Parkes (1975) found that few amputees showed psychological disturbance in the two months following the amputation, but over a third had difficulties thirteen months after the amputation.

Studies examining time since amputation have found either no connection or only a small correlation with adjustment. Thompson & Haran (1983) compared an early and established group of individuals who had had an amputation (recent amputation and 1-2 yrs after amputation) and reported that there was a 47% and 44% risk of psychiatric illness respectively. Several other studies have also reported that time since amputation was not significantly associated with distress (Rybarczyk et al., 1992; Williamson et al., 1994;

Fisher & Hanspal, 1998). Indeed in a study where the average post-amputation time was 17 years, the depression rate was 28% which the authors argued indicated that depression is both a short-term and a long-term adjustment problem following a leg amputation (Rybarczyk et al., 1995).

1.3.3 Reasons why psychological adjustment merits further research attention

The high prevalence of depression in the amputee population is an issue that warrants further attention for a number of reasons. Firstly, depression has been shown to be a pivotal factor in the successful rehabilitation of orthopaedic disorders (Mossey, Mutran, Knott, & Craik, 1989). Secondly, it represent a significant public health problem because it has been shown amongst physically ill individuals that depression may result in increased hospitalisation, increased demands on families, health and social welfare resources (Freidland & McColl, 1992), and compromise functional recovery and rehabilitation (Ebrahim, Barer & Nouri, 1987; Robinson, Starr, Lipsey, Rao & Price, 1984; Schubert, Taylor, Lee, Mentari & Tamaklo, 1992). Furthermore it has been argued that only when psychological issues are resolved are amputees likely to be able to derive full benefit from the prosthetic service and reconstruct their lives from that point and go forwards to regain their self-esteem (English, 1989).

In summary, it is clear that whilst a substantial percentage of amputees adapt quite well to their disability, a sizeable minority have considerable and enduring psychological adjustment difficulties. In order to design interventions to assist these individuals there is a need for a better understanding of the factors that may influence adjustment.

1.4 The search for potential mediating factors

The wide variation in psychological adjustment following amputation has led to a search for potential mediating factors. The literature relating to patient characteristics, disability variables and psychosocial factors will be reviewed in this section.

1.4.1 Patient characteristics

1.4.1.1 Sex of patient.

In samples taken from the general population, depressive symptomatology is usually found to be more prevalent amongst women than men (Bradley, 1994; Baldwin, 1995). As such it

is not surprising that a number of researchers have hypothesised that women who have an amputation are more likely to develop depression than men who undergo the same procedure. However the results of such investigations are mixed. For example, the majority of studies have failed to find a relationship between gender and depression as measured by the CES-D scale (Rybarczyk et al., 1992, 1995; Williamson et al., 1994). In contrast, Kashani et al. (1983) found that women with amputations were more likely to be depressed than men with amputations when assessed using either a clinical interview or the BDI.

1.4.1.2 Age.

In general population studies using a range of different methodologies it has been found that prevalence rates of depression increase with age (e.g. Weissman & Myers, 1978; Baldwin, 1995). However it has been suggested that older adults may not have as strong a reaction to amputation as younger adults because they view the amputation and attendant mobility and body image changes as an undesirable, but relatively 'timely' (i.e. somewhat normal for their age) (Rybarczyk, Nicholas, & Nyenhuis, 1997). Results concerning the impact of age on adjustment to amputation are mixed. Kashani and colleagues used the BDI and clinical interviews and found that older adults (over 65) were more depressed than younger adults (under 65) during the first year and a half after an amputation but the reverse was true when participants were assessed at a greater interval after an amputation (Kashani et al., 1983; Frank et al., 1984). However it is of note that this result could be contaminated by the fact that there was a significant difference in cause of amputation between these two groups, with most of the older amputees having had an amputation because of vascular disease whilst most of the younger amputees had had their amputations because of other reasons, commonly accidents. Williamson et al. (1994) found that there was a negative correlation between age and level of depression. In contrast, Rybarczyk and colleagues found no correlation between age and overall adjustment to amputation (Rybarczyk et al., 1992; Rybarczyk et al., 1995).

1.4.1.3 Presence of other health conditions.

Research across a range of different health problems and types of disabilities consistently suggests that these groups are more likely to experience psychological distress than healthy controls taken from the general population (e.g. Herrmann, 1997). It is therefore hypothesised that amputees who report other health problems in addition to their amputation are more likely to report psychological distress.

In summary, given these contradictory findings further exploratory research using different measures is warranted.

1.4.2 Disability variables

1.4.2.1 Cause of amputation.

As discussed above, amputation may be precipitated by a variety of medical factors. It is reasonable to propose that the cause of amputation could play a role in adjustment, as the circumstances surrounding amputation are likely to vary depending on the reason for amputation. For example, patients whose amputation is due to peripheral vascular disease usually have the opportunity for ‘anticipatory grief’ during the months or years preceding an amputation when they are given increasingly dire warnings by their doctors regarding the possibility of needing an amputation. In contrast, patients whose amputation arises from trauma or tumour rarely have this time. Furthermore, for an individual who undergoes an amputation after experiencing years of vascular-related chronic pain, the amputation may be seen as a release and quality of life may subsequently improve. For a previously fit and healthy individual who loses their limb in an accident, quality of life would almost certainly decrease. However, despite these differences, research which has investigated the impact of the reason for amputation, has consistently found that no particular medical cause of amputation stands out as a predictor of poor adjustment (e.g. Kashani et al., 1983; Rybarczyk et al., 1992, 1995; Williamson et al., 1994).

1.4.2.2 Level of amputation.

It has long been recognised that above knee (AK) amputation poses considerably more severe challenges in rehabilitation than below knee (BK) amputation. The level of amputation could therefore compromise the individual’s psychological well-being because it has been reported that the ability to carry out normal activities is crucial to psychological well-being of medically compromised individuals (Williamson, 1995). Yet despite BK amputations having better implications for prosthetic use and hence functional ability, researchers have not found the expected relationship between type of amputation and psychological distress (Kashani et al., 1983; O’Toole, Goldberg, & Ryan, 1985; Williamson et al., 1994; Rybarczyk et al., 1995). This finding that there does not appear to be a connection between level of amputation and adjustment is in line with the disability

literature which suggests that objective measures of physical impairment are poor predictors of mental health (e.g. Bieliauskas & Glantz, 1989).

It is interesting to note that the studies discussed above have expected to find that different levels of amputation result in different psychological adjustment based on the implicit assumption that level of amputation is a direct indicator of functional limitation. To the author's knowledge only one study has directly assessed how self-rated activity restriction (e.g. self-care, visiting friends and doing household chores) correlates with psychosocial adjustment. In their American sample Williamson et al. (1994) used the 9-item Activity Restriction Scale (Williamson & Schulz, 1992a, cited in Williamson et al., 1994) which had acceptable psychometric properties. The mean score in their sample indicated that the average participant perceived his or her activities as at least somewhat restricted by the amputation. They also found a significant positive correlation between restriction of normal activities and symptoms of depression as measured by the CES-D. It is important to establish if this finding could be replicated using other measures. It is anticipated that higher levels of self-reported activity restriction would be associated with higher levels of psychosocial adjustment problems and greater distress.

1.4.2.3 Pain.

Given that prolonged pain can impair general functioning, ability to work, social relationships and emotional adjustments it is not surprising that this area has received considerable research attention. In amputation there are two main sources of pain; Phantom Limb Pain (PLP) and Residual Limb Pain (RLP).

Phantom limb sensation, that is the experience of persisting sensory perceptions after limb amputation or disconnection, was first described by the French doctor Ambroise Paré in 1551. Later, in 1872, Dr Wier Mitchell noted that phantoms were often painful, and he coined the name phantom limb pain (PLP) (cited in Shukla et al., 1982). PLP is generally of an episodic nature but it can be continuous and it is commonly described as a crushing, burning or shooting pain which sometimes resembles the pain experienced prior to amputation (Shukla et al., 1982). The phantom is often described as being in a cramped or unnatural posture which gives rise to pain, for example a phantom hand is commonly experienced as tightly clenched with fingernails digging into the palm (Ramachandran, Rogers-Ramachandran & Cobb, 1995).

Reports suggest that PLP is extremely common, being experienced by between 31-85% of amputees (Jensen, Krebs, Nielsen & Rasmussen, 1985; Hill, Niven & Knussen, 1995; Nikolajsen, Ilkjaer, Krøner, Christensen, & Jensen, 1997; Fisher & Hanspal, 1998). Some studies report that the frequency and duration of attacks of PLP decreases over time (Jensen et al., 1985), whilst other researchers have found that the pain tends to get worse and remains a long-term problem for the majority of amputees (Bakal, 1979). Indeed one study reported that more than 70% of amputees continued to experience PLP of considerable intensity as long as 25 years after amputation (Sherman, Sherman, & Parker, 1984).

Given that PLP is experienced by such a large number of amputees there is a need for greater understanding of the part psychological and emotional factors play. Katz & Melzack (1990) found no significant difference in standardised tests of psychological dysfunction between patients who experienced phantom pain and those who did not. They concluded that the pain was more likely to vary with the experience of pre-amputation pain, even retaining many of its characteristics. Similarly both Fisher & Hanspal (1998) and Carter (2000) found no relationship between the experience of pain and emotional distress as assessed by the HADS. Furthermore, in a recent Scottish study, Whyte & Niven (2001) found that psychological distress ('somatic symptoms', 'anxiety and insomnia' and 'social dysfunction') as measured by the General Health Questionnaire 28 (GHQ-28; Goldberg & Hillier, 1979) was not related to the intensity of PLP experienced by working aged adults. Furthermore they found that depression, as measured by the BDI, explained only a very small proportion (4%) of the variance in PLP. Together these studies suggest that PLP and emotional distress were not related. However other studies have demonstrated that PLP has strong correlations with measures of adjustment including depression (e.g. Pucher, Kicking & Frischenschlager, 1999; Lindesay, 1985). Due to the conflicting results this is an area which would benefit from further investigation using different measurement methods.

Residual limb pain is pain experienced at the site of an extremity amputation. This can be exacerbated by a poorly fitting prosthesis. Whilst anecdotal clinical reports suggest such pain is common in the early post-operative stage, few studies have identified the prevalence of RLP and indeed some studies have not differentiated between RLP and PLP.

Jensen et al. (1985) found that in their sample, 57% reported RLP 8 days after surgery; 22% after 6 months but only 10% after 2 years. In contrast a more recent study found that 76% of a sample with a mean of 18 years post amputation experienced RLP (Smith et al, 1999, cited in Gallagher, Allen & MacLachlan, 2001). To the author's knowledge, only one study has investigated the relationship between RLP and psychological distress. In this study the experience of residual limb pain (RLP) was found to be related to both anxiety and depression (Sriwatanakul, Kelvie & Lasagne, 1982). It would be useful to know if this result could be replicated.

1.4.2.4 Perceived health.

In the general population, perceived health has been repeatedly linked to indices of psychological adjustment, such as subjective well-being (Stock, Okun, & Benin, 1986). Only one study was found which explored this potential relationship amongst amputees and in their US study, Rybarczyk and colleagues found that perceived health did correlate with level of depression as measured by the CES-D (Rybarczyk et al., 1992). It is important to establish if this is the case using other measures and in the UK. Previous research has found that single-item self-ratings of health are highly predictive of scores on larger self-report measures of health (Stewart, Hays & Ware, 1988). Self-ratings of health would be expected to be negatively associated with measures of distress.

1.4.2.5 Prosthesis satisfaction.

Clinical reports suggest that often the time most likely to precipitate psychological distress is when the individual is fitted with a prosthesis and subsequently discovers that it does not function as he or she had hoped (Rybarczyk, Szymanski & Nicholas, 2000). Breakey (1997) highlights that in recent years there has been a lot of media attention devoted to amputees undertaking significant physical challenges such as climbing mountains (e.g. Norman Croucher) or running in marathons. Furthermore the former model, Heather Mills, is often seen in the press and is very open about the fact that she has had a below knee amputation. This increased awareness may lead people to have very high expectations from their prosthesis and if these expectations are not met, distress may result.

Expectations regarding the prosthesis fall within two main categories; hopes regarding functioning and expectations about the aesthetic aspects of the limb and the extent to which it will 'blend in'. It has been asserted that generally, women are concerned with creating an

illusion of an intact body surface, whereas men are concerned with the effective restoration of function (Parkes & Napier, 1970).

Only one study has investigated the impact of prosthesis satisfaction on psychological distress. Williamson et al. (1994) reported the use of a 6-item prosthesis satisfaction scale which required participants to rate their level of satisfaction (1 'very dissatisfied' to 5 'very satisfied') with the comfort, weight, colour, shape, usefulness and noise of their current prosthesis. Satisfaction was on average high and was found to be negatively correlated with depressive symptomology as assessed by the CES-D. Unfortunately no breakdown of the scores was provided so it is not possible to ascertain the relative importance of different aspects of satisfaction with the limb. The recently developed Trinity Amputation and Prosthesis Experience Scale (TAPES; Gallagher & MacLachlan, 2000) includes a Prosthesis Satisfaction Scale which has the advantage of containing separate sections regarding functional satisfaction, aesthetic satisfaction and weight satisfaction. It would be useful to see whether the finding reported by Williamson et al. could be replicated using this measure. Prosthesis Satisfaction would be expected to be negatively associated with levels of distress and psychosocial adjustment problems.

1.4.3 Psychosocial factors

Due to the failure of patient characteristics and disability variables to fully explain adjustment to lower limb amputation, recent research has attempted to address the relevance of psychosocial factors.

1.4.3.1 Perceived social support.

Rybarczyk et al. (1992) found evidence in a study of lower limb amputees to suggest that perceived social support as measured by the Interpersonal Support Evaluation List (Cohen, Mermelstein, Karmarck & Hoberman, 1985, as cited in Rybarczyk et al., 1992) negatively correlated with and predicted depression. Similar results were reported by Williamson et al. (1994).

1.4.3.2 Social discomfort.

Another potential mediator of psychological adjustment to amputation is the degree of social discomfort experienced by an individual. Rybarczyk et al. (1992) defined social discomfort as "*being uncomfortable with social contacts involving acknowledgement of*

their amputation or prosthesis" p 1169. Clinical experience suggests that amputees who are distressed by conversations involving references to their amputation or prosthesis seem to be particularly prone to psychological adjustment problems compared to other amputees. In a sample of lower limb amputees with an average age of 69 years, Williamson (1995) reported that almost a third (29.2%) of her sample of lower limb amputees indicated that they felt at least 'somewhat uncomfortable' in public, with 13.1% reporting that this was definitely the case. Rybarczyk et al. (1992) developed a three-item instrument to measure social discomfort specific to adults with amputations and compared this with levels of depression as measured by the CES-D (Radloff, 1977). They found that high levels of social discomfort were a strong predictor of depressive symptomology. They also found that amputees who reported high social discomfort did not feel significantly different levels of satisfaction with the functional or aesthetic aspects of their prostheses compared with amputees who did not report high social discomfort. This finding suggests that social discomfort is not directly predicted by how noticeable or awkward an individual finds their prosthesis. The newly developed Trinity Amputation and Prosthesis Experience Scale (TAPES; Gallagher & MacLachlan, 2000) has a social adjustment section which taps into similar issues to those investigated by Rybarczyk et al. (1992). It would be interesting to see if similar results could be obtained in this country using this new measure.

1.4.3.3 Perceived social stigma.

It has been acknowledged that patients with visible disabilities often experience reactions from others including shock and varying degrees of revulsion (Henker, 1979). A group of studies by Kleck and colleagues have illustrated that non-disabled individuals are more anxious when interacting with a person who has a visible disability than if the disability is invisible (e.g. Kleck, Ono & Hastorf, 1966; Kleck, 1968). Non-disabled people are also more likely to terminate an interaction sooner than they usually would when the interaction involves a disabled person. Indeed there is evidence that non-disabled people will try to avoid conversations with disabled people altogether when a socially acceptable excuse is available (Snyder, Kleck, Strenta & Mentzer, 1979). This body of research indicates that amputees are likely to encounter a wide range of biased attitudes and behaviours when interacting with non-disabled people.

Rybarczyk et al. (1995) defined perceived social stigma as an "*individual's perception that others hold negative stereotypic attitudes about him or her as a result of disability*" p 97.

They developed a 22-item Perceived Social Stigma Scale (PSSS) and found that amputees who reported being more stigmatised by others were more likely to be depressed. High levels of perceived social stigma were also linked to poorer overall adjustment, as rated by the individual's prosthetist.

1.4.3.4 Body image.

Body image can be defined as the individual's mental picture of themselves (Cash & Pruzinsky, 1990). Emotional distress may arise when there is a discrepancy between the perceived physical state and a previously established body image or body ideal. Many events may give rise to disturbances in body image. For example, relatively inconsequential and temporary changes such as bruising, spots, and weight gain/loss can cause body image disturbance, as can often overlooked or taken for granted changes that are part of passing through life such as secondary sexual features, pregnancy, and signs of aging (Henker, 1979). In the general population Thompson (1990) has demonstrated a link between negative body image and various psychological problems including depression, poor self-esteem and social anxiety.

It is perhaps not surprising that patients who experience a surgically induced change in appearance often develop body image problems (Bradbury, 1996). In amputation the removal of a limb represents the loss of the normal, perfect body to which each perceives themselves to be entitled. English (1989) has suggested that amputation can be particularly difficult for women because "*there is the real, added fear of loss of attractiveness to their partner or a reduction in their prospects of a satisfactory marriage*" p 1287. Individuals with an amputation must reconcile three different images of their body: (a) before the amputation, (b) without a prosthesis, and (c) with a prosthesis.

Anecdotal clinical reports suggest that there may be a connection between negative body image and psychological maladjustment to leg amputation (Frierson & Lippmann, 1987). An early study (Furst & Humphrey, 1983, cited by Waites & Zigmond, 1999) highlighted the significance many amputees attach to body image changes. They found that in their study of 19 amputees, 6 of the 8 women and 3 of the 11 men considered the change in body image as a more intrusive handicap than the impairment of function. More recently Rybarczyk et al. (1995) developed the Amputation Related Body Image Scale (ARBIS), an 11-item measure which addresses body image issues specific to this type of disability and found that some

amputees displayed embarrassment, shame or revulsion about their altered bodies. As this study was cross-sectional it is not possible to say whether these feelings were stable over time, but the finding that feelings of self-stigma were as common amongst individuals who had had recent amputations as for those who had had their amputation years previously suggests that this may be the case. The study found that these types of perceptions were significant predictors of poorer adjustment in terms of depression (as assessed by CES-D) and lower overall Quality of Life.

1.5 Measurement of amputation-related issues

When reviewing the literature on adjustment to amputation it became apparent that there are very few measures which address the issues specific to amputees such as prosthesis satisfaction, activity restriction and adjustment to amputation. Of those measures that have been developed the content is often theoretically driven but there is no empirical justification for the final content of the questionnaire (e.g. The Amputation Related Body Image Scale and the Perceived Social Stigma Scale, both devised by Rybarczyk et al., 1995). Furthermore such tools have limited or no evidence of reliability and validity and are narrowly focussed, dealing with only one aspect of adjustment to an amputation or prosthesis use. The exception to this is the newly developed Trinity Amputation and Prosthesis Experience Scale (TAPES; Gallagher & MacLachlan, 2000). This tool was well constructed in that the questionnaire content was developed through not only a review of the literature, but also by gathering expert opinion and conducting focus groups involving people who had had a lower limb amputation in order to identify factors important in the adjustment process. Factor analysis was then used to determine the content of the final version of the questionnaire and the subscales were found to have high internal reliability. Despite the relative infancy of the measure the authors report that it appears to be psychometrically strong.

1.6 Cognitive models of emotion

The amputee needs to adjust to their new body reality in such a way as to regain self-esteem and fend off decompensating assaults from the outside world. Cognitive models of emotions may be useful in describing how this can be achieved.

1.6.1 The role of schemas

Cognitive models of emotion (after Beck, 1976) have gained high credibility over the last thirty or so years. Such models suggest that individuals develop a set of rules or assumptions (schema), which enable them to organise and make sense of their world and their experience. Schemas are a central concept in the formation of a variety of psychological disorders (Hawton, Salkovskis, Kirk & Clark, 1989).

According to the cognitive model, each individual holds a diverse array of self-representations (Markus, 1990). Examples of the different domains of self-representations include personality, sex-role identity, the social self and body weight/shape/appearance. Of the many different facets of self-representation, only some become focal for that individual and receive a high degree of elaboration. Those representations that, for whatever reason, become focal for that individual are the self-schemas. People with a self-schema for a particular domain, or a specific issue consider these domains and issues to be of critical personal importance. As such they maintain an enduring investment and commitment to these self-defining domains. Self-schemas are hypothesised to dominate and guide processing of information and drive behaviour. Once established, the influence of these self-schemas is pervasive.

1.6.1.1 Relevance of the appearance schema in amputation.

It is particularly important to note that people differ in the domains in which they define themselves. Someone who is schematic for a particular dimension of the self will process information relevant to that dimension differently than someone who is aschematic for that dimension (Altabe & Thompson, 1996). For example a person who is schematic for physical appearance would encode, process and react to a wide variety of appearance-related stimuli. For instance the sight of a cake may precipitate thoughts of weight gain and advertisements claiming to improve hair condition may be more readily noticed by a person who is highly appearance schematic compared to someone who is less invested in their appearance. It is also possible that interpersonal rejection might be interpreted in such a way that the individual's appearance is somehow held responsible. In a female student population, Cash & Labarge (1996) found that the extent to which someone was appearance schematic was correlated moderately with depressive symptoms as assessed by the BDI. In the same study they also reported that higher levels of investment in appearance were related to poorer social self-esteem and more social-evaluative anxiety.

Due to the change in appearance that arises as a result of amputation and prosthesis wearing, one schema influencing the processing of information about the self which is particularly relevant is the appearance schema. The appearance schema contains beliefs about the importance, meaning and effects of appearance in one's life. People who are 'appearance schematic' are more psychologically invested in their appearance as a standard of self-evaluation and index of self-worth. People who over value their appearance define themselves by how they believe they appear to others. Consequently they are more likely to be disturbed if their appearance does not conform to the model endorsed by society. There is some support for this view as it has been found that the psychological impact of surgery which results in unwanted changes in appearance is heavily influenced by the meaning of the appearance change for the individual and less so by the extensiveness or objective severity of the change (White, 2001).

To date no studies have been published looking at the relationship between appearance schemas and adjustment to limb amputation. It is reasonable to predict that people who are more invested in their appearance would be more likely to experience psychological problems following amputation. If such a relationship were established, then interventions could be targeted at changing appearance-related schema. Although schema are regarded as relatively stable constructs, there is evidence that they are amenable to change through cognitive-behavioural interventions (Grant & Cash, 1995; Cash & Lavalley, 1997).

1.6.1.2 Measurement of appearance schemas.

There are a number of questionnaires that can be used to assess cognitive-behavioural aspects of appearance-altering surgery and these are reviewed here.

The Situational Inventory of Body Image Dysphoria (Cash, 1994) is a 48-item measure. The items invite respondents to consider various situations and rate the frequency with which they would experience negative feelings about their appearance in that situation. The situations include social and non-social contexts, activities related to exercising, grooming, eating and responses to changes in appearance such as weight or hairstyle. A further two open-ended items enable patients to detail any situations not covered by the questionnaire. However within the context of the current study a 48-item measure was considered too long.

The Body Image Ideals Questionnaire (Cash & Szymanski, 1995) is used to assess ideal-self discrepancies regarding appearance. It requires respondents to compare their current physical appearance to their ideal on each attribute (e.g. 'my ideal facial features are: Exactly as I am, almost as I am, fairly unlike me, very unlike me'). They then rate how important each physical attribute is to them on a 4-point scale.

The Appearance Schemas Inventory (Cash & Labarge, 1996) is a 14-item measure which assesses core beliefs and assumptions about the importance, meaning and impact of beliefs about appearance. These beliefs actively comprise the body-image schema and therefore this was felt to be the most appropriate tool for the current study. A further advantage of this measure is that it was developed to tap fairly broad assumptions without reference to specific physical attributes.

