Coping strategies as predictors of psychosocial adaptation in a sample of elderly veterans with acquired lower limb amputations

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Abstract

This study examines the contribution of demographic/amputation-related variables and coping strategies to the prediction of psychosocial adaptation in veterans with acquired lower limb amputations. Multiple indicators of the psychosocial adjustment of 796 individuals in the UK aged between 26–92 years with lower limb amputations were assessed. Hierarchical linear regressions were performed to investigate relationships between demographic/amputation-related variables (i.e. age, time since amputation, amputation level and amputation aetiology), the dimensions of coping (namely problem solving, seeking social support and avoidance) and self-reported adaptation to amputation, as well as symptoms of intrusion, anxiety and depression. Results indicated that coping styles were important predictors of psychosocial adaptation. Avoidance was strongly associated with psychological distress and poor adjustment. In contrast, problem solving was negatively associated with depressive and anxious symptomatology whereas seeking social support was negatively associated with symptoms of depression and positively associated with social adaptation. These findings suggest the potential for interventions designed to promote particular coping strategies to improve psychosocial outcomes.
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Introduction

The amputation of a limb confronts the individual with a multitude of evolving physical and psychosocial challenges such as impairments in physical functioning, prosthesis use, pain, changes in employment status or occupation, and alterations in body image and self-concept. Such stressors challenge the individuals' ability to maintain emotional well-being and may engender maladaptive reactions leading to poor psychosocial adjustment. However, there is considerable variation in the psychosocial functioning of individuals with amputations. Many individuals function well, but a notable subgroup experience clinically significant psychological or social problems (Cansever, 2003; Dougherty, 2001; Hagberg & Branemark, 2001; Kashani, Frank, Kashani, Wonderlich, & Reid, 1983; Pezzin, Dillingham, & MacKenzie, 2000; Rybarczyk, Nyenhuis, Nicholas, Cash, & Kaiser, 1995).

Numerous factors contribute to variation in psychosocial adaptation to disability (Livneh, 2001; Schultz

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et al., 2004). A critical mediating role in psychosocial adjustment is ascribed to the coping strategies or styles individuals adopt to manage experiences associated with illness or injury (Endler, Corace, Summerfeldt, Johnson, & Rothbart, 2003; Livneh, Antonak, & Gerhardt, 1999, 2000; Mikulinecer & Florian, 1996). Therefore, the potential to promote favourable coping strategies represents a key pathway towards prevention of adjustment problems. Nonetheless, there is as yet no clear consensus with regard to which coping strategies or modes of coping are most effective in resolving difficulties, alleviating emotional distress and mitigating future problems (Karlsen & Bru, 2002). It is suggested, however, that in the long term, emotion-oriented and avoidant coping styles may be less adaptive than problem/task oriented and approach strategies (Lazarus & Folkman, 1984), although the impact of these strategies is mediated by the specific constraints imposed by the stressful situation (de Ridder & Schreurs, 2001).

Research specifically addressing the role of coping strategies in post-amputation adjustment, consistent with the wider coping literature, suggests that active/task-oriented strategies such as problem solving and perceiving control over the disability are conducive to positive psychosocial adjustment (e.g. Dunn, 1996; Livneh et al., 1999) whereas emotion-focussed and passive strategies such as cognitive disengagement, catastrophizing and wishful thinking have been associated with poor psychosocial outcomes (Hill, Niven, & Knussen, 1995; Livneh et al., 1999). For example, Livneh et al. (1999) found that greater active problem solving was negatively associated with depression and internalised anger and positively associated with adjustment and acceptance of disability. In contrast, emotion focussed coping and cognitive disengagement were positively associated with depression, externalised hostility and lack of acceptance of disability.

However, literature pertaining to associations between coping and psychosocial adjustment to amputation, as a unique condition, is relatively scarce and several methodological issues limit the conclusions drawn and generalisability of these investigations. First, extant studies have used reasonably small sample sizes (e.g. Gallagher & MacLachlan, 1999; Livneh et al., 1999; Sjödahl, Gard, & Jarnlo, 2004). Second, much available research is premised exclusively on coping with phantom limb pain (e.g. Hanley et al., 2004; Hill et al., 1995; Jensen et al., 2002; Whyte & Carroll, 2004). Although phantom limb pain, i.e. painful sensation in the missing portion of an amputated limb, is a very common sequalae of amputation, most individuals with amputations experience infrequent, episodic phantom pain, which is not perceived to be significantly disabling or bothersome (Ehde et al., 2000; Gallagher, Allen, & MacLachlan, 2001). Nevertheless, only a small amount of research attention has been directed to coping with other facets of the amputation experience. Third, assessments have largely been conducted using generic measures of coping formulated through factor analysis with general population samples. There is little or no evidence detailing their psychometric properties with individuals with amputations. Indeed, a major weakness of many coping measures centres on their unstable factor structures and lack of cross validation (Parker, Endler, & Bagby, 1993; Schwarzer & Schwarzer, 1996).