1.6.2 Need for flexibility in schema

According to the cognitive model, schema are usually modified through ongoing experience, however problems can arise if they are too demanding, inflexible and extreme (Beck, 1976). In the limited research on positive adjustment to disability, this need for flexibility in an individual's value system is acknowledged. In particular, positive adjustment is predicted by a move away from basing one's worth on either physical characteristics or comparative value (e.g. I am a valuable person because I look better than most people) to basing self worth on non-physical qualities and on a sense of intrinsic value (e.g. I'm as important as any other person because of my uniqueness) (Wright, 1983; Dunn, 1996). Interestingly these shifts in values parallel many of those proposed as being critical in the developmental changes of late adulthood.

1.6.3 How self-focus limits modification of schema

Recently Wells and Mathews (1994) have developed a model of emotional disorder, which integrates schema theory with information processing research. Their Self-Regulatory Executive Function (S-REF) model proposes that emotional dysfunction arises from chronic and intense self-focus. Prior to elaborating this theory it is important to define the concepts of self-focus and self-consciousness.

1.6.3.1 Definition of self-focus and self-consciousness.

Fenigstein, Scheier, & Buss (1975) have defined self-focussed attention as, “*when the person is focussing on his thoughts, feelings, behaviours or appearance; when he is reflecting, fantasising or daydreaming about himself; or when he is making decisions or plans that involve himself*” (p.522). Self-focus has two major components; one private and one public. Private self-focus is concerned with attending to those aspects of ourselves that are hidden from public view such as our thoughts, feelings, attitudes, wishes, dreams and fantasies. Public self-focus is defined by a general awareness of the self as a social being that has an effect on others. When experiencing public self-focus one is aware of those aspects of oneself that are observable by others such as one’s physical appearance, audible verbalisations, behaviour and expressions of emotions.

Self-focus can be induced by a range of different stimuli. For example, keeping a diary is one activity that focuses attention on the private self, because it encourages one to think about our feelings, motives and reasons for acting. Observation by others, or even having a camera focussed on one can increase public self-focus. Another class of inducers which promote public self-focus are those that provide perceptual feedback to the individual, i.e. they actually show one how one looks or sounds to others. Examples within this category include photographs, audiotapes of one’s voice and the sight of oneself in a full-length mirror.

It is important to note that the term ‘self-focus’ is used to refer to the actual psychological state of being attentive to oneself. Self-focus is the temporary condition of focussing attention on oneself. Some people have a tendency to engage in self-focus even in the absence of an inducer. This relatively consistent tendency to direct attention inward or outward is the trait of ‘self-consciousness’ (Fenigstein et al., 1975). As with self-focus, the private-public distinction still holds.

1.6.3.2 Measurement of self-focus.

A review of the literature indicated that virtually all research on the topic of self-focus has used the Self-Consciousness Scale (Fenigstein, Scheier & Buss, 1975) to assess individual differences in self-focussed attention. Factor analysis by the authors revealed that the measure consists of two subscales on self-consciousness, one private and one public and a third subscale; social anxiety, which is a reaction to the process of self-consciousness

(Fenigstein, 1997; Davis & Franzoi, 1999) and is defined by a discomfort in the presence of others, e.g. 'I feel anxious when I speak in front of a group'. This factor structure has been supported by several other studies using different populations (e.g. Abrams, 1988; Fenigstein, 1997).

However other researchers have suggested alternative factor structures. For example Burnkrant and Page (1984) suggested that Private self-consciousness is subdivided into two subscales which have been labelled: Internal State Awareness (ISA) which relates to positive outcomes; and Self-Reflectiveness (SR), which relates to negative outcomes. Whilst this factor structure has had some support (Cramer, 2000) the original three-factor structure is most commonly used (Wells & Mathews, 1994; Fenigstein, 1997).

1.6.4 The Self-Regulatory Executive Function (S-REF) model

In their S-REF model, Wells & Mathews (1994) proposed that chronic and intense self-focus is responsible for emotional dysfunction as it limits the attentional resources available for processing other information and thus prevents the processing of information that may lead to the modification of the schema. Consequently it would be difficult for people who are highly self-focussed to change their value system and distress results. Indeed there is a substantial body of evidence linking high self-focus with various forms of psychopathology including anxiety and depression (e.g. Ingram, 1990; Schwarzer & Wicklund, 1991).

Within the context of the current study, the S-REF model suggests that an amputee who was appearance schematic and exhibited high self-focus would be unable to take on board information which challenged the belief that appearance is important in determining one's worth. This inflexibility would be likely to result in psychological problems and poor adjustment. A systematic review of the literature has shown that there appears to be no such research at this time concentrating on appearance-related beliefs and self-focus amongst adults who have had a lower limb amputation.

1.6.5 The impact of self-consciousness on the perception of pain

Another feature of high self-consciousness may be relevant to adjustment in amputation. Buss (1980) proposed that private self-focus intensifies affect. Indeed he stated that private self-attention serves "*to deepen melancholy, to heighten elation, to make pain more painful*

and pleasure more pleasurable” p 14. There is ample research evidence to support this theory (see Davis & Franzoi, 1999 for a review). Thus it is hypothesised that self-reported intensity of pain, be it PLP, RLP or pain related to other medical conditions will positively correlate with private self-consciousness. A review of the literature indicated that this area has not received any previous research attention.

1.6.6 Perceived responsibility

Another cognitive issue that has been proposed as relevant to the psychological adjustment process to illness and disability is perceived responsibility.

In the literature on depression there is a body of evidence suggesting that depression is correlated with a tendency to blame oneself for negative outcomes (Rippere, 1994). Indeed Beck (1976) went so far as to suggest that such a tendency was not merely correlated with depression, but rather was instrumental in bringing about depressed mood. Beck regarded the depressive tendency to take personal responsibility for negative outcomes as highly maladaptive and therefore a target for clinical intervention.

Within the field of health psychology there is some support for the claim that attributions of self-blame have negative consequences in terms of psychological adjustment to illness. In an early study, cancer patients were interviewed to determine why they thought they had developed the disease (Abrams & Finesinger, 1953, cited in Brewin, 1982). The results indicated that those who blamed themselves for their misfortune or who saw their illness as a form of punishment for their misdeeds coped least well with their illness. This led the researchers to conclude that blaming oneself has a detrimental effect on the adjustment process. More recently, high self-blame/responsibility has been associated with depression and poor adjustment in patients with a variety of conditions including pain (Williams, Robinson, & Geisser, 1994), renal disease (Rich, Smith, & Christensen, 1999) and HIV (Watts, 2001). Based on this body of evidence it is therefore likely that perceived responsibility for needing an amputation is likely to be positively associated with higher levels of psychological distress and more difficulties with psychosocial adjustment to amputation.

1.7 Summary

Clinical reports and previous research have indicated that there are high levels of psychological distress in a proportion of the lower limb amputee population. It is important to try to improve psychological adjustment in this group as research has indicated that amongst physically ill people, psychological problems may result in increased hospitalisation, increased demands on families, health and social welfare resources and compromise functional recovery and rehabilitation. Patient-related characteristics and disability-related variables have failed to fully explain adjustment to amputation and more research is warranted in this area. Future research needs to identify factors which are associated with adjustment to amputation. In particular, a study of whether self-focus and appearance-related beliefs are a useful predictor of psychological problems amongst amputees may lead to the possibility of identifying people who are most vulnerable to adjustment problems prior to their amputation. If they can be identified at such an early stage, interventions could be implemented to help minimise distress and therefore maximise the benefit they derive from the prosthesis training programme.

1.8 Hypotheses

Hypothesis One: Levels of psychological distress will be positively associated with self-consciousness.

Hypothesis Two: Those who are more self-conscious will be more invested in their appearance and this will be associated with increased psychological distress and more difficulties with psychosocial adjustment to amputation.

2. a) Those who are more self-conscious are more invested in their appearance.

2. b) Investment in appearance will be positively associated with psychological distress and difficulties with psychosocial adjustment to amputation.

Hypothesis Three: Private self-consciousness will positively correlate with self-reported intensity of pain (including PLP, RLP and pain due to other medical conditions).

Hypothesis Four: People who experience Phantom Limb Pain (PLP) will be more likely to experience psychological distress and difficulties with psychosocial adjustment to amputation.

Hypothesis Five: People who experience Residual Limb Pain (RLP) will be more likely to experience psychological distress and difficulties with psychosocial adjustment to amputation.

Hypothesis Six: Amputees who report additional health problems will be more likely to report psychological distress and difficulties with psychosocial adjustment to amputation.

Hypothesis Seven: Self-ratings of health will be negatively associated with levels of psychological distress.

Hypothesis Eight: High levels of self-rated activity restriction will be associated with higher levels of psychological distress and more difficulties with psychosocial adjustment to amputation.

Hypothesis Nine: Prosthesis satisfaction will be negatively associated with levels of distress and psychosocial adjustment problems.

Hypothesis Ten: Those who feel more responsible for needing their amputation are likely to report higher levels of psychological distress and more difficulties with psychosocial adjustment to amputation.

Hypothesis Eleven: Self-ratings of psychosocial adjustment to amputation will be negatively associated with levels of distress detected on more global and well-standardised measures used to assess distress (HADS).

2. METHOD

2.1 Design

The current study was a cross-sectional quantitative study. All participants completed five measures which gathered information about different types of self-consciousness, appearance-related cognitive assumptions, psychological adjustment, adjustment to amputation and wearing a prosthesis, activity restriction, prosthesis satisfaction and medical issues including pain. This was essentially an investigatory study to consider the associations between these factors.

2.2 Participants

The sample of participants was drawn from two artificial limb and appliance centres (ALACs) in the Midlands of the UK; Leicestershire Disablement Services Centre and Nottingham City Hospital Mobility Centre. As the majority of amputees in the UK are registered with an ALAC (Whyte & Niven, 2001), selecting subjects from these Centres allowed a representative sample of amputees to be gathered. All participants were registered under a medical rehabilitation Consultant at one of these Centres.

Participants were selected in accordance with inclusion/exclusion criteria as follows. To be included, participants had to be over 18-years of age and have had a lower limb amputation within the last five years. All participants wore their prosthesis on a daily basis. People who had had an amputation within the last 6-months were excluded to avoid confounding the data with the normal adjustment reaction. People who had a life-threatening condition (e.g. cancer) were excluded for the same reason.

As the measures used in this study were developed and standardised using English speaking populations it was also a requirement that participants had a good command of the English language.

In total, 67 people took part in the study, 47 of whom were recruited from the Leicestershire Disablement Services Centre and 20 from Nottingham City Hospital Mobility Centre.

The participant sample had a mean age of 64.21 years (s.d. 14.36) with 51 (76 %) male participants and 16 (24%) females. The majority of the participants reported that their ethnic group was white British (n=65, 97%) whilst the remainder stated that they were Indian (n=2, 3%). Within the sample, 16 (23.8%) participants had a unilateral above knee amputation, 43 (64.2%) had a unilateral below knee amputation and a further 8 (12%) participants had bilateral amputations. When asked to give the reason for their amputation 23 (34.3%) participants reported that their amputation was secondary to vascular disease, 22 (32.8%) had had to have an amputation due to their diabetes, 11 (16.5%) had had a traumatic injury, whilst 3 (4.5%) had had cancer and for 8 (11.9%) individuals other conditions were the primary diagnosis.

On average the participants completed the interview 33.09 months after their amputation (s.d. 15.85). Although the participants were asked for how long they had had their prosthesis, the majority did not know exactly. As the researcher did not have access to their medical notes it was not possible to check this date. However, everyone in the study confirmed that they had had their prosthesis for at least 6 months and most indicated that they had received their prosthesis within the first 2-4 months post amputation. The median prosthesis use was 14 hours per day (range 1-18).

Forty (59.7%) participants reported additional medical conditions whilst the remaining 27 (40.3%) had no other medical conditions. The range of other health problems experienced was diverse and included conditions such as arthritis, rheumatism, scoliosis, angina, osteoporosis, back pain, migraines, cataracts and colitis. Of those who had additional medical problems, 25 reported associated pain from that condition.

2.3 Measures

2.3.1 The Hospital Anxiety and Depression Scale (HADS) (Zigmond & Snaith, 1983)

The Hospital Anxiety and Depression Scale (HADS, Zigmond & Snaith, 1983) is a 14-item self-report scale designed to record the present state of Anxiety and Depression (See Appendix A). It was developed for use in general medical outpatient populations but is now widely used in clinical practice and research (Herrmann, 1997) and has been found to be acceptable to participants (Bowling, 1997). As it was originally developed for use with medical patients, items were chosen to distinguish the effects of physical illness from

mood disorders. Therefore scores obtained on the HADS are not considered to be influenced by physiological symptomatology, a criticism of many other measures of affect. This is particularly important in the present study as many of the participants had additional physical health problems. Furthermore this tool has been used by other researchers looking at adjustment to lower limb amputation (e.g. Fisher & Hanspal, 1998; Carter, 2000)

The internal consistency and test-retest reliability of the HADS have been found to be satisfactory (Clark & Fallowfield, 1986; Snaith & Zigmond, 1994; Crawford, Henry, Crombie & Taylor, 2001). Herrmann (1997) reported that the HADS had a good reliability with alpha values ranging from 0.81 to .90. The face, construct and concurrent validity of the HADS and the validity of the separation of the two subscales have also been investigated and found to be satisfactory (Zigmond & Snaith, 1983; Snaith & Zigmond, 1994).

Both the Anxiety and Depression subscales of the HADS consist of seven items, each of which are rated on a 4-point scale ranging from 0-3. Higher scores are indicative of more severe Anxiety or Depression.

2.3.2 The Trinity Amputation and Prosthesis Experience Scales (TAPES) (Gallagher & MacLachlan, 2000).

The TAPES is a relatively new multidimensional self-report instrument designed to better understand the experience of, and adjustment to, both a lower limb amputation and the need to wear a prosthesis (see Appendix B).

The first section of the measure gathers data on respondent characteristics: gender, age, length of time with an artificial limb, type of artificial limb (i.e. whether it is below knee or above knee amputation) and cause of amputation. This is followed by three scales on Psychosocial Adjustment, Activity Restriction and Prosthesis Satisfaction. The final section of the measure addresses Medical Issues. Factor analysis by the authors (Gallagher & MacLachlan, 2000) indicated that the three scales could each be broken down into three factors.

Method

The 15-item Psychosocial Adjustment scale can be further broken down into three 5-item subscales (General Adjustment, Social Adjustment and Adjustment to Limitation).

Respondents rate each item on a 5-point scale ranging from 'strongly disagree' to 'strongly agree'. Scores for the subscales range from 5-25 with higher scores indicating better adjustment.

The 12-item Activity Restriction scale concerns activities one might do in a typical day and whether having an artificial limb limits one in these activities and if so, to what extent.

Factor analysis has indicated that this section consists of three 4-item subsections; Athletic Activity Restriction (e.g. sport and recreation), Functional Restriction (e.g. walking 100 yards) and Social Restriction (e.g. visiting friends). Response options are: 'limited a lot' (2), 'limited a little' (1) and 'not limited at all' (0). Scores for the subscales range from 0-8 with higher scores being indicative of greater activity restriction.

The 10-item Prosthesis Satisfaction scale assesses the extent to which respondents are satisfied with different aspects of their artificial limb. There are three subscales: Functional Satisfaction; Aesthetic Satisfaction and Weight Satisfaction. Ratings are made on a 5-point scale ranging from 'very dissatisfied' to 'very satisfied'. The Functional Satisfaction subscale contains 5 items with a potential score range from 5-25. There are four items in the Aesthetic Satisfaction subscale with a potential score range from 4-20. As the Weight Satisfaction contains only one item, scores in this subscale range from 1-5. Higher scores in each of the Satisfaction subscales are indicative of greater satisfaction with the prosthesis.

The final section of the TAPES assesses the experience of Phantom Limb Pain, Residual Limb Pain and Medical Problems not related to the amputation. Each of the aforementioned is subdivided into questions relating to how often it is experienced, how long each episode lasts, how the level of pain can be described ('mild', 'discomforting', 'distressing', 'horrible', 'excruciating') and the extent to which it interferes with daily lifestyle ('not at all', 'a little bit', 'moderately', 'quite a bit', 'a lot'). This section of the TAPES also incorporates two items requiring respondents to rate their health and physical capabilities along a five-point scale ('very good', 'good', 'fair', 'poor', 'very poor').

Despite the relative infancy of the measure the authors (Gallagher & MacLachlan, 2000) report that it appears to be psychometrically strong. The authors report that all of the subscales exceeded the minimum desired level of internal consistency (Cronbach's alpha reliability values ranged from .75-.89). Furthermore their preliminary investigations indicated that there is evidence for construct (divergent and convergent) validity.

This measure was selected due to its broad coverage compared with previous amputation measures which have been narrowly focused, dealing with only one aspect of adjustment. Furthermore it was felt that a general disability measure would not be suitable as it would not be sensitive to some of the peculiarities of this specific disability such as the adjustment to and satisfaction with a prosthesis.

2.3.3 Additional questions attached to TAPES

In this study the researcher added three questions to the TAPES (see Appendix C). Two gathered additional participant information, questioning about the date of their amputation and their ethnic group. The third question asked, "To what extent do you feel responsible for having needed an amputation?" and required a response on a five-point scale ('wholly responsible', 'very responsible', 'quite responsible', 'slightly responsible' 'not at all responsible').

2.3.4 The Self Consciousness Scale (SCS) (Fenigstein, Scheier & Buss, 1975)

The Self Consciousness Scale (SCS) is a 23-item scale constructed to assess individual differences in Self-Consciousness (see Appendix D). The instrument was devised specifically for use in the general population. Each item is rated on a scale of 0 ('extremely uncharacteristic') to 4 ('extremely characteristic'). Higher scores are indicative of greater levels of Self-Consciousness.

Factor analysis by the authors revealed that the measure has three key components: Public Self-Consciousness; Private Self-Consciousness; and Social Anxiety. The 10-item Private Self-Consciousness factor is concerned with attending to one's inner thoughts and feelings, e.g. "I reflect about myself a lot". A person who agrees with these items would be one who habitually looks inside the self, fantasizes, and examines moods, motives and mental processes. The 7-item Public Self-Consciousness factor is defined by a general awareness of the self as a social being that has an effect on others, e.g. "I'm very concerned about the

way I present myself'. People who agree with these items would be habitually aware of and concerned about their appearance, social behaviour and the general impression they make on others. The third factor, Social Anxiety consists of 6 items and is defined by a discomfort in the presence of others, e.g. "I feel anxious when I speak in front of a group". Social Anxiety is often considered to be a by-product to high Public Self-Consciousness; a person who agrees with these items would generally be shy, easily embarrassed and anxious in social situations.

The SCS has been shown to be psychometrically sound and stable across time. The authors report good reliability (test retest correlations were: public $r = .84$, private $r = .79$ and social anxiety $r = .73$). The construct validity and discriminant validity of the subscales has also been supported (Turner, Scheier, Carver & Ickes, 1977).

The SCS has been used extensively in applied research and has been translated into several different languages (e.g. Heinemann, 1979; Cyr, Bourchard, Valiquette, Lecomte et al., 1987; Nystedt & Smari, 1989)

2.3.5 The Appearance Schemas Inventory (ASI) (Cash & Labarge, 1996)

The Appearance Schemas Inventory (ASI) (Cash & Labarge, 1996) (see Appendix E) was developed to assess fairly broad core, appearance-related cognitive assumptions without reference to specific physical attributes (e.g. weight, facial features or grooming attire).

The ASI consists of 14 statements which respondents rate on a 5-point scale in which a score of 1 represents 'strongly disagree' and 5 represents 'strongly agree'. Higher scores reflect greater body-dissatisfaction.

Factor analysis (Cash & Labarge, 1996) has suggested three moderately inter-related components of the ASI. The Body Image Vulnerability subscale consists of six items which assess the individual's assumptions that their appearance is inherently defective and socially unacceptable. The 5-item Self-Investment subscale concerns beliefs that one's appearance is life-shaping and central to self-concept and that one must pursue and maximise physical attractiveness. The final subscale, Appearance Stereotyping, contains just 3 items which tap into assumptions about the social meanings of an attractive/unattractive appearance.

The internal consistency of the ASI is good with Cronbach's coefficient alpha ranging from .79 to .84 (Cash & Labarge, 1996). Cash and Labarge reported that the measure has a 1-month test-retest stability of .71 which is well above the minimum value of .64 recommended by Kline (1993 cited in Clark-Carter, 1997). Furthermore Cash and Labarge have reported that the ASI demonstrates good convergent construct validity with a variety of established measures of body image cognition (e.g. the Multidimensional Body-Self Relations Questionnaire (MBSRQ) (Cash, Winstead & Janda, 1986 cited in Cash & Labarge, 1996) and the Situational Inventory of Body Image Dysphoria (SIBID) (Cash, 1994). Furthermore, the scale was reasonably free of social desirability and unaffected by subjects' body weight/size, as reflected by their body mass index. The ASI therefore seems to be a reliable and valid way of assessing participants' body image cognitions.

This measure was selected as it is the only measure to assess core beliefs and assumptions about the importance, meaning and impact of beliefs about appearance without reference to specific physical attributes.

2.4 Procedure

Administrative staff at the two artificial limb and appliance centres identified potential participants from information held about them on the Patient Information Databases. These 'potential participant lists' were then checked and approved by the Consultant responsible for medical care in order to ensure eligibility for the study. At Leicester a total of 109 individuals met the inclusion criteria. At Nottingham, 65 possible participants were identified.

All 174 patients who met the inclusion criteria were sent an initial contact letter by their medical Consultant inviting them to participate in this study. At this time they also received a detailed information sheet and a reply form for them to return in a pre-paid envelope if they wished to take part (see Appendices F and G). No payment was offered for participation in this study. At one Centre, participants were offered the use of hospital transport. As this service was not available at the other Centre, home visits were offered as an alternative.

Unfortunately, three individuals died prior to receiving the information pack and another two packs were returned with the addressee no longer known at the address. A further two people wrote back indicating that they were not eligible to take part in the study because they had difficulties understanding English. Another two potential participants wrote to say they did not feel well enough to take part in the study. No information was available about why other people declined to take part. Those who returned the reply slip were then contacted by the researcher by telephone to arrange a convenient time to meet. At this stage, four people were excluded because they did not wear a prosthesis and two participants were deemed not eligible as they were receiving treatment for life-threatening conditions.

Data collection commenced in July 2001 and continued for a nine-month period until March 2002. The majority of interviews were carried out at the artificial limb and appliance centres but home visits were made to seven individuals who had transport difficulties. At the start of every meeting, the purpose of the study was briefly explained and there was opportunity for the participant to ask any questions. At this stage, one interview was abandoned because the participant appeared confused and disorientated. Therefore from a total of 158 potentially eligible participants a total of 67 people took part, representing an opt-in rate of 42.4%.

Written consent was obtained once the participant fully understood what was expected (See Appendices H & I). The measures were then completed in the form of verbal interviews. During the interview participants were given prompt sheets for each questionnaire with the range of possible responses on them. The order of presentation of measures was counterbalanced across participants using Latin Squares. Appointments typically lasted about an hour and no follow-up assessment was conducted.

2.5 Ethical Issues

Elmes, Kantowitz & Roediger (1992) outlined some of the main ethical concerns in research as informed consent, confidentiality, debriefing, deception, opportunities to withdraw and long-term consequences. In this study participants were fully informed about the project and had time to ask questions prior to deciding whether they wished to take part. In line with standard ethical practice it was made clear that refusal to participate would not affect their treatment in any way. Time was provided at the end of the appointment to debrief

participants and to answer any further queries. Confidentiality was assured as all participants were assigned a number which was the only way of identifying them in relation to the data held. Furthermore results were analysed by group rather than individual to ensure confidentiality.

One issue that was a particular concern at the planning stage was what provision could be offered to those who presented as distressed during the course of the interview or who requested further support. At one Centre there was a part-time counsellor to whom patients were able to self-refer. At the other Centre it was agreed that participants would be advised by the researcher of how to access the appropriate local support agencies.

Approval for the research was obtained from both Leicestershire Research Ethics Committee and Nottingham City Hospital Research Ethics Committee prior to recruitment of participants (see Appendices J & K).

3. RESULTS

The Results section initially provides a review of the plans for the statistical analysis. A summary of the data for each of the measures is then presented. The analyses relating to the hypotheses are then reviewed in turn. Finally, additional analyses are presented.

3.1 Statistical Analysis

Before any analysis was carried out, variables were examined to determine whether it was appropriate to use parametric tests. Field (2000) summarised the four basic conditions under which it is appropriate to use parametric statistics: The level of measurement is interval or ratio; the distribution of the population scores is normal; the variances of the variables are homogenous; and data from different subjects are independent. However the issue regarding level of measurement is contentious. In practice many researchers treat data derived from multiple-item ordinal-scale measures as though it were interval data (Bryman & Cramer, 1990). Recently Clark-Carter (1997) has suggested that *“if the variable is ordinal but has sufficient levels-say 20 or more- then as long as the other parametric requirements are fulfilled, it is considered legitimate to conduct parametric tests on the data”* p204.

In this study several variables including the participant's age, time since amputation and average duration of episodes of pain provided ratio data. Others variable such as sex, reason for amputation and type of amputation were categorical. Strictly speaking, most of the measures used in this study provided ordinal data. However, variables which gathered ordinal data were examined in terms of the Clark-Carter rule to see if they could be treated as interval data.

Ratio data or data which were ordinal but met the Clark-Carter rule were then subjected to Kolmogorov-Smirnov tests to assess whether the distribution of scores differed significantly from a normal distribution. The majority of the variables were found to depart significantly from a normal distribution. In conclusion, preliminary analysis of the variables (see Appendix L for a summary) demonstrated that for the majority of variables it could not be assumed that the conditions for parametric analysis had been satisfied; therefore mainly non-parametric statistical analyses were performed. However it is of note

that one of the three main outcome measures used in this study, the Psychosocial Adjustment Scale Total, did meet the necessary assumptions and as such parametric tests were used when appropriate.

Initial analysis included frequency and descriptive statistics.

Where a non-parametric test was required to investigate associations between variables, Kendall's tau-b (τ) was used in preference to Spearman's rho. Although Spearman's rho is traditionally more popular, it has been argued that this preference is misplaced, being due to the fact that this statistic was easier to calculate in pre-computer days rather than any distinguishing features of the test itself (Clark-Carter, 1997). When it is possible to use computers for analysis, Kendall's tau-b is recommended as it provides a better estimation of the value which would have been obtained for the population from which the sample came (Clark-Carter, 1997; Howell, 1997; Field, 2000). Indeed for this data set Kendall's tau-b is more accurate as the data includes tied scores and the version of Spearman's rho calculated by SPSS does not take into account tied scores as does Kendall's tau-b.

Kendall's tau-b varies between -1 and $+1$. Bryman and Cramer (1990) comment that there is little consensus regarding interpreting the size of correlations. Current interpretation is based on the guidelines they cite: 0.20 to 0.39 is low; 0.40 to 0.69 is modest; 0.70 to 0.89 is high and 0.90 to 1 is very high (Cohen & Holliday, 1982, cited in Bryman & Crammer, 1990).

On the few occasions when it was appropriate to use a parametric test to investigate associations between variables, Pearson's Product Moment coefficient was used.

Where comparisons between groups were made, and the data were non-parametric, Kruskal-Wallis analysis of variance or Mann Whitney U tests were used. When the data met parametric assumptions one-way between subjects ANOVA's or independent groups t tests were employed.

Whenever a statistical test is used more than once, the likelihood of achieving a statistically significant result is increased, even though the Null Hypothesis of no effect is correct. That is there is an increased danger of making a Type 1 error. It is possible to adjust the α -level, which a given test would have to achieve before statistical significance

was considered to have been reached, to allow for the number of times the same test was being conducted. The most commonly used method is the Bonferroni adjustment which involves dividing α by the number of tests to be performed, thus ensuring that the cumulative Type 1 error is below 0.05. However, such adjustments can be criticised for being too conservative (Clark-Carter, 1997; Field, 2000) as there is a loss of statistical power which means that the probability of rejecting an effect that does actually exist is increased (i.e. there is a greater chance of making a Type II error). It was therefore decided not to use a Bonferroni correction.

A significance level of $p < 0.05$ was taken throughout the analysis. Furthermore, as directional hypotheses were investigated, significance testing was one-tailed. Additional, exploratory analyses employed two-tailed significance testing.

Analysis was conducted using SPSS for Windows version 10 (SPSS Inc., 1999).

3.2 Descriptive statistics

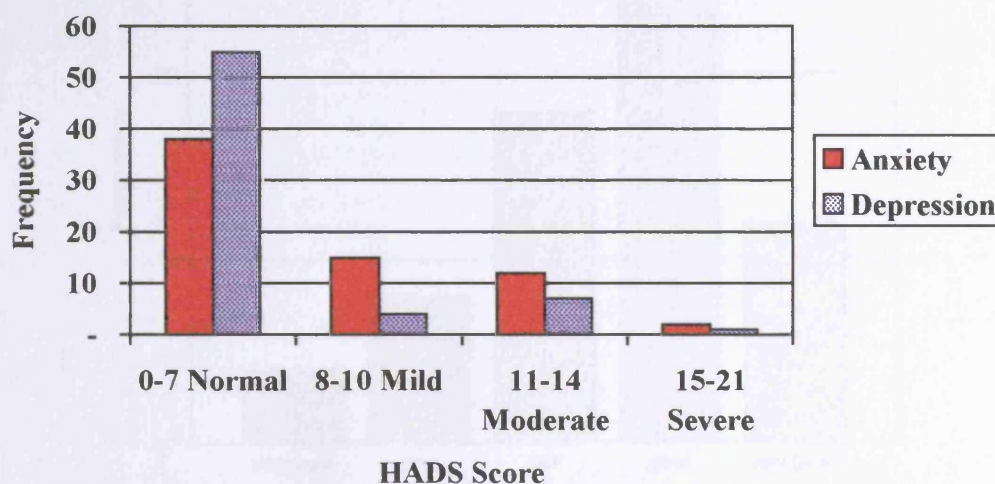
3.2.1 *The Hospital Anxiety and Depression Scale (HADS)*

The HADS is commonly used to detect psychological distress at a level that would warrant intervention. The original authors suggested that for Anxiety and Depression scales alike, a score between 8-10 indicated possible clinical disorder whilst a score in the range of 11-21 indicated probable clinical disorder (Zigmond & Snaith, 1983). In subsequent work they expanded on this to recommend that scores between 8-10 represent 'mild' cases, 11-15 'moderate' cases and 16 or above 'severe' cases (Snaith & Zigmond, 1994). More recently however it has been suggested that scores of 0-7 be given a 'normal' classification; whilst scores of 8-10 represent 'mild' cases, 11-14 'moderate' cases and 15-21 'severe' cases (Johnston, Wright & Weidman, 1995).

A recent study however gathered normative data from a non-clinical community sample and found that 33% of the sample obtained scores that exceeded what Snaith & Zigmond (1994) had defined as the 'normal' range on the Anxiety scale (i.e. they obtained scores of eight or more) (Crawford et al., 2001). This normative data led the authors to raise doubts concerning the existing cut-off scores. They argued that it may be more appropriate to use a cut-off score of 10 and in their study only 12.6% of the sample met that criterion.

Figure 1 shows the breakdown of the sample in terms of 'caseness' using both thresholds.

Figure 1 Histogram for the HADS scores



As shown in Figure 1, for the Anxiety scale, 29 (43.3%) participants of the present study obtained scores above the range identified as the threshold for case detection using the criteria recommended by Snaith & Zigmond (1994). However the prevalence rate was reduced to 20 (29.9%) when the more conservative threshold suggested by Crawford et al. (2001) was applied. Scores for the Depression scale tended to be lower; only 12 (17.9%) participants obtained scores above the threshold for case detection using the criteria recommended by Snaith & Zigmond (1994) and this was further reduced to nine (13.4%) when the more conservative threshold suggested by Crawford et al. was applied.

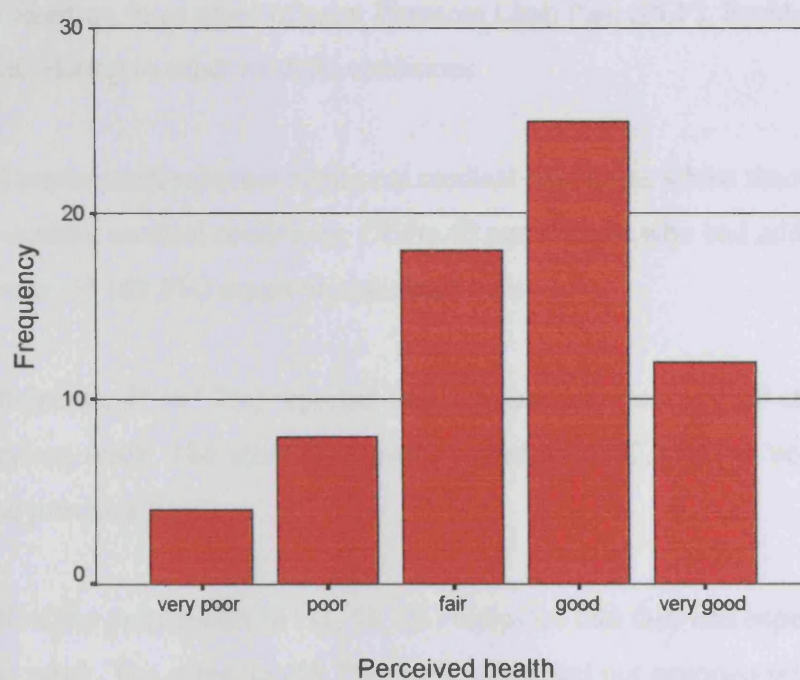
In the current study the higher cut-off score was used as although the HADS was originally developed for use with medical patients, there are a couple of items on the scale that may lead to an overestimation of distress in this particular population of amputees.

3.2.2 Trinity Amputation and Prosthesis Experience Scales (TAPES)

3.2.2.1 Perceived health.

As seen in Figure 2, the majority of participants rated their physical health as 'fair', 'good' or 'very good'. Only 12 (17.9%) reported their health was 'very poor' or 'poor'.

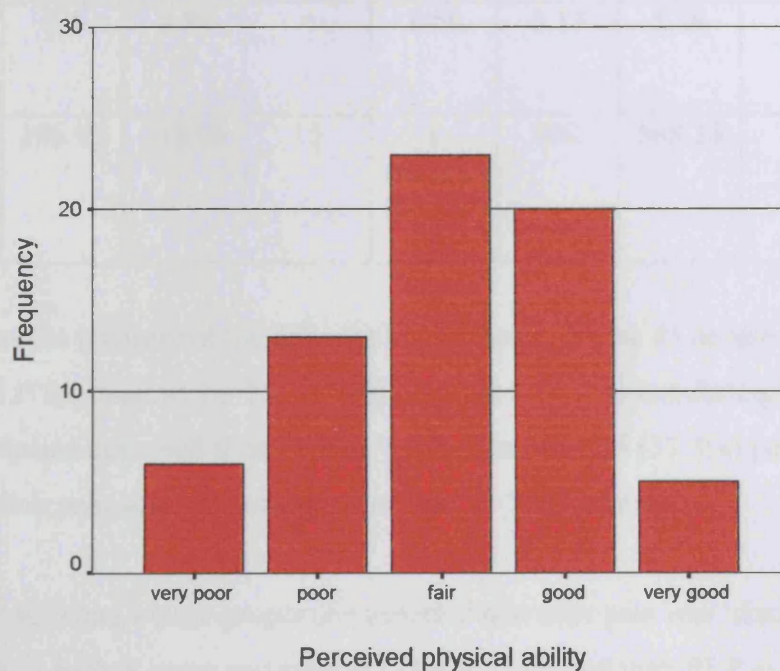
Figure 2 Perceived health



3.2.2.2 Perceived physical ability.

As can be seen in Figure 3 in terms of perceived physical ability the mode response was 'fair'. In total 19 (28.4%) participants felt their physical ability was 'very poor' or 'poor' and twenty-five (37.4%) participants felt that their physical abilities were 'good' or 'very good'.

Figure 3 Perceived physical ability



3.2.2.3 Pain.

Data were gathered on three types of pain; Phantom Limb Pain (PLP), Residual Limb Pain (RLP) and pain relating to other medical conditions.

Forty (59.7%) participants reported additional medical conditions whilst the remaining 27 (40.3%) had no other medical conditions. Of the 40 participants who had additional medical problems, 25 (62.5%) reported associated pain.

Of the 67 participants, 45 (67.2%) reported that they had experienced PLP at least once during the previous week. The other twenty-two participants (32.8%) had not experienced PLP during the previous week.

Just under half of the participants (n=31, 46.3%) indicated that they had experienced RLP during the past week. The other 36 (53.7%) participants had not experienced RLP during the previous week.

The number of episodes of pain per week and duration of amputation related pain episodes are detailed in Table 1.

Table 1 Descriptive statistics for number of and duration of episodes of PLP and RLP

	PLP Sufferers (n=45)				RLP Sufferers (n=31)			
	Mean	s.d.	Median	Range	Mean	s.d.	Median	Range
Number of episodes per week	6.5	8.59	4	1-50	5.13	5.18	4	1-30
Duration (minutes)	186.93	418.06	15	1 minute-24 hrs/day	302	568.26	20	1 minute-24 hrs/day

Figure 4 depicts the intensity of the different kinds of pain. Of the 45 people who experienced PLP the majority (n=23, 51.1%) reported it was ‘discomforting’ whilst seven (15.6%) participants described their PLP as ‘mild’. The other 15 (33.3%) participants reported that their pain was ‘distressing’, ‘horrible’ or ‘excruciating’.

Of the 31 RLP sufferers a large proportion reported that their pain was ‘discomforting’ (n=13, 41.9%). A further seven participants (22.6%) described their RLP as ‘mild’ whilst

five (16.1%) reported it was 'distressing'. In addition, the options 'horrible' and 'excruciating' were both selected by three (9.7%) participants.

The 25 people who had pain relating to other medical conditions tended to rate the intensity of this type of pain as more severe than the ratings given for PLP and RLP.

Whilst the mode response was that the level of pain was 'discomforting' ($n=10$, 40.0%), a significant proportion felt it was 'distressing' ($n=8$, 32%). Only one person (4.0%) reported that their pain was 'horrible' whilst two (8.0%) stated it was excruciating.

Figure 4 Intensity of pain

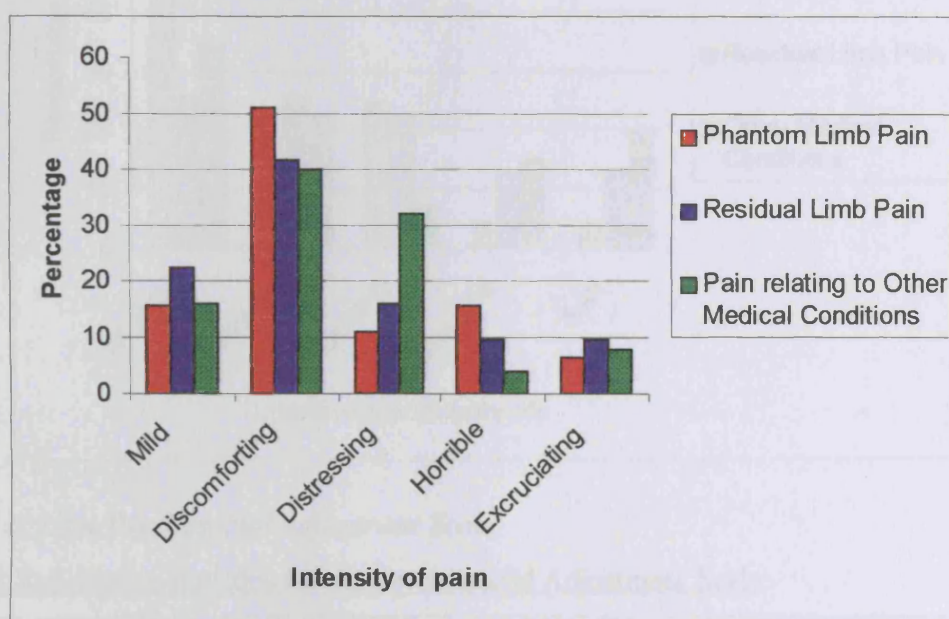
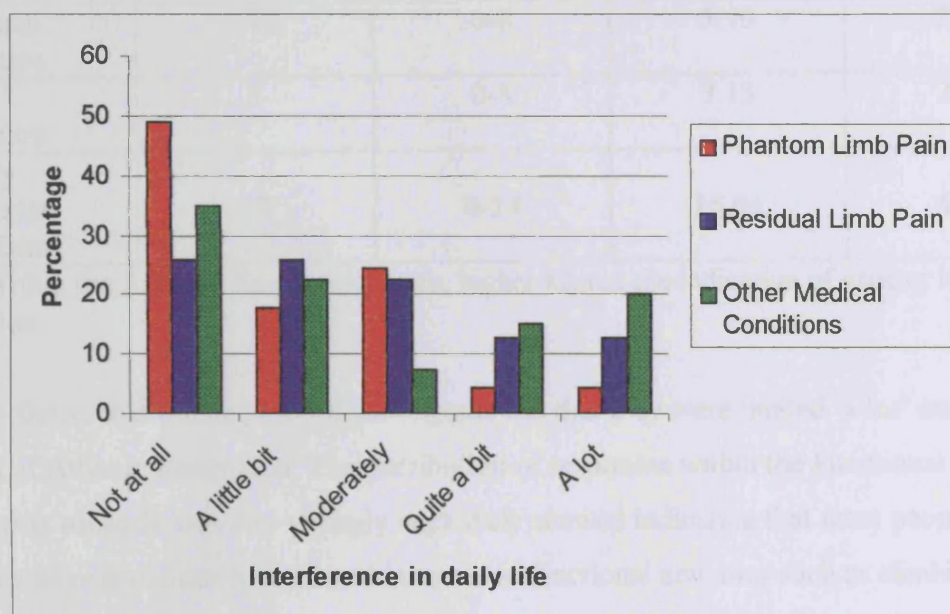


Figure 5 depicts the extent to which the different types of pain interfered with daily life. PLP tended to have relatively low, if any interference in daily life. The most common rating of the extent to which PLP interfered with daily life was 'not at all' which was the response chosen by 22 (48.9%) participants. Eight people (17.8%) reported that PLP interfered 'a little bit' whilst a further 11 (24.5%) endorsed the response 'moderate interference'. The response options 'quite a bit' of interference and 'a lot' of interference were both selected by two individuals (4.4%).

In terms of RLP both the response options 'not at all' and 'a little bit' were selected by 8 (25.8%) participants. Seven (22.6%) felt that they experienced 'moderate interference'. The options 'quite a bit' and 'a lot' were both endorsed by 4 (12.9%) participants.

The 40 people who reported additional health problems were asked about the extent to which these problems interfered with daily life. Fourteen (35.0%) felt they did not interfere at all whilst 9 (22.5%) felt they interfered 'a little bit'. Three participants (7.5%) felt that their health problems interfered 'moderately' and six people (15.0%) felt they interfered 'quite a bit' and eight (20.0%) felt they interfered 'a lot'.

Figure 5 Interference in daily life due to pain or other health problems



3.2.2.4 Psychosocial Adjustment Scale.

Table 2 Descriptive statistics for the Psychosocial Adjustment Scale

Subscale	Median	Range	Mean	s.d.
General Adjustment	20	8-25	19.03	4.43
Social Adjustment	20	12-25	20.70	3.61
Adjustment to Limitation	10	5-25	11.07	5.18
Psychosocial Adjustment Scale Total	50	25-75	50.81	10.30

Note Within the Psychosocial Adjustment Scale, higher scores are indicative of better adjustment.

Table 2 indicates that total scores for the Psychosocial Adjustment Scale were distributed across the full range possible for this variable. This was also true for the Adjustment to Limitation subscale. Data within this subscale were positively skewed indicating that most people had some difficulties in adjusting to limitation. However, in contrast, the scores on

both the Social Adjustment subscale and the General Adjustment subscale were negatively skewed indicating that people tended to be relatively well adjusted in these areas.

3.2.2.5 Activity Restriction Scale.

Table 3 Descriptive statistics for the Activity Restriction Scale

Subscale	Median	Range	Mean	s.d.
Athletic Restriction	8	0-8	6.91	2.07
Functional Restriction	7	0-8	5.90	2.56
Social Restriction	3	0-8	3.13	2.67
Activity Restriction Scale Total	18	0-24	15.94	6.27

Note Within the Activity Restriction Scale, higher scores are indicative of greater levels of restriction.

Table 3 shows that the majority of participants felt that they were limited ‘a lot’ on all aspects of Athletic Restriction. The distribution of responses within the Functional Restriction subscale was also strongly negatively skewed indicating that most people felt that they were significantly restricted in terms of functional activities such as climbing stairs or walking more than 100 yards. In terms of Social Restriction the scores were more evenly distributed, with the average response being suggestive of ‘limited a little’. The total scores for this scale were on average quite high, indicating relatively high levels of restriction.

3.2.2.6 Prosthesis Satisfaction Scale.

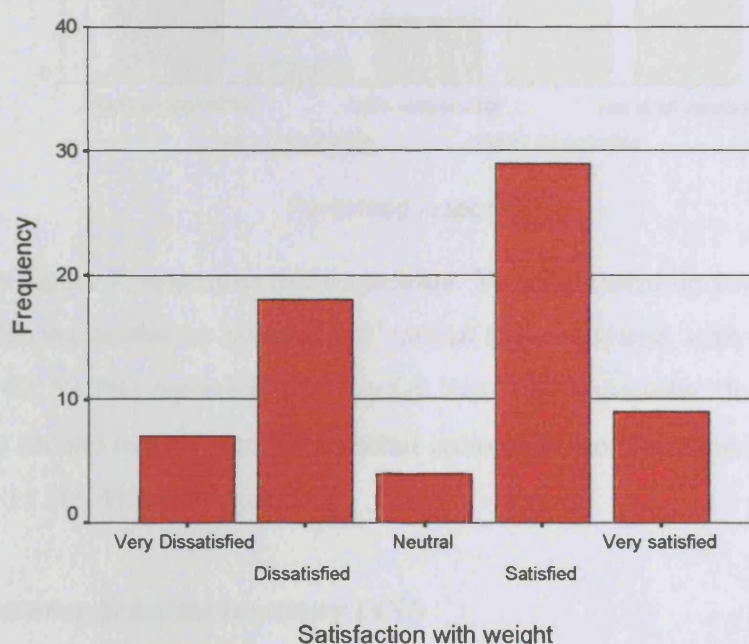
Table 4 Descriptive statistics for the Prosthesis Satisfaction Scale

Subscale	Median	Range	Mean	s.d.
Aesthetic Satisfaction	15	6-20	14.85	3.17
Satisfaction with weight	4	1-5	3.22	1.28
Satisfaction with function	20	5-25	18.73	4.85
Prosthesis Satisfaction Scale Total	38	16-49	36.81	8.19

Note Within the Prosthesis Satisfaction scale, higher scores are indicative of greater satisfaction with the prosthesis.

As indicated in Table 4, in terms of aesthetics, there was a tendency for people to be quite happy with their prosthesis. Similarly a large proportion of people ($n=38$, 56.7%) reported that they were 'satisfied' or 'very satisfied' with the weight of their prosthesis, but as Figure 6 illustrates, it is interesting to note that in total, 25 (37.3%) participants reported that they were 'very dissatisfied' or 'dissatisfied' with the weight of their artificial limb. In terms of function, the data were negatively skewed, with the median response being indicative of 'satisfied'. However eight participants (11.9%) gave responses indicating that overall they were 'dissatisfied' or 'very dissatisfied' with the function of their prosthesis. Overall the total scores for this scale were negatively skewed, suggesting that most people were 'satisfied' with their prosthesis.