The purpose of this study is therefore to examine the contribution of coping strategies to the prediction of psychosocial adjustment of a relatively large sample of individuals with acquired lower limb amputations using an assessment of coping the structural integrity of which has been verified for this sample. Furthermore, the assessment of coping was not restricted to the issue of phantom pain, rather respondents were asked to think of a problem relating to their amputation during the past 6 months, thus giving primacy to the issues personally relevant to the respondents.

Method

Participants

Eligible members of the British Limbless Ex-Service Men's Association (BLESMA), a British national charity dedicated to promotion of the welfare of those who have lost a limb or limbs, one or both eyes, or the use of a limb in any branch of Her Majesty's Forces or Auxiliary Forces were invited to participate in a research project concerning psychosocial adjustment to physical injury. Of the questionnaires distributed ($n = 2500$), 22 were returned because the intended recipient was deceased. A total of 1222 questionnaires were returned representing a response rate of 49%, of which 1072 contained sufficient data for analysis. Data were collected for 952 individuals with limb amputation(s); 52 individuals who had lost an eye; 5 people who had lost their sight; 47 individuals had lost the use of a limb(s); 1 person who had lost both an eye and the use of a limb; 6 people who had lost their hearing; and 9 people with other injuries including facial disfigurement and head injuries. The inclusion criterion for the current investigation was acquired lower limb amputation. This group ($n = 796$) included 765 males and the mean age was 74 years (SD = 12.18; range 26–92; median 78 years). The average time elapsed since amputation was 42.6 years (SD 21.35; range 2 months to 66.6 years; median 56 years). Most amputations were attributed to traumatic injury (82.8%) and were at the below-knee level (53.6%).

Procedure

Data were gathered using self-report postal questionnaires. BLESMA published an article outlining the aims of the study in their quarterly magazine, the BLESMAG. Questionnaire packs including cover letters, a copy of the questionnaire and a stamped addressed reply envelope were subsequently distributed by post to eligible members. A reminder to return completed questionnaires to BLESMA head office in Essex, was published in the BLESMAG approximately 6 weeks after initial questionnaire distribution. Personalised reminders were not issued to nonresponders due to financial constraints and respondents were not offered incentives for participation. The Ethics Committee of the authors' institution approved the study protocol.

Materials

Predictor variables

Coping strategies were assessed using the Coping Strategy Indicator (Amirkhan, 1990). This 33-item self-report questionnaire measures the use of 3 coping strategies, namely problem solving, seeking social support, and avoidance, in response to a specific stressor. Responses are indicated by means of a three-point scale: a lot (3), a little (2), or not at all (1). The 3 subscales each contain 11 items and subscale scores are calculated by summing responses to appropriate items (range 0–33), higher scores indicate greater use of the strategy. Cronbach's alpha coefficients indicate adequate internal consistency for each of the subscales ranging from 0.86 to 0.98 for problem solving, 0.89–0.98 for seeking social support and from 0.77 to 0.96 for avoidance (Amirkhan, 1990; Bijttebier & Vertommen, 1997; Clark, Bormann, Cropanzano, & James, 1995; Utsey, Ponterotto, Reynolds, & Cancelli, 2000). Confirmatory factor analysis of the scales structure (Desmond & MacLachlan, under review) indicated that a trifactorial structure corresponding to the original CSI (Amirkhan, 1990) subscales of problem solving, avoidance and seeking social support provided adequate fit. The remarkable coherence of the subscales is notable in light of difficulties in identifying replicable sets of coping dimensions in different populations using other coping scales (e.g. Lyne & Roger, 2000; Parker et al., 1993).

In the original version of the scale respondents are asked to identify a stressful event occurring within the last 6 months and to consider the manner in which they had coped with it. In the current study 'coping with amputation' was specified as the event. Respondents were required to think of a problem encountered in relation to their injury in the past 6 months and reflect on their coping strategies.

Predictor variables also included a set of *demographic and amputation-related variables* (age, time elapsed since amputation, amputation level (i.e. above knee, thorough knee or below knee) and amputation aetiology (i.e. trauma or disease).