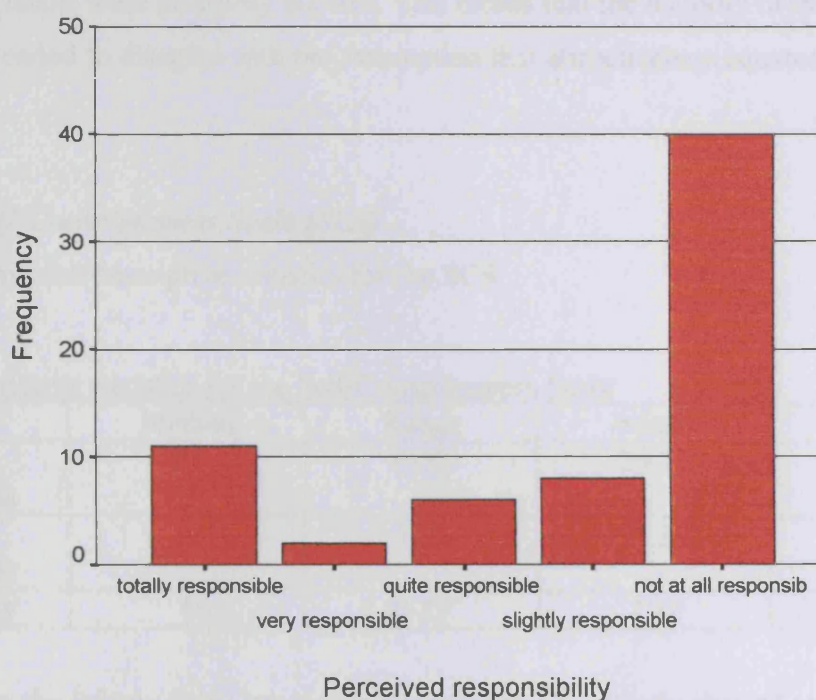
Figure 6 Satisfaction with the weight of their prosthesis



3.2.3. Additional questionnaire attached to the TAPES

3.2.3.1 Perceived responsibility.

Figure 7 Perceived responsibility for needing the amputation



As illustrated on Figure 7, responses to the question ‘To what extent do you feel responsible for having needed an amputation?’ tended to be polarised, with the majority of participants ($n=40$, 59.7%) reporting that they felt ‘not at all responsible’ for their amputation. The second most commonly selected option was ‘totally responsible’ which was selected by 11 (16.4%) participants.

3.2.4 The Appearance Schemas Inventory (ASI)

Table 5 displays the descriptive statistics for the ASI.

Table 5 Descriptive statistics for the Appearance Schemas Inventory

	Median	Range	Mean	s.d.
Body Image Vulnerability	15	6-24	15.37	4.67
Self-Investment	16	7-23	16.51	3.72
Appearance Stereotype	6	3-12	6.30	2.27
Total	37	17-56	38.13	8.05

On the Body Image Vulnerability factor which assess the individual’s assumptions that their appearance is inherently defective and socially unacceptable, the scores were normally distributed across virtually the whole range possible. Similarly scores on the Self-

Investment factor were also broadly distributed with a mean response suggesting a slight agreement with beliefs that one's appearance is life-shaping and central to self-concept and that one must pursue and maximise physical attractiveness. The data for the Appearance Stereotyping factor were positively skewed. This means that the majority of the respondents tended to disagree with the assumption that attractiveness equates to happiness.

3.2.5 The Self-Consciousness Scale (SCS)

Table 6 displays the descriptive statistics for the SCS.

Table 6 Descriptive statistics for the Self-Consciousness Scale

	Median	Range	Mean	s.d.
Private Self-Consciousness	21	6-32	20.21	5.26
Public Self-Consciousness	12	3-23	11.81	5.67
Social Anxiety	6	0-23	7.52	6.54

The scores for the Private Self-Consciousness scale were negatively skewed and the range of responses was from very low to moderate levels of Private Self-Consciousness. No-one's score suggested that they had very high levels of Private Self-Consciousness. In terms of Public Self-Consciousness, again the range was quite broad but no-one displayed very high levels of Public Self-Consciousness. Social Anxiety scores were positively skewed with the median response suggesting that on average the participants felt it was uncharacteristic of them to be shy, easily embarrassed and anxious in social situations.

3.3 Hypothesis testing

Hypothesis One: Levels of psychological distress will be positively associated with Self-Consciousness.

Table 7 Correlation Coefficients for the SCS with the HADS and Psychosocial Adjustment Scale Total

	Psychosocial Adjustment Scale Total		HADS Anxiety		HADS Depression	
	Coefficient	Sig.	Tau-b	Sig.	Tau-b	Sig.
Private Self-Consciousness	$r=.048$	.290	.091	.151	-.108	.114
Public Self-Consciousness	$r=-.363^{***}$	.001	.224**	.005	.199*	.013
Social Anxiety	$r=-.304^{***}$	<.0005	.317***	.0005	.349***	<.00005

Notes

1. On the Psychosocial Adjustment Scale higher scores are indicative of better adjustment.
2. Pearson's Product Moment Correlation Coefficient was used for the correlation between the Psychosocial Adjustment Scale Total and Public Self-Consciousness as both these variables met the requirements for parametric testing (see Appendix L).

* Correlation is significant at the .05 level (1-tailed)

** Correlation is significant at the .01 level (1-tailed)

*** Correlation is significant at the .001 level (1-tailed)

Table 7 illustrates that Private Self-Consciousness was not significantly associated with Anxiety, Depression or Psychosocial Adjustment to amputation. In contrast, there were significant but low correlations between Public Self-Consciousness and all three outcome variables. It is of note that the negative correlation observed between Public Self-Consciousness and Psychosocial Adjustment is due to the fact that higher scores on the Psychosocial Adjustment scale are indicative of better adjustment. Unsurprisingly Social Anxiety which is often considered a by-product of Public Self-Consciousness, was significantly correlated with all outcome variables.

Subsequent analyses indicated that there were significant low correlations between Public Self-Consciousness and the three factors within the Psychosocial Adjustment scale. This is illustrated in Table 8 below.

Table 8 Correlation coefficients for Public Self-Consciousness and subscales within the Psychosocial Adjustment Scale

		General Adjustment	Social Adjustment	Adjustment to Limitation
Public Self-Consciousness	Tau-b	-.195*	-.242**	-.199*
	Sig.	.014	.004	.012

Notes

* Correlation is significant at the .05 level (1-tailed)

** Correlation is significant at the .01 level (1-tailed)

In conclusion, the hypothesis that levels of distress will be positively correlated with Self-Consciousness was supported in terms of Public Self-Consciousness but not in terms of Private Self-Consciousness.

Hypothesis Two: Those who are more Self-Conscious will be more invested in their appearance and this will be associated with increased psychological distress and more difficulties with psychosocial adjustment to amputation.

2. a) Those who are more Self-Conscious are more invested in their appearance.

Table 9 Correlation Coefficients for the ASI and the SCS

	Private Self-Consciousness		Public Self-Consciousness		Social Anxiety	
	Tau-b	Sig.	Coefficient	Sig.	Tau-b	Sig.
Body Image Vulnerability	-.133	.065	$r = .205^*$	.048	.263***	.001
Self Investment	.010	.457	$r = -.063$	.307	.052	.280
Appearance Stereotype	.052	.282	$r = .010$	.456	.151*	.048
ASI Total	-.053	.271	$r = .071$	.285	.225**	.005

Notes

1. Pearson's Product Moment Correlation Coefficient was used for the correlations between Public Self-Consciousness and Body Image Vulnerability, Self Investment and ASI Total as all these variables met the requirements for parametric testing (see Appendix L).

* Correlation is significant at the .05 level (1-tailed)

** Correlation is significant at the .01 level (1-tailed)

*** Correlation is significant at the .001 level (1-tailed)

As illustrated in Table 9, Public Self-Consciousness was significantly correlated with Body Image Vulnerability. Neither Private nor Public Self-Consciousness were associated with any of the other factors within the ASI or with the ASI total. However the Social Anxiety

factor of the SCS was associated with the Body Image Vulnerability factor, the Appearance Stereotype factor and ASI total score.

In conclusion the hypothesis was rejected, as Self-Consciousness was not associated with appearance-related cognitions, with the exception of Public Self-Consciousness which was weakly correlated with Body Image Vulnerability at the 0.05 level.

2. b) Investment in appearance will be positively associated with psychological distress and difficulties with psychosocial adjustment to amputation.

Table 10 Correlation Coefficients for the ASI with the HADS and Psychosocial Adjustment Scale Total

	Psychosocial Adjustment Scale Total		HADS Anxiety		HADS Depression	
	Coefficient	Sig.	Tau-b	Sig.	Tau-b	Sig.
Body Image Vulnerability	$r = -.468^{***}$	<.0005	.315***	<.0005	.376***	<.0005
Self Investment	$r = .167$	.089	.034	.349	.008	.463
Appearance Stereotype	$r = .081$	.182	.099	.136	.217**	.009
ASI Total	$r = -.374^{***}$**	.001	.241**	.003	.296***	<.0005

Notes

1. On the Psychosocial Adjustment Scale higher scores are indicative of better adjustment.
2. Pearson's Product Moment Correlation Coefficient was used for the correlations between Psychosocial Adjustment Scale Total and Body Image Vulnerability, Self Investment and ASI Total as all these variables met the requirements for parametric testing (see Appendix L).

** Correlation is significant at the .01 level (1-tailed)

*** Correlation is significant at the .001 level (1-tailed)

There were significant correlations between the outcome variables of Psychosocial Adjustment, Anxiety and Depression, and both Body Image Vulnerability and the ASI total score. There was also a significant low correlation between HADS Depression scores and Appearance Stereotype scores.

In conclusion, the hypothesis that investment in appearance will be positively associated with psychological problems and difficulties with psychosocial adjustment to amputation was accepted.

Hypothesis Three: Private Self-Consciousness will positively correlate with self-reported intensity of pain (including PLP, RLP and pain due to other medical conditions).

Table 11 Correlation Coefficients for Private Self-Consciousness and Intensity of Pain ratings

	Private Self-Consciousness	
	Tau-b	Sig. (1 tailed)
Intensity of PLP	.111	.472
Intensity of RLP	.003	.174
Intensity of other pain	-.007	.493

As illustrated in Table 11 Intensity of Pain was not associated with Private Self-Consciousness. The hypothesis was therefore rejected.

Hypothesis Four: People who experience Phantom Limb Pain (PLP) will be more likely to experience psychological distress and difficulties with psychosocial adjustment to amputation.

Table 12 Differences between participants with and without PLP on measures of distress

	PLP sufferers (n=45)				Non-sufferer (n=22)				Comparative Statistic	Sig.
	Mean	s.d.	Median	Range	Mean	s.d.	Median	Range		
Psychosocial Adjustment Scale Total	49.36	9.32	49.0	25-75	53.77	11.75	55.0	32-75	t=1.670 *	.050
HADS Anxiety	7.18	4.95	8.0	0-15	4.59	3.13	4.0	0-10	U=347.00*	.024
HADS Depression	5.18	3.80	5.0	0-17	3.77	3.50	2.50	0-11	U=371.00*	.048

Notes

1. On the Psychosocial Adjustment Scale higher scores are indicative of better adjustment.
2. An Independent Groups t-test was used to assess differences in Psychosocial Adjustment Scale Total scores as this variable met the assumptions for parametric tests (see Appendix L) and Levene's test for equality of variance indicated that there was equality ($F=2.296$, $p=.135$).

* Correlation is significant at the .05 level (1-tailed)

As indicated in Table 12 there was a significant difference in Psychosocial Adjustment between those who had PLP and those who did not. Those who did not experience PLP reported a mean Psychosocial Adjustment scale total score of 53.77 whilst those who experienced PLP had a mean score of 49.36. As higher scores on this measure were

indicative of better adjustment it was therefore concluded that people who did not experience PLP displayed better Psychosocial Adjustment than those who had PLP.

There was a significant difference between PLP sufferers and non-sufferers in HADS Anxiety scores. Those who experienced PLP had a higher mean Anxiety score than non-sufferers. Furthermore, using the cut-off recommended by Crawford et al. (2001), 40% of those who suffered PLP met the criteria for clinical caseness compared with a prevalence rate of 9.1% amongst non-sufferers.

There was a significant difference between PLP sufferers and non-sufferers in HADS Depression scores. Those who experienced PLP reported a higher mean Depression score than non-sufferers. Interestingly, using the cut-off recommended by Crawford et al. (2001), the prevalence rates for clinically significant Depression between the two samples were very similar with 13.3% of PLP sufferers meeting the criteria for caseness compared with a prevalence rate of 13.6% amongst non-sufferers.

In summary, the hypothesis that people who experience PLP will be more likely to experience psychological distress and difficulties with psychosocial adjustment to amputation was accepted.

Hypothesis Five: People who experience Residual Limb Pain (RLP) will be more likely to experience psychological distress and difficulties with psychosocial adjustment to amputation.

Table 13 Differences between participants with and without RLP on measures of distress

	RLP sufferers (n=31)				Non-sufferer (n=36)				Comparative Statistic	Sig.
	Mean	s.d.	Median	Range	Mean	s.d.	Median	Range		
Psychosocial Adjustment Scale Total	49.10	9.31	48.0	25-75	52.28	11.01	52.5	32-75	t=1.266	.105
HADS Anxiety	7.13	4.62	8.0	0-15	5.64	4.49	4.0	0-15	U=458.0	.104
HADS Depression	5.65	3.67	5.0	0-17	3.92	3.67	3.0	0-14	U=367.5**	.008

Notes

1. On the Psychosocial Adjustment Scale higher scores are indicative of better adjustment.
2. An Independent Groups t-test was used to assess differences in Psychosocial Adjustment Scale Total scores as this variable met the assumptions for parametric tests (see Appendix L) and Levene's test for equality of variance indicated that there was equality ($F=1.015$, $p=.309$).

**** Correlation is significant at the .01 level (1-tailed)**

There was no significant difference in Psychosocial Adjustment to amputation between those who had RLP and those who did not. Similarly there was no significant difference between those who had RLP and non-sufferers in terms of HADS Anxiety scores.

However when the data was examined in terms of caseness using the cut-off score of 10 as suggested by Crawford et al. (2001), it is interesting to note that the prevalence rate of Anxiety amongst RLP sufferers was 35.5% compared to 25.0% amongst non-sufferers.

There was a significant difference between RLP sufferers and non-sufferers in terms of HADS Depression scores with those who did experience RLP reporting more Depressive symptomatology than non-sufferers. However the two samples were very similar in terms of prevalence of clinically significant levels of Depression; 12.9% of the RLP sufferers met the criteria for Depression, as did 13.9% of the non-sufferers.

In summary, people who experienced RLP reported higher levels of Depressive symptomatology than people who did not experience RLP but in terms of symptoms of Anxiety and Psychosocial Adjustment there was no difference between these two groups. Interestingly when data were examined in terms of clinical caseness, there was a similar

prevalence of Depression in the two groups whilst Anxiety was more prevalent amongst those who suffered RLP.

Hypothesis Six: Amputees who report additional health problems are more likely to report psychological distress.

Table 14 Differences between participants with and without additional health problems on measures of distress

	Additional health problems (n=40)				No additional health problems (n=27)				Statistic	Sig.
	Mean	s.d.	Median	Range	Mean	s.d.	Median	Range		
Psychosocial Adjustment Scale Total	47.95	9.09	48	25-75	55.04	10.70	54	32-75	t=2.914**	.002
HADS Anxiety	7.65	4.64	9	0-15	4.37	3.76	3	0-13	U=313.500**	.002
HADS Depression	5.20	3.85	4	0-17	4.00	3.51	4	0-11	U=438.500	.096

Notes

1. On the Psychosocial Adjustment Scale higher scores are indicative of better adjustment.
2. An Independent Groups t-test was used to assess differences in Psychosocial Adjustment Scale Total scores as this variable met the assumptions for parametric tests (see Appendix L) and Levene's test for equality of variance indicated that there was equality ($F=1.357$, $p=.248$).

**** Correlation is significant at the .01 level (1-tailed)**

As can be seen in Table 14 there was a significant difference between participants who had additional health problems and those who did not in terms of Psychosocial Adjustment and Anxiety levels. People who had additional health problems were more likely to experience Anxiety and Psychosocial Adjustment problems. Using the cut-off score of 10 as recommended by Crawford et al. (2001) the prevalence rates of clinically significant Anxiety were 7.4% in the group who had no additional health problems and 45% in the group who had additional health problems. The difference between the groups in terms of Depression was approaching significance, with participants who had additional health problems tending to be more depressed. The prevalence of clinically significant Depression amongst the group with no other medical problems was 11.1% compared to 15% in the group with additional health problems.

In summary, it would appear that those who have additional health problems are likely to experience greater Psychosocial Adjustment problems and higher levels of Anxiety than those who do not have additional health problems. The hypothesis was therefore accepted.

Hypothesis Seven: Self-ratings of health will be negatively associated with levels of psychological distress

Table 15 Correlation Coefficients for Perceived Health with the HADS and the Psychosocial Adjustment Scale Total

	Psychosocial Adjustment Scale Total		HADS Anxiety		HADS Depression	
	Tau-b	Sig.	Tau-b	Sig.	Tau-b	Sig.
Perceived Health	.350***	<.0005	-.298***	.001	-.407***	<.0005

Notes

On the Psychosocial Adjustment Scale higher scores are indicative of better adjustment.

*** Correlation is significant at the .001 level (1-tailed)

As can be seen in Table 15 Perceived Health showed significant low correlations with Psychosocial Adjustment and HADS Anxiety. The correlation with Depression was moderate and significant. As such the hypothesis that self-ratings of health will be negatively associated with levels of psychological distress was accepted.

Hypothesis Eight: High levels of self-rated activity restriction will be associated with higher levels of psychological distress and more difficulties with psychosocial adjustment to amputation.

Table 16 Correlation Coefficients for the Activity Restriction Scale with the HADS and the Psychosocial Adjustment Scale Total

	Psychosocial Adjustment Scale Total		HADS Anxiety		HADS Depression	
	Tau-b	Sig.	Tau-b	Sig.	Tau-b	Sig.
Athletic Restriction	-.458***	<.0005	.366***	<.0005	.395***	<.0005
Functional Restriction	-.394***	<.0005	.336***	<.0005	.283***	.001
Social Restriction	-.493***	<.0005	.334***	<.0005	.449***	<.0005
Activity Restriction Scale Total	-.509***	<.0005	.391***	<.0005	.445***	<.0005

Notes

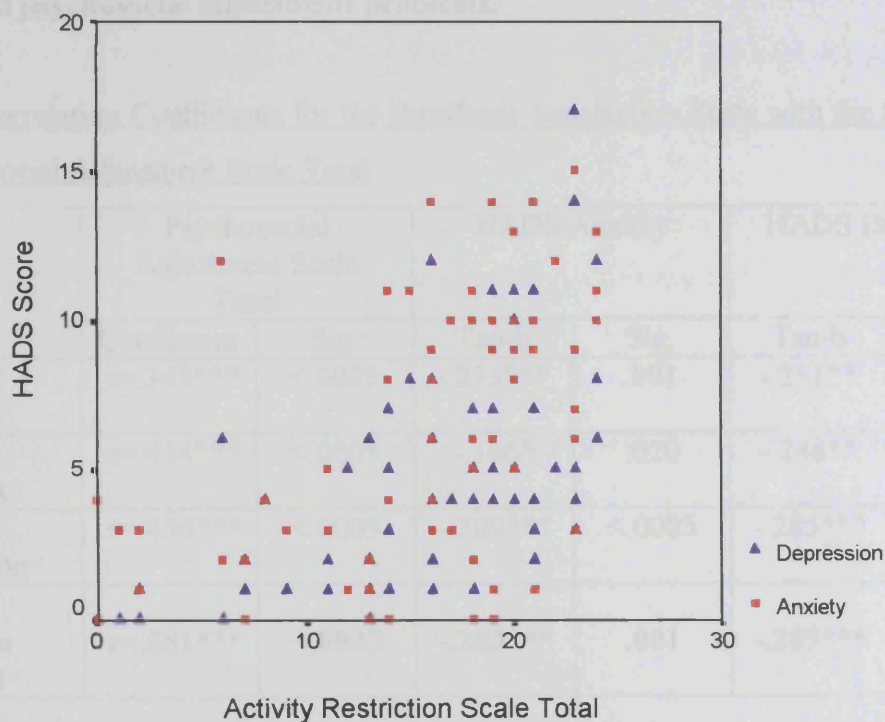
On the Psychosocial Adjustment Scale higher scores are indicative of better adjustment.

*** Correlation is significant at the .001 level (1-tailed)

As illustrated in Table 16, all the factors within the Activity Restriction Subscale were significantly correlated at the 0.001 level with Psychosocial Adjustment, Anxiety and Depression.

Figure 8 displays the correlation between HADS scores and the Activity Restriction Scale total scores. This indicates that whilst some people who had high Activity Restriction scores reported little distress, only one individual with low levels of restriction reported significant levels of distress.

Figure 8 Scatterplot for Activity Restriction and HADS scores



Subsequent analysis using the Kruskal Wallis test indicated that Type of amputation (i.e. bilateral, above-knee or below-knee amputation) did not make a significant difference in terms of Activity Restriction Scale Scores ($\chi^2 = 0.64$, $df=2$, $p=0.969$). Furthermore Public Self-Consciousness was not significantly correlated with Activity Restriction ($\tau b = .118$, $N=67$, $p=0.177$, two-tailed).

In summary the hypothesis which stated that high levels of self-rated activity restriction would be associated with higher levels of psychological distress and more difficulties with psychosocial adjustment to amputation was accepted.

Hypothesis Nine: Prosthesis satisfaction will be negatively associated with levels of distress and psychosocial adjustment problems.

Table 17 Correlation Coefficients for the Prosthesis Satisfaction Scale with the HADS and the Psychosocial Adjustment Scale Total

	Psychosocial Adjustment Scale Total		HADS Anxiety		HADS Depression	
	Coefficient	Sig.	Tau-b	Sig.	Tau-b	Sig.
Aesthetic Satisfaction	$\tau=.345^{***}$	<.0005	-.273***	.001	-.251**	.003
Satisfaction with Weight	$\tau=.414^{***}$	<.0005	-.196*	.020	-.248**	.005
Satisfaction with Function	$\tau=.456^{***}$	<.0005	-.309***	<.0005	-.285***	.001
Prosthesis Satisfaction Scale Total	$r=.581^{***}$	<.0005	-.283***	.001	-.289***	.001

Notes

1. On the Psychosocial Adjustment Scale higher scores are indicative of better adjustment.
2. Pearson's Product Moment Correlation Coefficient was used for the correlation between Psychosocial Adjustment Scale Total and Prosthesis Satisfaction Scale Total as both of these variables met the requirements for parametric testing (see Appendix L).

* Correlation is significant at the .05 level (1-tailed)

** Correlation is significant at the .01 level (1-tailed)

*** Correlation is significant at the .001 level (1-tailed)

As illustrated in Table 17 all aspects of the Prosthesis Satisfaction Scale showed significant correlations with Psychosocial Adjustment, Anxiety and Depression. These correlations were mainly of low magnitude but were modest for satisfaction with weight, satisfaction with function and overall prosthesis satisfaction with Psychosocial Adjustment to amputation.

In summary, the hypothesis that prosthesis satisfaction will be negatively associated with levels of distress and psychosocial adjustment problems was accepted.

Hypothesis Ten: Those who feel more responsible for needing their amputation are likely to report higher levels of psychological distress and more difficulties with psychosocial adjustment to amputation.

There was no significant effect of Perceived Responsibility on level of Depression (tau $b=.033$, $N=67$, $p=.369$, one- tailed), Anxiety (tau $b=.030$, $N=67$, $p=.379$, one- tailed) or Psychosocial Adjustment as assessed by the TAPES (tau $b=-.119$, $N=67$, $p=.107$, one- tailed).

In conclusion, the hypothesis that those who feel more responsible for needing their amputation are likely to report higher levels of psychological distress and more difficulties with psychosocial adjustment to amputation was rejected.

Hypothesis Eleven: Self-ratings of psychosocial adjustment to amputation will be negatively associated with levels of distress detected on more global and well-standardised measures used to assess distress (HADS).

There were significant negative correlations between the TAPES Psychosocial Adjustment Scale total and Depression (tau- $b=-.497$, $N=67$, $p<0.005$, one-tailed) and Anxiety (tau- $b=-.493$, $N=67$, $p<0.005$ one-tailed).

As such the hypothesis was accepted.

3.4 Additional Analyses

In this section variables which previous research had suggested were associated with psychological distress and/or adjustment problems were investigated. As these were exploratory analyses, two-tailed testing was used throughout. A summary of the additional analyses is presented at the end of this section.

3.4.1 Patient Characteristics

3.4.1.1 Age.

There was no significant correlation between Age and Depression score (tau $b = -.002$, $N=67$, $p=0.978$, two tailed), Anxiety score (tau $b = .011$, $N=67$, $p=0.896$, two tailed) or Psychosocial Adjustment ($r = -.062$, $n=67$, $p=0.619$, two tailed).

It was concluded that age at testing did not significantly influence adjustment to amputation.

3.4.1.2 Sex of participant

Table 18 Differences between male and female amputees on measures of distress.

	Men (n=51)				Women (n=16)				Statistic	Sig.
	Mean	s.d.	Median	Range	Mean	s.d.	Median	Range		
Psychosocial Adjustment Scale Total	53.08	10.13	53.0	32-75	43.56	7.16	45.0	25-53	t=3.485***	.001
HADS Anxiety	5.73	4.40	5.0	0-14	8.25	4.73	8.5	0-15	U=283.000	.065
HADS Depression	4.29	3.49	4.0	0-12	6.06	4.28	5.0	1-17	U=303.500	.122

Notes

1. On the Psychosocial Adjustment Scale higher scores are indicative of better adjustment.
2. An Independent Groups t-test was used to assess differences in Psychosocial Adjustment Scale Total scores as this variable met the assumptions for parametric tests (see Appendix L) and Levene's test for equality of variance indicated that there was equality ($F=2.134$, $p=.149$).

*** Correlation is significant at the .001 level (2-tailed)

As illustrated in Table 18 there was no significant difference between male and female amputees on levels of Depression or Anxiety, although there was a tendency for women to be more anxious than men. Interestingly in terms of clinical caseness, 44% of women had Anxiety scores which were higher than the threshold for case detection compared to 25% of men. Prevalence rates of clinically significant levels of Depression were very similar for men (13.7%) and women (12.5%).

There was a significant difference between men and women in terms of Psychosocial Adjustment. The mean Psychosocial Adjustment score was higher for men than women, indicating that men were better adjusted than women. As illustrated in Table 19 below, further analysis indicated that men were significantly better adjusted to amputation than women on every factor within the Psychosocial Adjustment subscale.

Table 19 Differences between men and women on the subscales within the TAPES

Psychosocial Adjustment Scale

	Men (n=51)				Women (n=16)				Mann-Whitney U test	
	Mean	S.d.	Median	Range	Mean	S.d.	Median	Range	U value	Sig.
General Adjustment	19.80	4.18	20	8-25	16.56	4.44	17	8-25	233.000**	0.010
Social Adjustment	21.22	3.48	21	12-25	19.06	3.62	18.5	12-25	264.000*	0.032
Adjustment to Limitation	12.06	5.33	10	5-25	7.94	3.07	7	5-14	197.000**	0.002

Notes

1. On the Psychosocial Adjustment Scale higher scores are indicative of better adjustment.

* Correlation is significant at the .05 level (2-tailed)

** Correlation is significant at the .01 level (2-tailed)

It was therefore concluded that whilst there was no impact of gender on Anxiety or Depression, men reported better Psychosocial Adjustment than women and this was particularly so for the Adjustment to Limitation subscale.

3.4.2 Disability Factors*3.4.2.1 Level of amputation.*

Using the Kruskal-Wallis test, there was no significant effect of level of amputation on either Depression scores ($\chi^2 = 0.64$, $df=2$, $p=0.969$) or on Anxiety scores ($\chi^2 = 1.169$, $df=2$, $p=0.557$).

Using a one-way between subjects ANOVA, there was no significant effect of level of amputation on Psychosocial Adjustment as measured by the TAPES ($F_{(2,64)} = 0.816$, $p=0.447$)

In summary level of amputation did not have a significant impact on level of distress or Psychosocial Adjustment.

3.4.2.2 Cause of amputation.

Using the Kruskal-Wallis test there was no significant effect of cause of amputation on either Depression ($\chi^2 = 6.444$, $df=4$, $p=0.168$) or Anxiety ($\chi^2 = 2.096$, $df=4$, $p=0.718$).

Using a one-way between subjects ANOVA there was no significant effect of cause of amputation on Psychosocial Adjustment as measured by the TAPES ($F_{(4,62)} = 1.834$, $p=0.134$).

In summary, there was no significant impact of cause of amputation on levels of distress or psychosocial adjustment.

3.4.2.3 Time since amputation.

There was no significant correlation between time since amputation and Anxiety score (tau $b = -.060$, $N=67$, $p=0.490$, two tailed), Depression score (tau $b = -.080$, $N=67$, $p=0.359$, two tailed) or Psychosocial Adjustment as measured by the TAPES ($r = 0.181$, $n=67$, $p=0.143$, two tailed).

It was therefore concluded that time since amputation did not significantly influence level of distress or psychosocial adjustment problems.

3.4.2.4 Hours per day wearing a prosthesis.

There was no significant correlation between the number of hours per day that an individual wore their prosthesis and Anxiety score (tau $b = -.142$, $N=67$, $p=0.116$, two tailed). However there was a low negative correlation between the number of hours an individual wore their prosthesis per day and Depression score (tau $b = -.222$, $N=67$, $p=0.015$, two tailed). There was also a significant low correlation between the number of hours an individual wore their prosthesis per day and their total score on the Psychosocial Adjustment scale of the TAPES (tau $b = .336$, $N=67$, $p<0.0005$, two tailed).

It was therefore concluded that people who wore their prosthesis for greater periods of time were less depressed and had fewer difficulties with Psychosocial Adjustment. However the amount of time per day an individual wore their prosthesis did not have a significant impact on Anxiety.

3.4.3 Summary of Additional Analyses

In the current study age at testing, level of amputation, cause of amputation and time since amputation were not found to have a significant impact on levels of Anxiety, Depression or Psychosocial Adjustment to amputation. Sex of the participant had an impact on Psychosocial Adjustment to amputation, with men tending to be better adjusted than women but sex of participant did not influence levels of Anxiety or Depression. The number of hours per day that the individual wore their prosthesis for was significantly correlated with Depression and Psychosocial Adjustment but not with Anxiety.

4. DISCUSSION

The Discussion section is structured such that firstly the characteristics of the sample are presented and then the data regarding the prevalence of distress are reviewed and compared to previous research findings. Following this, the results of the analyses are discussed within the context of previous research and theory. This is then followed by a discussion of the clinical implications of the findings. Finally strengths and limitations of the study are reviewed and areas for future research are highlighted.

4.1 Characteristics of the sample

The 67 participants in this study has a mean age of 64 years and all reported that their ethnic group was white British with the exception of two participants who were Indian. In terms of age, gender and reason for amputation the sample appeared to be representative when compared to UK patterns reported in a recent epidemiological study of lower limb amputation (The Global Lower Extremity Amputation Study Group, 2000). Whilst The Global Lower Extremity Amputation Study Group documented all medical conditions associated with the amputation and thus found each participant could report more than one condition, the current study gathered information only on the primary reason for amputation and as such it was not possible to do a direct comparison of primary reason for amputation. However despite these methodological differences it is of note that both studies found that vascular disease was most commonly associated with amputation and the second most commonly associated condition was diabetes. Table 20 below compares the age and gender of the current sample with the data gathered in the UK by The Global Lower Extremity Amputation Study Group.

Table 20 Comparison of age and gender of the sample with UK data from a recent epidemiological study (The Global Lower Extremity Amputation Study Group, 2000)

	Age (%)			Gender (%)	
	20-39	40-59	60+	Men	Women
Current study	6	28.4	65.6	76	24
UK epidemiological data	4.7	31.6	63.7	71	29

All participants had had their amputation within the last five years and had been fitted with a prosthesis. In general prosthesis use was high, with a median use of 14 hours per day. Most people reported being satisfied with their prosthesis and this was particularly so in terms of satisfaction with function. High prosthesis satisfaction was expected as a previous study which used a 6-item prosthesis satisfaction scale in which subjects were asked to rate their level of satisfaction with the comfort, weight, colour, shape, usefulness and noise of their current prosthesis indicated that satisfaction was on average high (Williamson et al., 1994).

Despite relatively high levels of prosthesis satisfaction, most participants felt very restricted in terms of functional activity and athletic activity. However, in terms of social activity the majority of participants felt that they were only limited a little.

Of the 67 participants, 45 (67.2%) reported that they had experienced PLP at least once during the previous week and just under half of the participants (n=31, 46.3%) indicated that they had experienced RLP during the past week. These prevalence rates are very similar to those found by Gallagher, Allen & MacLachlan (2001) who used the same measure and reported that of their 104 participants, 69.2% experienced PLP and 48.1% reported RLP.

Within the current sample 40 (59.7%) reported additional medical conditions. Of those 40, 25 (62.5%) reported associated pain.

4.2 Prevalence of distress

4.2.1 Anxiety

In the present study of 67 lower limb amputees there was an anxiety prevalence rate of 43.3% using the HADS cut-off score of 8 as recommended as the threshold for case detection by the authors (Snaith & Zigmond, 1994). However the prevalence rate was reduced to 29.9% when the more conservative threshold of 10 as suggested by Crawford et al. (2001) was applied.

In their epidemiological survey of adults drawn from the general population (N=1792) Crawford et al. (2001) found an anxiety prevalence rate of 12.6% using this higher

threshold. This finding and the results of the present study together suggest that anxiety levels are higher in the amputee population than in an adult community sample. However, this conclusion may be ill-founded as there are a number of significant differences between the two samples. For example, the mean age of the community group (41.5 years, s.d. 15.9) was considerably less than that of the current study sample (mean age 64.21 years, s.d. 14.36). Furthermore the community sample consisted of roughly equal numbers of men and women whereas the amputee sample consisted of far more men (76 %) than women (24%). It is interesting to note that in the community sample women obtained significantly higher scores than men on the anxiety scale (Crawford et al.) but there was no difference in anxiety level between men and women in the current study. There is little information available about the prevalence of anxiety disorders in the elderly population. In his review of anxiety in older adults, Lindesay (1995) concluded that the prevalence of anxiety decreased in elderly (age 65+) groups. This would therefore suggest that anxiety was more common in the current amputee sample than would be expected in a general population sample of older adults.

In a review of the use of the HADS, Herrmann (1997) reported that studies which have used a cut-off score of 10 to detect anxiety, have reported anxiety prevalence rates of 10-22% for groups of patients with various different physical health conditions. He also noted that people with chronic pain tend to have high levels of anxiety, with prevalence rates of 36% for back pain patients and 39% for fibromyalgia patients. In the current study patients who experienced PLP reported more severe symptoms of anxiety than non-sufferers and the prevalence of clinically significant anxiety was greater in patients who reported RLP than in a group of non-sufferers. These findings suggest that the anxiety levels found in the current study are comparable to those found in other groups of individuals with physical health problems and pain conditions.

Only one previous study had reported the prevalence of anxiety in an amputee population and that also used the HADS (Fisher & Hanspal, 1998). This study was carried out in England and as with the current study, the HADS was completed using an interview format. In their sample (N=93) they found a mean anxiety score of 3.9 and stated that 11 % of participants fell in the clinical range for anxiety, although they failed to state which cut-off level was used. Even if it is assumed that they used the higher cut-off, there is still a considerable difference in the results of these two studies and this discrepancy is difficult

to account for. The distribution of factors such as age, sex and reason for amputation were similar across the two studies, although the average time since amputation was much larger in Fisher & Hanspal's study (mean=9 years 8 months) compared to the current study (mean=2 years 9 months). Whilst the body of literature consistently suggests that depression is not related to time since amputation there has been little research on the impact of time since amputation on anxiety. However both these studies concluded that there was no association between time since amputation and anxiety so it is doubtful that time since amputation was the main reason for such variation between samples. It is possible that the recruitment methods used could explain the results as Fisher & Hanspal's study stated that their sample consisted of 93 consecutive patients attending a prosthetic rehabilitation clinic which implies that no-one declined to partake. In the current study participants were required to opt-in and it is possible that those who felt that they were well-adjusted declined to take part, leading to a higher prevalence of Anxiety in the sample than would have been the case if everyone had taken part. Another possible explanation relates to the difference in phantom limb pain; in their sample Fisher & Hanspal reported that only 31% experienced PLP compared to 67.2% in the current study. Furthermore, in their study the majority of participants rated their pain as 'mild' whilst in the current study people tended to report more severe levels of pain, with only a small proportion (10.4%) describing their pain as 'mild'. This is an interesting suggestion, as Fisher & Hanspal did not find a difference in anxiety between groups who experienced PLP and non-sufferers, which is in contrast to the finding of the current study.

4.2.2 Depression

Within this study depression was less prevalent than anxiety; only 12 (17.9%) participants obtained scores above the range identified as the threshold for case detection for depression using the criteria recommended by Snaith & Zigmond (1994). When the more conservative threshold of 10 suggested by Crawford et al. (2001) was applied this was slightly reduced to 9 (13.4%).

The depression rate found in the current study can be compared to a 3.6% prevalence rate detected in a general adult population community-based sample (N=1792) tested with the same instrument and cut-off score (Crawford et al., 2001). Together these studies suggest that depression levels are much higher in the amputee population than in a general community sample. However it is important to be aware of the difficulties inherent in

comparing these samples which are discussed above in section 4.2.1. Indeed community-based studies using a range of measures have reported depression prevalence rates of 10-15% amongst elderly populations (Baldwin, 1995; Phifer & Murrell, 1986, cited in Rybarczyk et al., 1992). It would therefore appear that within the current study, depression was not significantly more common than in an older adult community based sample.

In a review of the use of the HADS, Herrmann (1997) reported that using a cut-off score of 8, patients with a range of different physical diseases had depression prevalence rates of 17-27%. He also noted that those with chronic pain had high levels of depression, with prevalence rates of 29% for back pain patients and 39% for fibromyalgia patients. This suggests that the depression levels found in the current study are quite low compared to those found in other groups with physical health problems. Furthermore it is interesting that in the current study there was no difference in prevalence of clinically significant depression between groups who experienced pain (be it PLP or RLP) and those who did not experience pain.

Compared to the findings of previous studies of depression rates in amputee samples, the prevalence rates in the current study are quite low. In one of the few studies that have investigated Depression amongst amputees using the HADS, Carter (2000) focussed on lower limb amputee's aged 60 and over who had had their amputation within the last 30 months. She found that 45% fell within the clinically depressed range when the cut-off score of 8 was used. The discrepancy between her results and those of the current study could be due to the difference in average time since amputation (16 months in her study compared to 33 months in the current study). However, as studies have consistently suggested that time since amputation has little bearing on adjustment, this is unlikely to be the main reason. A more plausible explanation is due to the difference in prosthesis use; in her sample (N=58), 45 had a prosthesis and only 35 wore it, whereas in the current study everyone had a prosthesis. In the current study greater prosthesis use was associated with better adjustment.

In stark contrast to Carter's (2000) finding, Fisher & Hanspal (1998) used the HADS to detect depression and found a mean depression score of 2.9 with only one individual falling in the clinical range for depression, although unfortunately they did not state which cut-off they used. It is difficult to account for the discrepancy between these results and

those of the current study as the patient characteristics were similar, with the exception of time since amputation which the present study as well as previous studies have suggested has little if any impact on depression. As discussed in section 4.2.1 one possible explanation for the differences between these two studies was that the current study required participants to opt-in and perhaps those who felt that they were well-adjusted declined to take part, leading to a higher depression prevalence rate than would have been the case if everyone took part. However this is an unlikely explanation as other studies of depression in amputee populations which have reported high opt-in rates have documented relatively high levels of depression (e.g. Rybarczyk et al., 1992, 1995; Williamson et al., 1994). Other explanations relate to prosthesis use and satisfaction as the current study indicated that greater prosthesis use and satisfaction was associated with better adjustment. Unfortunately Fisher & Hanspal do not give any indication of prosthesis use or prosthesis satisfaction in their sample so it is difficult to determine if these factors may account for the difference in prevalence rates.

Other amputee studies that have used standardised questionnaires to investigate levels of depression have reported prevalence rates of 20.8%-28% (Rybarczyk et al., 1992, 1995; Williamson et al., 1994). Indeed one early study suggested that at least 50% of the sample were at least mildly depressed in terms of scores on the BDI (Frank et al., 1984). The only study to report using clinical interviews to detect depression reported a prevalence rate of 35% (Kashani et al., 1983). It therefore appears that even when using the lower cut-off score, the prevalence of depression in this study was lower than that reported in most previous studies. One possible explanation of this is that the present study specifically targeted people who wore a prosthesis and who were perhaps more active than those who did not use a prosthesis. As both the current study and previous research (Williamson et al., 1994) have suggested that self-rated activity restriction is positively associated with psychological distress and difficulties with psychosocial adjustment to amputation it is perhaps not surprising that distress is lower in the current sample.

4.3 Relating the Results to the Literature

4.3.1 The Hypotheses

Hypothesis One: Levels of psychological distress will be positively associated with Self-Consciousness.

Discussion

As predicted, in this study Public Self-Consciousness was positively associated with measures of both Anxiety and Depression. Furthermore Public Self-Consciousness was negatively correlated with Psychosocial Adjustment to amputation. This negative correlation was expected, as a high score on the Psychosocial Adjustment Scale was indicative of a high level of adjustment. Together these results indicate that people who exhibited high Public Self-Consciousness were more likely to be distressed and were more likely to have problems with Psychosocial Adjustment to amputation. Unsurprisingly Social Anxiety, which is often considered to be a by-product of Public Self-Consciousness, was also significantly correlated with all of the outcome variables.

These results were predicted as Public Self-Consciousness is a measure of how inclined the individual is to attend to aspects of the self that are easily accessible to public scrutiny and from which others can readily form impressions and evaluations. As such those high in Public Self-Consciousness are keener to avoid disapproval and rejection and are more concerned about their physical appearance and thus more likely to be disturbed if their appearance does not conform to the model endorsed by society. Therefore it is likely that limb amputation is especially distressing for those with high Public Self-Consciousness. Furthermore it replicates previous studies that have found that being uncomfortable with social contacts involving acknowledgement of their amputation or prosthesis was a mediator of psychological adjustment problems (Rybarczyk et al., 1992). However as this was an exploratory study employing a correlational design it is important to note that there was no evidence that higher levels of Public Self-Consciousness preceded psychological distress. It is equally plausible that people become more Publicly Self-Conscious following an amputation. Further research could usefully attempt to establish if levels of Self-Consciousness change following amputation.

Only one other study has investigated Self-Consciousness in the amputee population. In her sample of older adults (mean age =69 years) Williamson (1995) found that, regardless of type of amputation, amputees high in Public Self-Consciousness reported high levels of activity restriction in a variety of domains. In other words, there was an increased risk for functional disability following amputation for those with high Public Self-Consciousness. Furthermore high levels of Public Self-Consciousness were directly related to greater feelings of amputation-related public discomfort and vulnerability. However in the current

study, Public Self-Consciousness was not significantly associated with Activity Restriction. One possible explanation for the difference in results is that the Activity Restriction measure used by Williamson included a high number of activities which would naturally take place in the presence of others, for example “caring for others”, “shopping with family or friends” and “maintaining friendships”. Although the measure used in the current study did include some similar items such as “maintaining friendships”, for other items such as “climbing flights of stairs” there was no indication that other people would be present. Had the current study used a measure in which it was explicitly stated that other people would be present, an association may have been found between Public Self-Consciousness and Activity Restriction.

In contrast to the finding regarding Public Self-Consciousness, Private Self-Consciousness was not associated with distress or difficulties with Psychosocial Adjustment to amputation. This finding is puzzling as there is a considerable body of literature associating this factor with a wide range of pathological states including both Anxiety and Depression (See Wells & Mathews, 1994 for a review). One possible explanation relates to the impact that Private Self-Consciousness may have on social support, a factor that has been negatively correlated with Depression in previous research amongst lower limb amputees (Rybarczyk et al., 1992; Williamson et al., 1994). As Private Self-Consciousness represents the extent to which individuals have a tendency to focus on the psychological aspects of themselves such as their thoughts, moods and attitudes, it is reasonable to suggest that compared to those with low Private Self-Consciousness, such individuals have a better understanding of themselves. Research has shown that people high in Private Self-Consciousness are more likely to reveal private self-aspects to their friends and romantic partners and this self-disclosure in turn reduces loneliness and increases relationship satisfaction (Franzoi, Davis & Young, 1985). This research therefore suggests that habitual self-attention can facilitate an intimate social sharing that strengthens close relationships. It is therefore likely that someone who exhibits high Private Self-Consciousness may have better social support, which has been shown to be a protective factor against distress amongst an amputee population.

As people who have high Private Self-Consciousness are more aware of their own moods, another explanation for these results could be that perhaps they are more likely to make attempts to change their mood through self-help techniques or by seeking out other

support. Unfortunately the current study did not gather data on whether they had sought out any support so it was not possible to test out this hypothesis. This is therefore an area that warrants further investigation.

Hypothesis Two: Those who are more Self-Conscious will be more invested in their appearance and this is associated with increased psychological distress and more difficulties with psychosocial adjustment to amputation.

2. a) Those who are more Self-Conscious are more invested in their appearance.

In this study there was little evidence to suggest that Self-Consciousness is associated with appearance-related cognitions as there was only one significant correlation, which was between Public Self-Consciousness and Body Image Vulnerability, and even this correlation was weak. These results were unexpected as if an individual is schematic for appearance, it was predicted that the person would be more focused on physical appearance and self-presentations in social situations (and vice versa).

The lack of association between Self-Consciousness and appearance-related cognitions is in contrast to previous research carried out with a group of female students (N=274) which found significant moderate associations between the ASI and Public Self-Consciousness (Cash & Labarge, 1996). One possible explanation for this difference arises from the difference in age in the two groups; in the study carried out by Cash & Labarge the mean age of the sample was 22.4 years (s.d. 5.7), compared to a mean age of 64.21 years (s.d. 14.36) in the current study. Furthermore Cash & Labarge used an exclusively female population whereas the current study contained more men than women. In the body image literature there is evidence to suggest that women tend to be more concerned about appearance than men and that both men and women are less concerned with their body image as they get older (Cash & Pruzinsky, 1990).

2. b) Investment in appearance will be positively associated with psychological distress and difficulties with psychosocial adjustment to amputation.

As predicted, in the current study the extent to which someone was appearance schematic was positively associated with psychological problems and difficulties with Psychosocial Adjustment to amputation. In particular the Body Image Vulnerability subscale, which

assesses the individual's assumptions that their appearance is inherently defective and socially unacceptable, correlated significantly with distress and problems with Psychosocial Adjustment to amputation.

This was to be expected as in a female student population Cash & Labarge (1996) found that the extent to which someone was appearance schematic was correlated moderately with Depressive symptoms as assessed by the BDI. In the same study they also reported that higher levels of investment in appearance were related to poorer social self-esteem and more social-evaluative Anxiety.

Hypothesis Three: Private Self-Consciousness will positively correlate with self-reported intensity of pain (including PLP, RLP and pain due to other medical conditions).

Despite the claim by Buss (1980) that Private Self-focus intensifies pain, in this study there was no evidence to suggest that intensity of pain was associated with Private Self-Consciousness.

Hypothesis Four: People who experience Phantom Limb Pain (PLP) will be more likely to experience psychological distress and difficulties with psychosocial adjustment to amputation.

The results supported this hypothesis as people who experienced PLP had higher scores on Anxiety and Depression measures than those who did not have PLP. Those who had PLP also reported poorer Psychosocial Adjustment to their amputation. This finding is in line with the findings of several other studies (e.g. Pucher, Kicking & Frischenschlager, 1999; Lindesay, 1985). However the results contrast with those of Fisher & Hanspal (1998) and Carter (2000) who found no relationship between the experience of pain and emotional distress as assessed by the HADS. One possible explanation for the lack of relationship between distress and PLP in the study carried out by Fisher & Hanspal is that in their study levels of distress were extremely low with only one individual scoring in the clinical range for depression and ten scoring above the cut-off for anxiety.

Hypothesis Five: People who experience Residual Limb Pain (RLP) will be more likely to experience psychological distress and difficulties with psychosocial adjustment to amputation.

In this study participants who experienced RLP reported higher levels of Depressive symptomology than people who did not experience RLP but in terms of Anxiety and Psychosocial Adjustment there was no difference between these two groups. The current findings are in contrast to those of the only other study to have investigated RLP and distress which reported that RLP was related to both Depression and Anxiety (Sriwatanakul et al., 1982).

Hypothesis Six: Amputees who report additional health problems are more likely to report psychological distress.

The results of the study supported this hypothesis as those with additional health problems had higher levels of Anxiety and more difficulties with Psychosocial Adjustment to amputation than those who did not have additional health problems. These results were in line with previous research across a range of different health problems and types of disabilities which has consistently suggested that these groups are more likely to experience psychological distress than healthy controls taken from the general population (Herrmann, 1997).

Hypothesis Seven: Self-ratings of health will be negatively associated with levels of psychological distress

In the current study perceived health was significantly negatively correlated with level of Anxiety and Depression whilst there was a positive association with Psychosocial Adjustment. The positive correlation with Psychosocial Adjustment was expected, as higher scores on this scale are indicative of better adjustment. Together these results suggest that those who perceive their health as poor are more likely to experience distress and problems adjusting to their amputation. These findings replicate those of Rybarczyk et al. (1992).

Hypothesis Eight: High levels of self-rated activity restriction will be associated with higher levels of psychological distress and more difficulties with psychosocial adjustment to amputation.

There was evidence to accept this hypothesis. This was expected as in a previous study Williamson et al. (1994) had found that there was a significant positive correlation between restriction of normal activities and symptoms of Depression. It is however important to bear in mind that for some individuals functioning may have been compromised prior to their amputation. Furthermore is important to note that type of amputation (i.e. bilateral, above-knee or below-knee amputation) did not make a significant impact on activity restriction. It would therefore appear that it is psychological distress, rather than disability per se which determines activity restriction, although caution must be taken in this causal interpretation due to the use of a correlational design.

Hypothesis Nine: Prosthesis satisfaction will be negatively associated with levels of distress and psychosocial adjustment problems.

In this study the Prosthesis Satisfaction was found to be negatively associated with Anxiety and Depression. In addition there was a positive correlation between Prosthesis Satisfaction and Psychosocial Adjustment, indicating that those who were more satisfied with their prosthesis also reported better Psychosocial Adjustment. These results were expected as in a previous American study Williamson et al. (1994) reported that Prosthesis Satisfaction was on average high and was negatively correlated with Depressive symptomology as assessed by the CES-D. It is interesting to note that in the current study quite a high number of participants (n=25, 37.5%) reported that they were dissatisfied or very dissatisfied with the weight of their prosthesis. As satisfaction with the weight of prosthesis was significantly correlated with measures of distress this is an issue which warrants further research attention. Education regarding the fact that the actual weight of the prosthesis is often the same as the amputated limb and explanations about the need for this, such as the limb needing to be strong enough to support their body weight, may help to decrease dissatisfaction.

Hypothesis Ten: Those who feel more responsible for needing their amputation are likely to report higher levels of psychological distress and more difficulties with psychosocial adjustment to amputation.

In this study there was no evidence to suggest that Perceived Responsibility was associated with adjustment. This is in contrast to other health psychology research which has found that high self-blame/responsibility has been associated with depression and poor adjustment in patients with a variety of conditions including pain (Williams, Robinson, & Geisser, 1994), renal disease (Rich, Smith, & Christensen, 1999) and HIV (Watts, 2001). It is possible that the reason no association was found in the current study was that there was relatively little variance in the extent to which participants felt responsible, with the majority (n=40, 59.7%) reporting that they felt not at all responsible for their amputation.

Hypothesis Eleven: Self-ratings of psychosocial adjustment to amputation will be negatively associated with levels of distress detected on more global and well-standardised measures used to assess distress (HADS).

There were significant negative correlations between the TAPES Psychosocial Adjustment Scale total and both subscales of the HADS. This provides evidence for construct validity for the TAPES Psychosocial Adjustment Scale.

4.3.2 Additional Analyses

4.3.2.1 Patient characteristics.

In the current study age at testing was not associated with Anxiety, Depression or Psychosocial Adjustment. This replicates the findings of Rybarczyk and colleagues (Rybarczyk et al., 1992, 1995). Gender however was found to have an impact on adjustment, with men reporting better psychosocial adjustment to amputation than women although there were no differences in levels of symptoms of Anxiety and Depression. This was in agreement with several previous studies which have failed to find a relationship between gender and depression (Rybarczyk et al., 1992, 1995; Williamson et al., 1994) but in contrast with the findings of Kashani et al. (1983) who reported that women were more likely to be depressed than men.

4.3.2.2 Disability factors.

In this study level of amputation did not have a significant impact on Anxiety, Depression or Psychosocial Adjustment. This was expected as there is a large body of literature which indicates that there is no significant relationship between level of amputation and psychosocial distress (e.g. Kashani et al., 1983; O'Toole, Goldberg, & Ryan, 1985; Williamson et al., 1994; Rybarczyk et al., 1995). Similarly as in previous studies (e.g. Thompson & Haran, 1983; Rybarczyk et al., 1992; Fisher & Hanspal, 1998), time since amputation was not associated with distress or psychosocial adjustment to amputation. Interestingly a couple of early studies (Parkes, 1975; MacBride et al., 1980) suggested that there was a relationship, with people tending to be most distressed later in the rehabilitation process. One possible explanation for these differences is that people are now encouraged to be much more open about how they are feeling emotionally and as such participants in recent studies may be more able to report their distress at an early stage which was not the case in the older studies. Furthermore in the last couple of decades there has been increased opportunity for ongoing peer support through national organisations such as The Limbless Association or regional support group. Such support may help to decrease distress in the long term.

Furthermore in the current study there was no significant difference in adjustment between groups of participants who had had their amputations for different reasons, a finding well established in previous research (Kashani et al., 1983; Rybarczyk et al., 1992, 1995; Williamson et al., 1994). However it is noteworthy that the primary reason for amputation was provided by the participants themselves as the researcher did not have access to medical notes. It is therefore possible that this data was not entirely reliable and as such the result must be interpreted in caution.

One variable which had not been reported in previous research was hours per day the individual wore their prosthesis for. In the current study the amount of time the individual wore their prosthesis for was associated with distress and adjustment to amputation. Those who wore their prosthesis for greater periods of time had better psychosocial adjustment and lower levels of depression. Presumably those who wear their prosthesis more are less functionally disabled than those who wear their prosthesis for shorter periods of time.

4.4 Clinical implications

4.4.1 The need for regular screening for distress

With an incidence rate of 5-26 per 100 000 per year in the UK, (The Global Lower Extremity Group, 2000), lower limb amputation is a relatively common cause of physical disability within the general population. The finding that anxiety is more common amongst amputees than would be expected in a matched community sample underscores the need for mental-health practitioners to pay greater attention to this group.

The current study replicated previous research which had found that the length of time since the amputation does not significantly influence distress. This highlights the need for clinicians to have regular contact with amputees over quite a long time period. As amputees usually attend the artificial limb and appliance centre at least once a year to have their prosthesis serviced, it would be sensible to use this opportunity to carry out routine screenings for distress. Whilst previous studies have reported relatively high prevalence rates for depression, this is the first study to document the prevalence of anxiety in this population. The high levels of anxiety detected draw attention to the need to screen amputees for both anxiety and depression.

The current study indicates that certain factors are associated with distress in this population. For example, patients who have high levels of Public Self-Consciousness, strong beliefs about the importance of appearance, pain, high levels of activity restriction or low prosthesis use are more likely to experience psychological distress. Therefore, in addition to a routine screening of mood, it may be advantageous to regularly assess for those factors which have been associated with distress, as these factors may serve as an early warning of poor psychological adjustment and the need for intervention.

4.4.2 The need for greater support

If distress is detected, mechanisms need to be in place for a referral to a suitable support agency. In the current study a counsellor was available at one centre and amputees were able to self-refer to this service. However, informal qualitative data suggested that many of those who were distressed did not feel they had received enough information about support agencies. There was no regular Clinical Psychology input to either of the centres in the current study and whilst the Medical Consultants were able to make referrals to the local

Clinical Psychology services, this rarely happened, as they were aware that these services had lengthy waiting lists. Given the relatively high prevalence of distress in this population there may be a case for the provision of dedicated Clinical Psychology time into the artificial limb and appliances centres. This time could be well used in providing both individual support and group treatments.

4.4.3 Treatment Strategies

In terms of treatment strategies, cognitive behavioural treatments for anxiety are well established and have good support for their efficacy (Roth & Fonagy, 1996). The current study highlights that those who have stronger beliefs about the importance of appearance are more likely to be distressed. Therefore in this population particular targets for intervention would be appearance-related beliefs. Recent research on the cognitive-behavioural treatment of body-dissatisfied women (Grant & Cash 1995) has indicated that it is possible to change appearance-related schemas through clinical intervention. In their study there was a statistically and clinically significant weakening of dysfunctional appearance assumptions after treatment and at 2 month follow up. It is therefore possible that a similar form of treatment could be devised for amputees.

Another area that may be usefully explored in treatment is whether anxiety contributes to activity restriction, for example people may avoid going out because they have concerns about falling. In such cases people may benefit from a graded activity programme to help them build up their confidence and test out the evidence for their beliefs. Of course it may be that the individual is very unsteady when using their artificial limb(s) and so the risk of falling is quite high. In such cases the individual may benefit from the use of additional mobility aids such as walking sticks or tripods. Given that activity restriction was so strongly associated with distress in the current study, it is vital that all those involved in providing services to amputees work together to minimise restriction. During the research interviews several participants commented that they had experienced lengthy delays in terms of having home adaptations and as such they felt restricted even in their own homes.

Within the current study amputation-related pain was associated with greater levels of distress. Clinical Psychologists could therefore have a role in terms of offering strategies to help patients reduce and manage their pain. Sherman (1997) reviewed a wide range of possible treatment options specifically for PLP, although he noted that long-term success

was often poor. Patients may also benefit from more general pain management strategies such as pacing activities, distraction and relaxation.

In addition to the provision of formal therapeutic support, there may also be a role for Clinical Psychologists in facilitating peer support groups for amputees. Several participants in this study indicated that they would have liked the opportunity to meet other amputees. Benefits of such a support group would include providing a forum for voicing concerns and the opportunity to learn how others manage their difficulties. Another issue that transpired during the course of the study is that many people felt that their partners and/or close family members would have benefited from the opportunity to talk through their feelings relating to the amputation.

4.5 Strengths and limitations of the study

This section will firstly review the methodology of the study, focussing on the measures, sample and procedure used in the study. Limitations of the analysis will then be discussed.

4.5.1 Measures

The HADS was originally developed for use with medical patients and as such items were chosen to distinguish the effects of physical illness from mood disorders. However despite this there are a number of items on the HADS that may lead to an over-estimation of distress in the amputee population. For example, participants may have disagreed with the statement 'I can sit at ease and feel relaxed' due to the presence of phantom or residual limb pain rather than Anxiety per se. Similarly on the Depression subscale, the statement 'I feel as if I'm slowed down', may have yielded agreement due to difficulties using a prosthesis rather than depressive symptomology. However despite the criticism of overlap between symptomatology and amputation-related issues, the measure remains one of the most popular measures of negative mood in health psychology research. To help to minimise the risk of over-estimation of distress the current study employed the higher cut-off scores for case detection recommended by Crawford et al. (2001).

A further criticism relates to the measurement of psychological distress using only a questionnaire format rather than an interview with a suitably qualified clinician. Several individuals appeared anxious or depressed during the research interview but were not classified as such according to their scores on the HADS. Unfortunately the time frame of

the current study did not permit a clinical interview and as such it was not possible to make a clinical diagnosis. Nonetheless, questionnaire data provided useful clinical information. In future studies it would be interesting to ask people whether they considered themselves anxious or depressed and see how these responses compare with HADS results. Another way of way of checking validity would be to ask a close relative or partner to give a rating of the person's adjustment.

The SCS was selected as a review of the literature indicated that this is the most widely used tool to measure Self-Consciousness. However this measure was initially developed using a college-educated sample and since that time Scheier & Carver (1985) have revised the scale for use with a non-college population. The revised version may have been more appropriate for use in this study as it is unlikely that all the participants had been college educated. However as the measure was administered in an interview format there was the opportunity for participants to ask for clarification if they did not understand an item. Another alternative to the SCS is the Body Consciousness Scale (Miller, Murphy & Buss, 1981) which measures dispositional tendencies to focus on bodily state in non-affective situations. This scale has three subscales: private body-consciousness (attention to internal bodily sensations), public body-consciousness (focus on observable bodily aspects) and body competence (perceived efficacy of bodily action). This tool, particularly the public body-consciousness subscale, could be suitable for future research in the amputee population.

The TAPES was selected as it was considered to be a useful, psychometrically sound instrument which would provide data on a wide range of amputation-specific issues. However, one area which it did not cover is that of social support. As previous research has indicated that social support can influence adjustment (Rybarczyk et al., 1992; Williamson et al., 1994) it is important that this variable is included in future research. A supportive social network may directly facilitate an amputee's ability to participate in social activities such as visiting friends, or functional tasks such as going shopping, by providing both practical assistance (e.g. transportation) and encouragement. This is particularly important as in the current study Activity Restriction was found to have a significant detrimental impact on psychological distress and Psychosocial Adjustment to amputation.

4.5.2 Sample

Although the sample in this study consisted of self-selected volunteers and as such the results have limited generalizability, it should be noted that with regard to age, gender and both level and cause of amputation the sample reflected known UK national patterns (The Global Lower Extremity Amputation Study Group, 2000). Furthermore as it was a multi-centred study, the sample is likely to be a more representative sample of the amputee community than if participants had been recruited from a single artificial limb and appliances centre. Although a strength of the study was that it gave everybody who met the inclusion criteria the opportunity to take part, out of the 158 who were potentially eligible, only 67 did so, representing a 42.4% opt-in rate. This relatively low opt-in rate is surprising as both home visits or transport were offered in an attempt to make it as easy as possible for people to participate. One possible explanation for such a low participation rate was that the study required the individual to make a special trip to the artificial limb and appliance centre; perhaps if the study had taken place over a greater time period people would have been willing to have taken part when they attended for their routine prosthesis service. In addition the provision of a financial incentive/ reimbursement for their time may have encouraged more people to take part. A particular strength of this study is that to the author's knowledge it is the only study to have focused solely on amputees who use a prosthesis.

4.5.3 Procedure

The current study was very ethically sound. In particular it is important to note that the American Psychological Society (1985 cited in Whyte & Niven, 2001) recommend that measuring Depression may be associated with 'suicidal risk' under certain conditions. They advocate that in using such measures mechanisms should be in place to respond to a patient's distress by having appropriate intervention available. This was the case in this study as face-to-face interviews were employed and people who presented as depressed were informed of appropriate support service. Had a postal questionnaire method been used it would have been difficult to conform to these guidelines.

4.5.4 Analysis

The results were surprising in that the prevalence of Depression was much lower than previous studies had suggested. Nevertheless, there was considerable variability amongst

the Depression scores and as such it was still possible to explore factors relating to symptoms of Depression.

When planning the current study it was anticipated that linear multiple-regression would be used in the analysis. The advantage of this form of analysis is that it would have enabled an investigation of the relative impact of the different variables on the three outcome measures. Unfortunately the statistical assumptions of this test were not met and consequently such a procedure was not employed. Simple bivariate correlations were therefore used instead.

Due to the use of a correlation design causal conclusions could not be drawn. For example, the data do not answer the important question of whether Public Self-Consciousness is a factor in the development of psychological distress following amputation or vice versa. A further possibility is that both Public Self-Consciousness and psychological distress are a function of a separate personality variable (e.g. self-esteem). A prospective study that follows patients over several years, beginning at the time of amputation would be required to address these issues.

Furthermore, in cross-sectional studies such as this it is often assumed that the amputation precedes the onset of psychological distress and is therefore significant in its development. However this assumption is contentious as it is possible that symptoms of distress were due to factors other than the amputation itself. Some factors could have pre-dated the amputation, for example, in this study the results indicated that additional health problems were associated with distress and for many people these health problems probably pre-dated the amputation. In addition it is important to bear in mind that other factors which are not related to amputation, such as bereavement, may have precipitated depression. In order to assess the relative impact of amputation on mood, a longitudinal study would be necessary, commencing prior to the amputation. Unfortunately such a study would be limited to those groups of amputees whose amputation could be predicted, such as those with peripheral vascular disease whilst those who require a sudden amputation, as is the case for accident victims, would be excluded.

4.6 Theoretical and research implications

4.6.1 Methodological issues

4.6.1.1 Need for prospective studies.

To date research on adjustment to amputation has employed a cross-sectional design. However there are limitations of such methods in that it is not possible to draw causal conclusions. There is therefore a need for prospective research, beginning at the time of, or indeed before, the amputation. Such studies would allow causal questions to be asked, for example as to what extent distress is precipitated by amputation rather than preceding amputation. Unfortunately such studies would have limited generalizability though as the sample would consist entirely of those for whom amputation could be predicted. Furthermore there is a problem with longitudinal studies in that high levels of mortality and morbidity amongst this population are likely to affect attrition rates.

4.6.1.2 Measurement.

Whilst care was taken to select psychometrically sound instruments, this was particularly difficult when selecting tools to assess amputation-related issues due to the scarcity of such measures. It is therefore important that those tools that have been developed receive further scrutiny in terms of their psychometric properties. For example, in order to establish construct validity for the TAPES Activity Restriction Scale results obtained on this scale could be correlated with those from the Activity Restriction Scale used by Williamson (1995) as this measure has been shown to have good psychometric properties.

A further measurement issue is the need to develop a tool to measure anxiety and depression which is not influenced by factors relating to pain or physical disability. In the absence of such a measure, future research in the amputee population should attempt to validate the responses from questionnaires by asking participants whether they considered themselves anxious or depressed or by asking a close relative or partner to give a rating of the person's adjustment. Alternatively questionnaire data could be supplemented with a qualitative impression formed on the basis of a clinical interview.

4.6.2 Areas in which more research is warranted

The S-REF model (Wells & Mathews, 1994) states that high self-consciousness is associated with distress. In the current study public self-consciousness was associated with

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anxiety, depression and problems with psychosocial adjustment to amputation.

Longitudinal research is needed to establish whether there is any change in public self-consciousness following amputation.

Interestingly in contrast with the prediction of the S-REF model, in the current study private self-consciousness was not associated with distress. This contrasts with previous literature which has linked high private self-focus with various forms of psychopathology including anxiety and depression (e.g. Ingram, 1990; Schwarzer & Wicklund, 1991). Two explanations were put forward for the results of the current study. Firstly it was suggested that perhaps those who exhibit high private self-consciousness may have better social support, which has been shown to be a protective factor against distress amongst an amputee population. The second explanation offered was that perhaps people who exhibit high private self-consciousness are more likely to make attempts to change their mood through self-help techniques or by seeking out other support. In order to test out these hypotheses further research is needed to explore what impact private self-consciousness has upon perceived social satisfaction in this population. In addition research needs to gather data on previous support and attempts at self-help and see if these factors correlates with private self-consciousness.

Wells and Mathews (1994) propose that the mechanism by which self-focus leads to distress is by limiting processing capacity which therefore leads to reduced flexibility in schemas. Based on this model it was hypothesised that amputees who exhibited high self-focus would have difficulty altering their appearance-related beliefs. However in the current study there was no evidence that self-focus was associated with appearance-related beliefs. This finding contradicts the prediction that follows from the S-REF model that those with high self-focus are unable to modify their beliefs.

Although the current study did not find a significant association between self-consciousness and appearance-related beliefs, the extent to which someone was appearance schematic was associated with distress. In particular the Body Image Vulnerability Factor of the ASI which assesses the individual's beliefs that their appearance is inherently defective and socially unacceptable was associated with greater distress. It is possible that interventions designed to alter these beliefs could decrease distress. Controlled trials are needed to establish if this is the case.

Whilst previous studies that have investigated adjustment to amputation have focussed on depression, the current study documented a high prevalence of anxiety amongst this population. There is therefore a need to devote attention to investigating factors that might mediate anxiety in this population.

This study also indicated that PLP and RLP were both associated with distress. Research is needed to try to evaluate the efficacy of clinical interventions designed to help amputees manage this type of pain. Furthermore it is important to try to explore and define factors which influence activity restriction as the current study found a high association between activity restriction and distress.

REFERENCES

- Abrams, D. (1988). Self-consciousness scales for adults and children: Reliability, validity and theoretical significance. *European Journal of Personality*, 2, 11-37. Retrieved July 24, 2001, from the PsycINFO database.
- Akesode, F. A., & Iyang, U. E. (1981). Some social and sexual problems experienced by Nigerians with limb amputation. *Tropical and Geographical Medicine*, 33, 71-74.
- Altabe, M. & Thompson, J. K. (1996). Body image: A cognitive self-schema construct. *Cognitive Therapy and Research*, 20, 171-193.
- American Psychiatric Association. (1980). *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed.). Washington, DC: Author.
- Bakal, D. A. (1979). *Psychology and medicine: Psychological dimensions of health and illness*. New York: Springer.
- Baldwin, R. C. (1995). Affective disorders: Depressive illness. In R. Jacoby, & C. Oppenheimer (Eds.), *Psychiatry in the Elderly* (pp. 676-719). Oxford, England: Oxford Medical Publications.
- Beck, A. T. (1976). *Cognitive therapy and the emotional disorders*. New York: International Universities Press.
- Beck, A. T., Ward, C. H., Mendelson, M., Mock, J., & Erbaugh, J. (1961). An Inventory for measuring depression. *Archives of General Psychiatry*, 4, 561-71.
- Bieliauskas, L. A., & Glantz, R. H. (1989). Depression type in Parkinson's disease. *Journal of Clinical and Experimental Neuropsychology*, 11, 597-604.
- Bodenheimer, C., Kerrigan, A. J., Garber, S. L., & Monga, T. N. (2000). Sexuality in persons with lower extremity amputations. *Disability and Rehabilitation: An International*

References

- Multidisciplinary Journal*, 22, 409-415. Retrieved July 24, 2001, from the PsycINFO database.
- Bowling, A. (1997). *Measuring health: A review of quality of life measurement scales* (2nd ed). Buckingham, England: Open University Press.
- Bradbury, E. (1996). *Counselling people with disfigurement*. Leicester, England: BPS Books.
- Bradley, B. P. (1994). Depression: Treatment. In E. Lindsay, & G. Powell (Eds.), *The Handbook of Clinical Adult Psychology* (2nd ed.). (pp. 110-143). London: Routledge.
- Breakey, J. W. (1997). Body image: The lower-limb amputee. *Journal of Prosthetics and Orthotics*, 9, 58-66.
- Brewin, C. (1982). Adaptive aspects of self-blame in coping with accidental injury. In C. Antaki, & C. Brewin (Eds.), *Attributions and Psychological Change: Applications of Attributional Theories to Clinical and Educational Practice* (pp. 119-134). London: Academic Press Inc.
- Bryman, A., & Cramer, D. (1990). *Quantitative data analysis for social scientists*. London: Routledge.
- Burnkrant, E., & Page, T. J. (1984). A modification of the Fenigstein, Scheier, and Buss Self-Consciousness Scales. *Journal of Personality Assessment*, 48, 629-637.
- Buss, A. H. (1980). *Self-consciousness and social anxiety*. San Francisco: Freeman.
- Caine, D. (1973). Psychological considerations affecting rehabilitation after amputation. *Medical Journal of Australia*, 2, 818-21.
- Carter, R. (2000). *Coping and depression in older adults who have a lower limb amputation*. Unpublished doctoral dissertation, University of Birmingham, England.

References

- Cash, T. F. (1994). The situational inventory of body image dysphoria: Contextual assessment of a negative body image. *The Behaviour Therapist*, 17, 133-134.
- Cash, T. F., & Labarge, A. S. (1996). Development of the Appearance Schemas Inventory: A new cognitive body-image assessment. *Cognitive Therapy and Research*, 20, 37-50.
- Cash, T. F., & Lavalley, D. M. (1997). Cognitive-behavioural body-image therapy: Further evidence of the efficacy of a self-directed program. *Journal of Rational-Emotive and Cognitive Behavioural Therapy*, 15, 281-294.
- Cash, T. F. & Pruzinsky, T. (1990). *Body Images: Development Deviance and Change*. London: Guilford Press.
- Cash, T. F., & Szymanski, M. L. (1995). The development and validation of the body-image ideals questionnaire. *Journal of Personality Assessment*, 64, 466-477.
- Clark, A., & Fallowfield, C. J. (1986). Quality of life measurements in patients with malignant disease: A review. *Journal of the Royal Society of Medicine*, 79, 165-168
- Clark-Carter, D. (1997). *Doing quantitative psychological research, from design to report*. Hove, England: Psychology Press.
- Cramer, K. M. (2000). Comparing the relative fit of various factor models of the Self-Consciousness Scale in two independent samples. *Journal of Personality Assessment*, 75, 295-307.
- Crawford, J. R., Henry, J. D., Crombie, C., & Taylor, E. P. (2001). Normative data for the HADS from a large non-clinical sample. *British Journal of Clinical Psychology*, 40, 429-434.
- Cutson, T. M., & Bongiorno, D. R., (1996). Rehabilitation of the older lower limb amputee: A brief review. *Journal of the American Geriatric Society*, 44, 1388-1393.

References

- Cyr, M., Bourchard, M. A., Valiquette, C., Lecomte, C., et al. (1987). Analyse psychometrique d'une adaptation en langue francaise de l'Echelle de Conscience de Soi. *Canadian Journal of Behavioural Science*, 19, 287-297. Retrieved July 24, 2001, from the PsycINFO database.
- Davis, M. H., & Franzoi, S. L. (1999). Self-awareness and self-consciousness. In V. L. Derlega, B.A. Winstead & W. H. Jones (Eds.), *Personality: Contemporary Therapy and Research* (2nd ed.). (pp. 307-338). Chicago: Nelson-Hall.
- Day, H. J. B. (1981). The assessment and description of amputee activity. *Prosthetics and Orthotics International*, 5, 23.
- Department for Education and Employment. (1995). *Disability Discrimination Act 1995: A consultation on the employment code of practice, guidance on definition of disability and related regulations*. London: Author.
- Dunn, D. S. (1996). Well-being following amputation: Salutory effects of positive meaning, optimism and control. *Rehabilitation Psychology*, 41, 285-302.
- Ebrahim, S., Barer, D., & Nouri, F. (1987). Affective Illness after stroke. *British Journal of Psychiatry*, 151, 52-56.
- Edelmann, R. J. (1994). An introduction to Health Psychology. In E. Lindsay, & G. Powell (Eds.), *The Handbook of Clinical Adult Psychology* (2nd ed.). (pp. 486-513). London: Routledge.
- Elmes, D. G., Kantowitz, B. H., & Roediger, H. L. (1992). *Research methods in Psychology*. (4th ed.). St Paul, USA: West Publishing Company.
- English, A. W. (1989). Psychology of limb loss. *British Medical Journal*, 299, 1287.
- Feinglass, J., Brown, J. L., LoSasso, A., Sohn, M. W., Manheim, L. M., Shah, S. J., & Pearce, W. H. (1999). Rates of lower-extremity amputation and arterial reconstruction in the United States, 1979-1996. *American Journal of Public Health*, 89, 1222-1227.

References

- Fenigstein, A. (1997). Self-Consciousness and its relation to psychological mindedness. In M. McCallum, & W. E. Piper (Eds.), *Psychological mindedness: A contemporary understanding* (pp. 105-131). London: LEA.
- Fenigstein, A., Scheier, M. F., & Buss, A. H. (1975). Public and private self-consciousness: Assessment and theory. *Journal of Consulting and Clinical Psychology*, 43, 522-527.
- Field, A. (2000). *Discovering Statistics using SPSS for Windows*. London: Sage.
- Fisher, K., & Hanspal, R. S. (1998). Phantom pain, anxiety, depression and their relation in consecutive patients with amputated limbs: Case reports. *British Medical Journal*, 316, 903-904.
- Frank, R. G., Kashani, J. H., Kashani, S.R., Wonderlich, S. A., Umlauf, R. L., & Ashkanazi, G. S. (1984). Psychological response to amputation as a function of age and time since amputation. *British Journal of Psychiatry*, 144, 493-497.
- Franzoi, S. L., Davis, M. H., & Young, R. D. (1985). The effects of private self-consciousness and perspective taking on satisfaction in close relationships, *Journal of Personality and Social Psychology*, 48, 1584-1594.
- Freidland, J. F. & McColl, M. (1992). Disability and Depression; Some etiological considerations. *Social Science Medicine*, 34, 395-403.
- Frierson, R. L. & Lippmann, S. B. (1987). Psychiatric consultation for acute amputees: Report of a ten-year experience. *Psychosomatics*, 28, 183-189.
- Gallagher, P. & MacLachlan, M. (2000). Development and psychometric evaluation of the Trinity amputation and prosthesis experience scales (TAPES). *Rehabilitation Psychology*, 45, 130-154.

References

- Gallagher, P., Allen, D., & MacLachlan, M. (2001). Phantom limb pain and residual limb pain following amputation: A descriptive analysis. *Disability and Rehabilitation: An International Multidisciplinary Journal*, 23, 522-530.
- The Global Lower Extremity Amputation Study Group. (2000). Epidemiology of lower extremity amputation in centres in Europe, North America and East Asia. *British Journal of Surgery*, 87, 328-337.
- Goldberg, D. P., & Hillier, V. F. (1979). A scaled version of the General Health Questionnaire. *Psychological Medicine*, 9, 139-145.
- Grant, J. R., & Cash, T. F. (1995). Cognitive-behavioural body-image therapy: Comparative efficacy of group and modest-contact treatments. *Behaviour Therapy*, 26, 69-84.
- Ham, R., & Cotton, L. (1991). *Limb amputation: From aetiology to rehabilitation*. London: Chapman & Hall.
- Hawton, K., Salkovskis, P. M., Kirk, J., & Clark, D. M. (1989). *Cognitive Behavioural Therapy for Psychiatric Problems: A Practical Guide*. Oxford, England: Oxford Medical Publications.
- Heinemann, W. (1979). The assessment of private and public self-consciousness: A German replication. *European Journal of Social Psychology*, 9, 331-337. Retrieved July 24, 2001, from the PsycINFO database.
- Henker, F. O. (1979). Body image conflict following trauma and surgery. *Psychosomatics*, 20, 812-20.
- Herrmann, C. (1997). International experiences with the Hospital Anxiety and Depression Scale- A review of validation data and clinical results. *Journal of Psychosomatic Research*, 42, 17-41.

References

- Hill, A., Niven, C. A., & Knussen, C. (1995). The role of coping in adjustment to phantom limb pain. *Pain*, 62, 79-86.
- Hill, A., Niven, C. A., Knussen, C., & McCreath, S. W. (1995). Rehabilitation outcome in long term amputees. *British Journal of Therapy and Rehabilitation*, 2, 593-598.
- Howell, D. C. (1997). *Statistical Methods for Psychology* (4th ed.). Belmont, U.S.A: Wadsworth.
- Ingram, R. E. (1990). Self-focussed attention in clinical disorders: Reviews and a conceptual model. *Psychological Bulletin*, 107, 156-176.
- Jensen, T., Krebs, B., Nielsen, J., & Rasmussen, P. (1985). Immediate and long-term phantom limb pain in amputees: incidence, clinical characteristics and relationship to pre-amputation limb pain. *Pain*, 21, 267-278.
- Johnston, M., Wright, S., & Weidman, J. (1995). *Measures in Health Psychology: A user's portfolio*. Windsor, England: NFER-Nelson.
- Kashani, J. H., Frank, R. G., Kashani, S. R., Wonderlich, S. A., & Reid, J. C. (1983). Depression among amputees. *Journal of Clinical Psychiatry*, 44, 256-258.
- Katz, J., & Melzack, R. (1990). Pain memories in phantom limbs: Review and clinical observations. *Pain*, 43, 319-336.
- King, N., Carroll, C., Newton, P., & Dornan, T. (2002). "You can't cure it so you have to endure it": The Experience of Adaptation to Diabetic Renal Disease. *Qualitative Health Research*, 12, 329-346.
- Kleck, R. E. (1968). Physical stigma and nonverbal cues emitted in face-to-face interaction. *Human Relations*, 21, 19-28.
- Kleck, R. E., Ono, H., & Hastorf, A. (1966). The effects of physical deviance on face-to-face interaction. *Human Relations*, 19, 425-36.

References

- Lindesay J. E. (1985). Multiple pain complaints in amputees. *Journal of the Royal Society of Medicine*, 78, 432-455.
- Lindesay, J. (1995). Anxiety disorders in the elderly. In R. Jacoby, & C. Oppenheimer (Eds.), *Psychiatry in the Elderly* (pp. 735-757). Oxford, England: Oxford Medical Publications.
- MacBride, A., Rogers, J., Whyllie, B., & Freeman, S. J. J. (1980). Psychosocial factors in the rehabilitation of elderly amputees. *Psychosomatics*, 21, 258-265.
- Mann, A. (1995). Epidemiology. In R. Jacoby, & C. Oppenheimer (Eds.), *Psychiatry in the Elderly* (pp. 89-112). Oxford, England: Oxford Medical Publications.
- Markus, H. (1990). Unresolved issues of self-representation. *Cognitive Therapy and Research*, 14, 241-253.
- Miller, L. C., Murphy, R., & Buss, A. H. (1981). Consciousness of body: Private and public. *Journal of Personality and Social Psychology*, 41, 397-406.
- Mossey, J. M., Mutran, E., Knott, K., & Craik, R. (1989). Determinants of recovery 12 months after hip fracture: The importance of psychosocial factors. *American Journal of Public Health*, 79, 279-286.
- Nikolajsen, L., Ilkjaer, S., Krøner, K., Christensen, J. H., & Jensen, T. S. (1997). The influence of preamputation pain on post amputation stump and phantom pain. *Pain*, 72, 393-405.
- Noble, D., Price, D., & Gilder, R. (1954). Psychiatric disturbance following amputation. *American Journal of Psychiatry*, 110, 609.
- Nystedt, L., & Smari, J. (1989). Assessment of the Fenigstein, Scheier, and Buss Self-Consciousness Scale: A Swedish translation. *Journal of Personality Assessment*, 53, 342-352. Retrieved July 24, 2001, from the PsycINFO database.

References

- O'Toole, D. M., Goldberg, R. T., & Ryan, B. (1985). Functional changes in vascular amputee patients: Evaluation by Barthel Index, PULSES profile, and ESCROW scale. *Archives of Physical Medicine and Rehabilitation*, 66, 508-511.
- Parkes, C. M. (1972). Components of the reaction to loss of a limb, spouse or home. *Journal of Psychosomatic Research*, 16, 343.
- Parkes C. M. (1975). Psychosocial transitions: Comparisons between reactions to loss of a limb and loss of a spouse. *British Journal of Psychiatry*, 127, 204-310.
- Parkes, C. M., & Napier, M. M. (1970). Psychiatric sequelae of amputation. *British Journal of Hospital Medicine*, 7, 610-614.
- Pinzur, M. S., Littooy, F., Daniels, J., Arney, C., Reddy, N. K., Graham, G., & Osterman, H. (1992). Multidisciplinary preoperative assessment and late function in dysvascular amputees. *Clinical Orthopaedics and Related Research*, 281, 239-243.
- Pucher, I., Kicking, W., & Frischenschlager, O. (1999). Coping with amputation and Phantom Limb Pain. *Journal of Psychosomatic Research*, 46, 379-383.
- Radloff, L. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*, 59, 501-504.
- Ramachandran, V. S., Rogers-Ramachandran, D., & Cobb, S. (1995). Touching the phantom limb. *Nature*, 377, 489-90.
- Randall, G. C., Ewalt, J. R., & Blair, H. (1945). Psychiatric reaction to amputation. *Journal of the American Medical Association*, 128, 645-52.
- Rich, M. R., Smith, T. W., & Christensen, A. J. (1999). Attributions and adjustment in end-stage renal disease. *Cognitive Therapy and Research*, 23, 143-158.

References

- Rippere, V. (1994). Depression: Investigation. In E. Lindsay, & G. Powell (Eds.), *The Handbook of Clinical Adult Psychology* (2nd ed.) (pp. 92-109). London: Routledge.
- Robinson, R. G., Starr, L. B., Lipsey, J. R. Rao, R., & Price T. R. (1984). A two-year longitudinal study of post-stroke mood disorders: Dynamic changes in association of variables over the first six months of follow up. *Stroke*, 15, 510-517.
- Roth, A., & Fonagy, P. (1996). *What works for whom? A critical review of psychotherapy research*. London: Guilford Press.
- Rybarczyk, B. D., Nyenhuis, D. L., Nicolas, J. J., Schulz, R., Alioto, R. J., & Blair, C. (1992). Social discomfort and depression in a sample of adults with leg amputations. *Archives of Physical Medicine and Rehabilitation*, 73, 1169-1173.
- Rybarczyk, B., Nyenhuis, D. L., Nicholas, J. J., Cash. S. M., & Kaiser, J. (1995). Body image, perceived social stigma, and the prediction of psychosocial adjustment to leg amputation. *Rehabilitation Psychology*, 40, 95- 110.
- Rybarczyk, B., Nicholas, J. J., & Nyenhuis, D. L. (1997). Coping with leg amputation: Integrating research and clinical practice. *Rehabilitation Psychology*, 42, 241-256.
- Rybarczyk, B., Szymanski, L., & Nicholas, J. (2000). Limb amputation. In R. G. Frank & T. R. Elliott (Eds.), *Handbook of rehabilitation psychology* (pp. 29-47). Washington DC: American Psychological Association.
- Scheier, M. F., & Carver, C. S. (1985). The self-consciousness scale: A revised version for use with general populations. *Journal of Applied Social Psychology*, 15, 687-699.
- Schubert, D. S. P., Taylor, C., Lee, S., Mentari, A., & Tamaklo, W. (1992). Physical consequences of depression in the stroke patient. *General Hospital Psychiatry*, 14, 69-76.
- Schwarzer, R., & Wicklund, R. A. (1991). *Anxiety and self-focused attention*. London: Harwood Academic Publishers.

References

- Sherman, R. A. (1997). *Phantom Pain*. New York: Plenum Press.
- Sherman, R. A., Sherman, C. J., & Parker, L. (1984). Chronic phantom and stump pain among American veterans: Results of a survey. *Pain, 18*, 83-95.
- Shukla, G. D., Sahu, S. C., Tripathi, R. P., & Gupta, D. K. (1982). A psychiatric study of amputees. *British Journal of Psychiatry, 141*, 50-53.
- Snaith R. P., & Zigmond, A. S. (1994). *The HADS Manual*. Windsor, England: NFER-Nelson.
- Snyder, M. L., Kleck, R. E., Strenta, A., & Mentzer, S. J. (1979). Avoidance of the handicapped: An attributional ambiguity analysis. *Journal of Personality and Social Psychology, 37*, 2297-306.
- SPSS Inc. (1999). *Statistical Package for the Social Sciences (Version 10.0)*. Author.
- Sriwatanakul, K., Kelvie, W., & Lasagne, L. (1982). The quantification of pain. *Clinical Pharmacology and Therapeutics, 32*, 143-148.
- Stock, W. A., Okun, M. A., & Benin, M. (1986). The structure of subjective well-being among the elderly. *Psychology of Aging, 1*, 91-102.
- Stewart, A. L., Hays, R. D., & Ware, J. E. (1988). The MOS short-form general health survey: reliability and validity in a patient population. *Medical Care, 26*, 724-735.
- Thompson, J. K. (1990). *Body-image disturbance: Assessment and treatment*. New York: Pergamon Press.
- Thompson, D. M., & Haran, D. (1983). Living with an amputation: The patient. *International Rehabilitation Medicine, 5*, 165-169

References

- Thornhill, H. L., Jones, G. D., Brodzka, W., & VanBockstaele, P. (1986). Bilateral below-knee amputations: Experience with 80 patients. *Archives of Physical Medicine and Rehabilitation*, 67, 159-163.
- Turner, R. G., Scheier, M. F., Carver, C., & Ickes, W. (1977). Correlates of self-consciousness. *Journal of Personality Assessment*, 42, 285-289. Retrieved July 24, 2001, from the PsycINFO database.
- Waites, B., & Zigmond, A. (1999). Psychological impact of amputation. In B. Engstrom & C. Van de Vend (Eds.), *Therapy for amputees*. (pp. 27-39). London: Churchill Livingstone.
- Watts, M. S. (2001). Hope, coping, and psychological adjustment in HIV-infected gay men (immune deficiency). *Dissertation Abstracts International: Section B: The Sciences and Engineering*. 2001 Sep; Vol 62(3-B): 1605. Retrieved May 28, 2002, from the PsycINFO database.
- Weissman, M. M., & Myers, J. K. (1978). Affective disorders in a US urban community. *Archives of General Psychiatry*, 35, 1304-1311.
- Wells, A. & Mathews, G. (1994). *Attention and emotion: A clinical perspective*. Hove, England: LEA.
- White, C. A. (2001). *Cognitive Behavioural Therapy for chronic medical problems: A guide to assessment and treatment in practice*. Chichester, England: Wiley.
- Whyte, A. S., & Niven, C. A. (2001). Psychological distress in amputees with phantom limb pain. *Journal of Pain and Symptom Management*, 22, 938-945.
- Williams, D., Robinson, M. E., & Geisser, M. E. (1994). Pain beliefs: Assessment and utility. *Pain*, 59, 71-78.
- Williamson, G. M. (1995). Restriction of normal activities among older adult amputees: The role of public self-consciousness. *Journal of Clinical Geropsychology*, 1, 229-242.

References

Williamson, G. M., Schultz, R., Bridges, M. W., & Behan, A. M. (1994). Social and psychological factors in adjustment to limb amputation. *Journal of Social Behaviour and Personality*, *9*, 249-68.

Wright, B. A. (1983). *Physical disability: A psychological approach*. New York: Harper & Row.

Zigmond, A. S., & Snaith, R. P. (1983). The Hospital Anxiety and Depression scale. *Acta Psychiatrica Scandinavica*, *67*, 361-70.

Appendix A

The Hospital Anxiety and Depression Scale (HADS)
(Zigmond & Snaith, 1983)

I am interested in how you have been feeling **over the last week**.

Don't take too long over your replies; your immediate reaction to each item will probably be more accurate than a long thought-out response.

1. I feel tense or "wound up":

Most of the time	A lot of the time	From time to time, occasionally	Not at all

2. I still enjoy the things I used to enjoy:

Definitely as much	Not quite so much	Only a little	Hardly at all

3. I get a sort of frightened feeling as if something awful is about to happen:

Very definitely and quite badly	Yes, but not too badly	A little, but it doesn't worry me	Not at all

4. I can laugh and see the funny side of things:

As much as I always could	Not quite so much now	Definitely not so much now	Not at all

5. Worrying thoughts go through my mind:

A great deal of the time	A lot of the time	From time to time but not too often	Only occasionally

6. I feel cheerful:

Not at all	Not often	Sometimes	Most of the time

7. I can sit at ease and feel relaxed:

Definitely	Usually	Not often	Not at all

8. I feel as if I am slowed down:

Nearly all the time	Very often	Sometimes	Not at all

9. I get a sort of frightened feeling like butterflies in the stomach:

Not at all	Occasionally	Quite often	Very often

10. I have lost interest in my appearance:

Definitely	I don't take as much care as I should	I may not take quite as much care	I take just as much care as ever

11. I feel restless, as if I have to be on the move:

Very much indeed	Quite a lot	Not very much	Not at all

12. I look forward with enjoyment to things:

As much as I ever did	Rather less than I used to	Definitely less than I used to	Hardly at all

13. I get sudden feelings of panic:

Very often indeed	Quite often	Not very often	Not at all

14. I can enjoy a good book or radio or TV programme:

Often	Sometimes	Not often	Very seldom

Appendix B

The Trinity Amputation and Prosthesis Experiences Scales (TAPES) (Gallagher & MacLachlan, 2000).

Part I

Below are written a series of statements concerning the wearing of an artificial limb. Please read through each statement carefully. Then **tick the circle** beside each statement, which shows how strongly you agree or disagree with it.

Strongly Disagree
Disagree
Neither Agree nor Disagree
Agree
Strongly Agree

1. I have adjusted to having an artificial limb [1] [2] [3] [4] [5]
2. As time goes by, I accept my artificial limb more [1] [2] [3] [4] [5]
3. I feel that I have dealt successfully with this trauma in my life [1] [2] [3] [4] [5]
4. Although I have an artificial limb, my life is full [1] [2] [3] [4] [5]
5. I have gotten used to wearing an artificial limb [1] [2] [3] [4] [5]
6. I don't care if somebody looks at my artificial limb [1] [2] [3] [4] [5]
7. I find it easy to talk about my artificial limb [1] [2] [3] [4] [5]
8. I don't mind people asking about my artificial limb [1] [2] [3] [4] [5]
9. I have difficulty in talking about my limb loss in conversation [5] [4] [3] [2] [1]
10. I don't care if somebody notices that I am limping [1] [2] [3] [4] [5]
11. An artificial limb interferes with the ability to do my work [5] [4] [3] [2] [1]
12. Having an artificial limb makes me more dependent on others than I would like to be [5] [4] [3] [2] [1]
13. Having an artificial limb limits the kind of work that I can do [5] [4] [3] [2] [1]
14. Being an amputee means that I can't do what I want to do [5] [4] [3] [2] [1]
15. Having an artificial limb limits the amount of work that I can do . . . [5] [4] [3] [2] [1]

The following questions are about activities you might do during a typical day. Does having an artificial limb limit you in these activities? If so, how much? *Please tick the appropriate box.*

	Yes, limited a lot	limited a little	No, not limited at all
(a) Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports..... [2]		[1]	[0]
(b) climbing several flights of stairs..... [2]		[1]	[0]
(c) running for a bus..... [2]		[1]	[0]
(d) sport and recreation..... [2]		[1]	[0]
(e) climbing one flight of stairs..... [2]		[1]	[0]
(f) walking more than a mile..... [2]		[1]	[0]
(g) walking half a mile..... [2]		[1]	[0]
(h) walking 100 yards..... [2]		[1]	[0]
(i) maintaining friendships [2]		[1]	[0]
(j) visiting friends..... [2]		[1]	[0]
(k) working on hobbies..... [2]		[1]	[0]
(l) going to work..... [2]		[1]	[0]

Please tick the box that represents the extent to which you are satisfied or dissatisfied with each of the different aspects of your artificial limb mentioned below:

	<i>Very Dissatisfied</i>	<i>Dissatisfied</i>	<i>Neither Dissatisfied nor Satisfied</i>	<i>Satisfied</i>	<i>Very Satisfied</i>
(i) Colour.....	[1]	[2]	[3]	[4]	[5]
.....					
(ii) Shape	[1]	[2]	[3]	[4]	[5]
.....					
(iii) Noise	[1]	[2]	[3]	[4]	[5]
.....					
(iv) Appearance	[1]	[2]	[3]	[4]	[5]
.....					
(v) Weight	[1]	[2]	[3]	[4]	[5]
.....					
(vi) Usefulness	[1]	[2]	[3]	[4]	[5]
.....					
(vii) Reliability	[1]	[2]	[3]	[4]	[5]
.....					
(viii)Fit	[1]	[2]	[3]	[4]	[5]
.....					
(ix) Comfort	[1]	[2]	[3]	[4]	[5]
.....					
(x) Overall Satisfaction	[1]	[2]	[3]	[4]	[5]
.....					

Part II

(For the following questions, please tick the appropriate boxes)

1. On average, how many hours a day do you wear your prosthesis? _____ hours

2. In general, would you say your health is:

Very Poor [1] Poor [2] Fair [3] Good [4] Very Good [5]

3. In general, would you say your physical capabilities are:

Very Poor [1] Poor [2] Fair [3] Good [4] Very Good [5]

4(a) Do you experience residual limb (stump) pain (pain in the remaining part of your amputated limb)?

No [0] (If no, go to question 5)

Yes [1] (If yes, answer part (b), (c), (d) and (e))

(b) During the last week, how many times have you experienced stump pain? _____

(c) How long, on average, did each episode of pain last? _____

(d) Please indicate, the average level of stump pain experienced during the last week on the scale below by ticking the appropriate box:

Excruciating	Horrible	Distressing	Discomforting	Mild
[5]	[4]	[3]	[2]	[1]

(e) How much did stump pain interfere with your normal lifestyle (eg. work, social and family activities) during the last week?

A Lot	Quite a Bit	Moderately	A Little Bit	Not at All
[5]	[4]	[3]	[2]	[1]

5. (a) Do you experience phantom limb pain (pain in the part of the limb which was amputated)?

No [0] (if no, go to question 6)

Yes [1] (If yes, answer part (b), (c), (d), and (e))

(b) During the last week, how many times have you experienced phantom limb pain? _____

(c) How long, on average, did each episode of pain last? _____

(d) Please indicate the average level of phantom limb pain experienced during the last week on the scale below by ticking the appropriate box:

Excruciating	Horrible	Distressing	Discomforting	Mild
[5]	[4]	[3]	[2]	[1]

(e) How much did phantom limb pain interfere with your normal lifestyle (eg. work, social and family activities) during the last week?

A Lot	Quite a Bit	Moderately	A Little Bit	Not at All
[5]	[4]	[3]	[2]	[1]

6. (a) Do you experience any other medical problems apart from stump pain or phantom limb pain? No [0]

Yes [1] (If yes, answer part (b), (c), (d), (e), (f) and (g))

(b) Please specify what problems you experience _____

(c) During the last week, how many times have you suffered from these medical problems? _____

(d) How long, on average, did each problem last? _____

(e) Please indicate the level of pain experienced as a result of these problems during the last week on the scale below by ticking the appropriate box:

Excruciating	Horrible	Distressing	Discomforting	Mild
[5]	[4]	[3]	[2]	[1]

(f) How much did these medical problems interfere with your normal lifestyle (e.g. work, social and family activities) during the last week?

A Lot	Quite a Bit	Moderately	A Little Bit	Not at All
[5]	[4]	[3]	[2]	[1]

(g) Do you experience any other pain that you have not previously mentioned?

No [0]

Yes [1]

If yes, please specify _____

**Please check that you have answered all the questions.
Thank you for all your help.**

Appendix C

Additional questions attached to the TAPES

1. When did you have your amputation?
2. What is your ethnic group?
3. To what extent do you feel responsible for having needed an amputation?

1	2	3	4	5
Wholly responsible	Very responsible	Quite responsible	Slightly responsible	Not at all responsible

Appendix D

The Self Consciousness Scale (SCS)
(Fenigstein, Scheier & Buss, 1975)

	Extremely uncharacteristic (not at all like me)	Uncharacteristic (somewhat unlike me)	Neither characteristic nor uncharacteristic	Characteristic (somewhat like me)	Extremely characteristic (very much like me)
I'm always trying to figure myself out.					
I'm concerned about my style of doing things.					
Generally, I'm not very aware of myself.					
It takes me time to overcome my shyness in new situations.					
I reflect about myself a lot.					
I'm concerned about the way I present myself.					
I'm often the subject of my own fantasies.					
I have trouble working when someone is watching me.					
I never scrutinise myself.					
I get embarrassed very easily.					
I'm self- conscious about the way I look.					
I don't find it hard to talk to strangers.					
I'm generally attentive to my inner feelings.					

	Extremely uncharacteristic (not at all like me)	Uncharacteristic (somewhat unlike me)	Neither characteristic nor uncharacteristic	Characteristic (somewhat like me)	Extremely characteristic (very much like me)
I usually worry about making a good impression.					
I'm constantly examining my motives.					
I feel anxious when I speak in front of a group.					
One of the last things I do before I leave my house is look in the mirror.					
I sometimes have the feeling that I'm off somewhere watching myself.					
I'm concerned about what other people think of me.					
I'm alert to changes in my mood.					
I'm usually aware of my appearance.					
I'm aware of the way my mind works when I work through a problem.					
Large groups make me feel nervous					

Appendix E

The Appearance Schemas Inventory (ASI) (Cash & Labarge, 1996)

	Strongly Disagree	Mostly Disagree	Neither Disagree Nor Agree	Mostly Agree	Strongly Agree
What I look like is an important part of who I am.					
What's wrong with my appearance is one of the first things that people will notice about me.					
One's outward physical appearance is a sign of the character of the inner person.					
If I could look just as I wish, my life would be much happier.					
If people knew how I <i>really</i> look, they would like me less.					
By controlling my appearance I can control many of the social and emotional events in my life					
My appearance is responsible for much of what has happened to me in my life.					
I should do whatever I can to always look my best.					
Ageing will make me less attractive.					
For women: To be feminine, a woman must be as pretty as possible. For men: To be masculine, a man must be as handsome as possible.					

	Strongly Disagree	Mostly Disagree	Neither Disagree Nor Agree	Mostly Agree	Strongly Agree
The media's messages in our society make it impossible for me to be satisfied with my appearance.					
The only way I could ever like my looks would be to change what I look like.					
Attractive people have it all.					
Homely people have a hard time finding happiness.					

Appendix F

Initial information sent to patients at Leicester Disablement Services Centre

Leicester General Hospital
Gwendolen Road
Leicester
LE5 4PW

Date:

Tel: 0116 2490490

To:

Fax: 0116 2584666

Minicom: 0116 2588188

Dear

Re: Project investigating psychological adjustment to lower limb amputation

A research study is being carried out at the Leicester General Hospital by Rachel Atherton, Trainee Clinical Psychologist.

The study has been designed to investigate factors that influence psychological adjustment to lower limb amputation. Patients are being asked to meet with Rachel to answer questions about their experiences relating to having an amputation and having a prosthesis.

It is hoped that the results of this study will help to improve rehabilitation services for people who have an amputation in the future.

If you would like to take part in this study, details of which are given on the information leaflet enclosed, please complete the reply slip enclosed with this letter and return it in the pre-paid envelope. Rachel will then contact you to arrange a convenient time to obtain your consent and meet you to fill in several questionnaires, which should last no more than one hour in total.

I would like to thank you for taking time to read this letter and hope to hear from you soon. If you have any queries, please feel free to contact me, on the telephone number above.

Yours sincerely

Dr Peter Critchley,
Consultant in Rehabilitation Medicine and Neurology

Disablement Services Centre

Direct Line: 0116 258 4589

Fax: 0116 258 4687

Leicester General Hospital

Gwendolen Road

Leicester

LE5 4PW

Tel: 0116 2490490

Fax: 0116 2584666

Minicom: 0116 2588188

Psychological adjustment to lower limb amputation

Version No 1 - 1.4.2001

Principle Investigator

Rachel Atherton

Trainee Clinical Psychologist

If you have any questions relating to this project, please contact Rachel at the

Department of Medical Psychology

Leicester General Hospital

Gwendolen Rd

Leicester

LE5 4PW

Tel 0116 258 4958

You are being invited to take part in a research study. Before you decide whether to take part it is important that you know why the research is being done and what it will involve.

1. What is the purpose of the study?

Research has shown that many people find it difficult to come to terms with having an amputation. This study aims to explore what factors are important in accepting and coping with an amputation. Identifying what helps people to adjust well will be important in designing rehabilitation programs for other people undergoing amputation. In addition, the study will help predict which people are most likely to experience problems coming to terms with their amputation. This means that in the future we may be able to help these individuals at an earlier stage in their rehabilitation.

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

If you decide to take part in the study you will be asked to meet with Rachel to complete several questionnaires. These questionnaires will ask about your psychological well-being and your experience of having an amputation and using a prosthesis. A private room will be available for this meeting. The session will be arranged at a time that is convenient for you, usually when you attend the Leicestershire Disablement Services centre for an outpatient's appointment. You will only need to meet with Rachel on one occasion and the duration of the meeting is unlikely to be more than one hour. The meeting will not involve any physical examination nor will any medication be involved. It is not anticipated that involvement in this study will result in any distress, but in the unlikely event of this being the case

you will be given information about appropriate support services and you may request a referral to these agencies.

If you agree to take part in the study, you will be asked to sign a consent form. This form will also be signed by Rachel and your doctor. You can then keep a copy of the signed consent form. You may also keep this information leaflet.

3. Will information obtained in the study be confidential?

A copy of the consent form that you sign to indicate you are willing to take part in the study will be filed in your medical notes. However the results of the questionnaires will not go in your medical notes. Confidentiality and anonymity will be ensured according to normal clinical practice. All data gathered during the project will be coded so that you cannot be identified from any documents relating to the project. Furthermore, data that will be held on computer will only be identifiable by code and will be password protected.

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.

5. What happens if I do not wish to participate in this study or wish to withdraw from the study?

If you do not wish to participate in this study or if you wish to withdraw from the study at any time you may do so without justifying your decision and your future treatment will not be affected.

Study title: Psychological adjustment to lower limb amputation

Please return in the enclosed pre-paid envelope to:

Rachel Atherton
Trainee Clinical Psychologist,
Medical Psychology,
Hadley House,
Leicester General Hospital
Gwendolen Rd
Leicester
LE5 4PW

Thank you

- I am interested in taking part in the above study and agree to Rachel Atherton, Trainee Clinical Psychologist contacting me.
- I understand that I am under no obligation to take part in the study

Name:

Address:

.....

.....

Telephone No:

Date:

Appendix G

Initial information sent to patients at Nottingham City Hospital Mobility Centre.

Nottingham City Hospital Mobility Centre
City Hospital
Hucknall Rd
Nottingham
NG5 1PJ
Tel 0115 962 8044
Fax 0115 962 8052

Dear

Re: Project investigating psychological adjustment to lower limb amputation

A research study is being carried out at the Nottingham Hospital Mobility Centre by Rachel Atherton, Trainee Clinical Psychologist.

The study has been designed to investigate factors that influence psychological adjustment to lower limb amputation. Clients are being asked to meet with Rachel to answer questions about their experiences relating to having an amputation and having an artificial limb.

It is hoped that the results of this study will help to improve rehabilitation services for people who have an amputation in the future.

If you would like to take part in this study, details of which are given on the information leaflet enclosed, please complete the reply slip enclosed with this letter and return it in the pre-paid envelope. Rachel will then contact you to arrange a convenient time to meet with you to complete several questionnaires. This appointment should last no more than one hour in total.

I would like to thank you for taking time to read this letter and hope to hear from you soon. If you have any queries, please do not hesitate to contact me, on the telephone number above.

Yours sincerely

Dr A Sutherland,
Consultant in Rehabilitation

Nottingham City Hospital Mobility Centre
City Hospital, Hucknall Rd, Nottingham, NG5 1PJ
Tel 0115 962 8044, Fax 0115 962 8052

Patient Information Leaflet
Version No. 1 – 16.5.2001

Title of Project: Psychological adjustment to lower limb
amputation

A research study is being carried out at the Nottingham City Hospital Mobility Centre by Rachel Atherton, Trainee Clinical Psychologist. You are being invited to take part in this 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 others if you wish. Take time to decide whether or not you wish to take part.

Thank you for reading this.

1. What is the purpose of the study?

Research has shown that many people who have an amputation experience psychological adjustment problems such as anxiety and depression. This study aims to explore what factors are important in adjustment. Identifying what helps people to adjust well will be important in designing rehabilitation programs for other people undergoing amputation. In addition, the study will help predict which people are most likely to experience adjustment problems and so in the future we will be able to help these individuals at an earlier stage in their rehabilitation.

2 Why have I been chosen?

In this study we are particularly interested in how adults adjust to having a lower limb amputation and an artificial limb. The study will be carried out between July 2001 and March 2002. Patients who attend the Nottingham City Hospital Mobility Centre during this time and who meet this description are being asked if they would like to take part. In total 78 patients with a lower limb amputation will take part in the study. The study is taking place at both Nottingham City Hospital Mobility Centre and Leicestershire Disablement Services Centre.

3. Do I have to take part?

It is up to you to decide whether or not to take part. If you do decide to take part you will be given this information leaflet to keep. You will also be asked to sign a consent form and you will receive a copy of the consent form.

If you decide to take part you are still free to withdraw at any time and without giving a reason. A decision to withdraw at any time, or a decision not to take part, will not affect the standard of care you receive.

4. What will happen to me if I take part?

Once you have agreed to take part and have signed the consent form, Rachel will contact you to arrange a time to meet. The session will be arranged at a time that is convenient for you, usually when you attend the Mobility Centre for an outpatient's appointment. When you meet with Rachel you will be asked to answer questions about your psychological well-being and your experience of amputation and having an artificial limb. A private room will be provided for this meeting. You will only need to meet with Rachel on one occasion and the duration of the meeting will not be more than one hour. The meeting will not involve any physical examination nor will any medication be involved. If it is identified that you could benefit from further support, you will be given information about how to access appropriate support services and you may request a referral.

5. What are the possible benefits of taking part?

It is anticipated that this study will help to improve rehabilitation services for people who have an amputation in the future.

6. What if I am harmed by the study?

It is not anticipated that taking part in this study will result in any harm. However it is important to be aware that if you are harmed by taking part in this research project, there are no special compensation arrangements. If you are harmed due to someone's negligence, then you may have grounds for a legal action but you may have to pay for it. Regardless of this, if you wish to complain about any aspect of the way you have been approached or treated during the course of this study, the normal National Health Service complaints mechanisms should be available to you.

7. Will information obtained in the study be confidential?

A copy of the consent form that you sign to indicate that you are willing to take part in the study will be filed in your medical notes. However the results of the questionnaires you complete with Rachel will not go in your medical notes. All information which is collected about you during the course of the research will be kept strictly confidential. Any information about you which leaves the hospital will have your name and address removed so that you cannot be recognized from any documents relating to the project.

8. What will happen to the results of the research study?

The study will be written up as part of the lead investigator's Doctorate in Clinical Psychology and will be submitted to the University of Leicester. The write up will also be submitted to a professional journal. It is important to emphasise that no-one will be able to be identified in any report or publication

9. Who is organising and funding the research?

The funding is provided by the lead investigator's employer which is Leicestershire and Rutland NHS Trust.

10. Contact for further information

The lead investigator for this project is Rachel Atherton, Trainee Clinical Psychologist. If there is anything that is not clear or if you would like more information, please contact

Rachel at the **Department of Medical Psychology**

Leicester General Hospital

Gwendolen Rd

Leicester

LE5 4PW

Tel 0116 258 4958

Thank-you once again for taking the time to read this information.

Study title: Psychological adjustment to lower limb amputation

Please return in the enclosed pre-paid envelope to:

Rachel Atherton
Trainee Clinical Psychologist,
Medical Psychology,
Hadley House,
Leicester General Hospital
Gwendolen Rd
Leicester
LE5 4PW

Thank you

- I am interested in taking part in the above study and agree to Rachel Atherton, Trainee Clinical Psychologist contacting me.
- I understand that I am under no obligation to take part in the study

Name:

Address:

.....

.....

Telephone No:

Date:

Appendix H

Example of a consent form for participants from Leicester Disablement Services
Centre

Disablement Services Centre

Direct Line: 0116 258 4589

Fax: 0116 258 4687

Leicester General Hospital

Gwendolen Road

Leicester

LE5 4PW

PATIENT CONSENT FORM

Tel: 0116 2490490

Fax: 0116 2584666

Minicom: 0116 2588188

Psychological adjustment to lower limb amputation

Principle Investigator Rachel Atherton, Trainee Clinical Psychologist

This form should be read in conjunction with the Patient Information Leaflet, version no 1 dated 1.4.2001.

I agree to take part in the above study as described in the Patient 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 collected in this study 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 patient information leaflet on the above study and have had the opportunity to discuss the details with Rachel Atherton, Trainee Clinical Psychologist and ask any questions. The nature and the purpose of the tests to be undertaken have been explained to me and I understand what will be required if I take part in the study.

Signature of patient

Date.....

(Name in BLOCK LETTERS)

.....

Signature of clinician responsible for patient care

..... Date.....

(Name in BLOCK LETTERS)

.....

I confirm I have explained the nature of the Trial, as detailed in the Patient Information Sheet, in terms which in my judgement are suited to the understanding of the patient.

Signature of Investigator

Date.....

(Name in BLOCK LETTERS)

.....

1 copy for participant; 1 copy for researcher; 1 copy to be kept with hospital notes.

Appendix I

Example of a consent form for participants from Nottingham City Hospital
Mobility Centre.

PATIENT CONSENT FORM**Title of project:** Psychological adjustment to lower limb amputation**Site:** Nottingham City Hospital Mobility Centre, Nottingham City Hospital.**Investigators**

1. **Lead Investigator: Ms. Rachel Atherton, Trainee Clinical Psychologist, Department of Medical Psychology, Leicester General Hospital.**
2. Dr Antoinette Sutherland, Consultant in Rehabilitation Medicine, Nottingham City Hospital Mobility Centre.
3. Dr Peter Critchley, Consultant in Neurology and Rehabilitation Medicine, Leicestershire Disablement Services Centre.
4. Dr Nirmala Devi, Associate Specialist in Rehabilitation Medicine, Leicestershire Disablement Services Centre.
5. Ms. Noelle Robertson, Consultant Clinical Psychologist, Department of Medical Psychology, Leicester General Hospital.
6. Dr Marilyn Christie, Senior Lecturer in Clinical Psychology, Centre for Applied Psychology, Clinical Section, Ken Edwards Building, University of Leicester.

The patient should complete the whole of this sheet himself/herself.

Please cross out as necessary

- Have you read & understood the patient information sheet YES/NO
- Have you had opportunity to ask questions & discuss the study YES/NO
- Have all the questions been answered satisfactorily YES/NO
- Have you received enough information about the study YES/NO
- Who have you spoken to? Dr/Mrs/Ms
- Do you understand that you are free to withdraw from the study
 - at any time YES/NO
 - without having to give a reason YES/NO
 - without affecting your future medical care YES/NO
- Do you agree to take part in the study YES/NO

Signature (Patient)..... Date.....

Name (In block capitals).....

I have explained the study to the above patient and he/she has indicated his/her willingness to take part.

Signature (Investigator)..... Date.....

Name (In block capitals).....



Appendix J

Ethical approval for carrying out the study at Leicester Disablement Services
Centre

Leicester General Hospital

DIRECTORATE OF RESEARCH & DEVELOPMENT Gwendolen Road

Director: Professor J Feehally

Leicester

Business Manager: Dr N J Seare

LE5 4PW

Co-ordinators: Glennis Jarvis & Aimee Geary

Direct Dial: (0116) 2584109

Tel: 0116 2490490

Fax No: (0116) 2584226

Fax: 0116 2584666

Minicom: 0116 2588188

Ms Rachel Atherton
9 Grange Avenue
Breaston
Derby
DE72 3BX

5 July 2001

Dear Ms Atherton

RE: Project Number: 7008 *[Please quote this number in all correspondence]*
Psychological adjustment to lower limb amputation

Thank you for your letter received on the 5 July 2001 in response to the Committee's comments regarding the proposed recruitment methods in their approval letter dated 9 May 2001

Since all other aspects of your UHL R+D notification are complete, I now have pleasure in confirming full approval of the project on behalf of the University Hospitals of Leicester NHS Trust, Leicester General Hospital.

This approval means that you are fully authorised to proceed with the project, using all the resources which you have declared in your notification form.


The project is also now covered by Trust Indemnity, except for those aspects already covered by external indemnity (e.g. ABPI in the case of most drug studies).

We will be requesting annual and final reports on the progress of this project, both on behalf of the Trust and on behalf of the Ethical Committee.

In the meantime, in order to keep our records up to date, could you please notify the Research Office if there are any significant changes to the start or end dates, protocol, funding or costs of the project.

I look forward to the opportunity of reading the published results of your study in due course.

Yours sincerely



Dr N J Seare
Research & Development Business Manager

Appendix K

Ethical approval for carrying out the study at Nottingham City Hospital Mobility Centre.

Please ask for: Dr Derek Pearson

Ref: EC01/65

20 December 2001

Ms R Atherton
26A Station Road
Draycott
Derbyshire
DE72 3QB

Research Ethics Committee
Hucknall Road
Nottingham
NG5 1PB

Tel: 0115 969 1169 ext 45860
Fax: 0115 9627784
e-mail: dpearson@ncht.trent.nhs.uk
Minicom: 0115 962 7749
www.ncht.org.uk

Dear Ms Atherton

Re: Psychological adjustment to lower limb amputation. Ref: EC01/65

Thank you for your letter dated 11 December 2001 enclosing a revised copy of the GP letter and for answering the queries raised by the committee. I note that your supervisor is now Dr Marilyn Christie.

I can now give this study officer approval and this will be reported to the full committee at the next meeting to be held on 28 January 2002.

Approval is given on the following understanding:

- Approval is granted for 3 years from the date of this letter. If you fail to start the research within this time you will have to re-apply for further approval.
- It is the responsibility of the investigator to notify the committee immediately of any information received by him/her or of which he/she becomes available, which would cast doubt upon or alter any information contained in the original application or a later amendment application, which would raise questions about the safety and/or continued conduct of the research.
- Patient information stored on computer must be handled in accordance with the Data Protection Act 1998 and local policies and procedures relating to the use of computer held data.
- All research must be conducted throughout according to good clinical research practice standards.
- All serious or unexpected adverse events and adverse drug reactions which may affect the conduct and the continuation of the study must be reviewed by the lead researcher and reported to the committee. Please use the attached pro-forma when submitting adverse event reports.

- All protocol amendments must be referred to the committee for further review and approved prior to implementation except where the welfare of the subject is paramount.
- All research which is discontinued temporarily or permanently should be reported to the committee.
- The committee requests the researcher to provide details of the progress of the research at least annually and details of its conclusion and outcome.
- If you intend to undertake this research at Queen's Medical Centre (QMC) as well approval must be sought from the QMC Research Ethics Committee by submitting one copy of the documentation and a copy of this approval letter to the Honorary Secretary of the QMC Research Ethics Committee.
- The meeting of the committee which considered your application was quorate according to the constitution of the committee.
- The membership of the committee is attached. It is against the policy of the committee to identify which members were present when your submission was approved.

Yours sincerely



Dr D Pearson
Honorary Secretary
City Hospital Research Ethics Committee

Appendix L

Summary of which the data met parametric assumptions

Appendix L

Summary of which data met parametric assumptions

Measure	Category	Variable	Scale	Clark-Carter rule met?	Normality			Can use Parametric tests?
					KS Statistic	Sig.	Normal?	
TAPES	Patient information	Sex	N					N
		Age	R		.063	.200	Y	Y
		Ethnic group	N					N
	Amputation factors	Reason for amputation	N					N
		Type of amputation	N					N
		Time since amputation	R		.084	.200	Y	Y
		Hrs/day wear prosthesis	R		.224	.000	N	N
		Perceived responsibility for amputation	O	N				N
	General Health	Perceived health	O	N				N
		Perceived physical ability	O	N				N
	Residual Limb Pain	Number of episodes	R		.292	.000	N	N
		Average duration	R		.457	.000	N	N
		Intensity of pain	O	N				N
		Interference with life	O	N				N
	Phantom Limb Pain	Number of episodes	R		.284	.000	N	N
		Average duration	R		.395	.000	N	N
		Intensity of pain	O	N				N
		Interference with life	O	N				N
	Other medical conditions	Presence	N					N
		Intensity of pain	O	N				N
		Interference with life	O	N				N
	Psychosocial adjustment	General adjustment	O	Y	.124	.012	N	N
		Social adjustment	O	Y	.152	.001	N	N
		Adjustment to limitation	O	Y	.164	.000	N	N

		Total	O	Y	.078	.200	Y	Y
	Restriction	Athletic	O	N				N
		Functional	O	N				N
		Social	O	N				N
		Total	O	Y	.161	.000	N	N
	Satisfaction with prosthesis	Aesthetic	O	N				N
		Weight	O	N				N
		Functional	O	Y	.194	.000	N	N
		Total	O	Y	.092	.200	Y	Y
HADS		Depression	O	Y	.156	.000	N	N
		Anxiety	O	Y	.127	.009	N	N
SCS		Private	O	Y	.141	.002	N	N
		Public	O	Y	.092	.200	Y	Y
		Social Anxiety	O	Y	.142	.002	N	N
ASI		Body image vulnerability	O	Y	.078	.200	Y	Y
		Self-investment	O	Y	.074	.200	Y	Y
		Appearance stereotype	O	N				N
		Total	O	Y	.069	.200	Y	Y

Notes

Clark Carter (1997) states that “*if the variable is ordinal but has sufficient levels- say 20 or more- then as long as the other parametric requirements are fulfilled, it is considered legitimate to conduct parametric tests on the data.*” P 204.

K-S Statistic is the Kolmogorov-Smirnov Test.