Psychosocial adjustment variables

Affective distress

Symptoms of *anxiety* and *depression* were assessed using the Hospital Anxiety and Depression Scale (HADS: Zigmond & Snaith, 1983). The HADS is a 14-item scale designed as a brief screening instrument for both anxiety and depression in nonpsychiatric populations (Herrmann, 1997). Items are answered on a four-point Likert scale (range 0–3). The anxiety and depression subscales each comprise 7 items that are summed to give subscale scores ranging from 0 to 21, with higher scores indicating greater levels of anxiety and depression. Good reliability has been reported for each of the HADS subscales. Cronbach's alpha coefficients for the HADS subscales are .84 for anxiety and .78 for depression.

Symptoms of *intrusion*, a defining feature of post-traumatic psychological distress (B criteria in the DSM-IV PTSD diagnosis: American Psychiatric Association, 1994), were measured using the intrusion subscale of the Impact of Event Scale (Horowitz, Wilner, & Alvarez, 1979). The IES-intrusion dimension is measured by 7 items reflecting symptoms such as waves of strong feelings about the event, intrusive thoughts and memories, and nightmares connected with the traumatic experience. Respondents are required to indicate the frequency of occurrence of symptoms in the past week and items are scored on a 4-point Likert scale. Intrusion subscale scores range from 0 to 35; the higher the score, the greater the level of intrusion experienced. Cronbach's alpha coefficient for this sample was .91 for the intrusion scale.

Adaptation to amputation and prosthesis use

The Trinity Amputation and Prosthesis Experience Scales (TAPES: Gallagher & MacLachlan, 2000) is a multidimensional assessment of adaptation to amputation and prosthesis use developed specifically for use with individuals with lower limb amputations. In the current study the subscales assessing psychosocial adjustment (*general adjustment*, *social adjustment*, *adjustment to limitation*) were utilised.

The g*eneral adjustment* subscale reflects the extent of adjustment to and acceptance of an artificial limb and incorporates items such as "As time goes by, I accept my artificial limb more" and "Although I have an artificial limb, my life is full". S*ocial adjustment* pertains to the influence of the artificial limb in social situations, encompassing ease of talking about the limb and dealing

with others' reactions to it. The *adjustment to limitation* dimension reflects restriction ensuing from having an artificial limb and incorporates items such as "Having an artificial limb makes me more dependent on others than I would like" and "Being an amputee means that I can't do what I want to do". Items on each of these subscales are rated on a 5-point Likert scale. Scores range from 5 to 25, with higher scores indicating more favourable adjustment. Cronbach's alpha coefficients indicate excellent internal reliability for each of the subscales (*general adjustment* .886, *social adjustment* .862, and *adjustment to limitation* .833).

Data analyses

Analyses proceeded in stages. First, intercorrelations among all variables were calculated to identify associations between hypothesised predictors and outcome measures. Prior to conducting the preliminary analyses and hierarchical multiple regression analyses, scores on the time since amputation and age variables were collapsed into four categories each to overcome the high degree of skewness present in the distribution of both variables. Values of the time elapsed since amputation variable originally ranging from 2 months to $66\frac{1}{2}$ years (mean 526.23, SD 245.79) were collapsed into: (a) short duration (bottom fourth; range 2 months to 30 years, $n = 232$), (b) mid-range; range $30-56\frac{1}{2}$ years, $n = 237$), (c) long duration (range $56\frac{1}{2}-58$ years, $n = 269$), and (d) very long duration (range 58 years to $66\frac{1}{2}$ years, $n = 187$). Similarly, participants ages originally ranging from 26 to 92 years (mean 74.31 years, SD 12.06) were collapsed into: (a) younger group (range 26–65 years, $n = 165$), (b) young old-age group (range 66 to 77 years, $n = 252$), old old-age group (range 78–82 years, $n = 354$) and oldest age group (range 83–92 years, $n = 171$).

A series of hierarchical regression equations were used to estimate the role of coping strategies in psychosocial adaptation to amputation. Predictor variables included a set of four disability/demographic related factors (*time elapsed since amputation*, *age*, *amputation aetiology*, *and level of amputation*) and a set of three coping strategies (composite scores from each of the three empirically derived coping factors: a*voidance*, *seeking social support* and *problem solving*). The predictor variables were entered in two blocks. Entered first was the block of demographic/disability-related variables. Entered second was the block comprising the three coping strategies. Psychosocial outcome measures included participants' scores on the HADS subscales, IES-Intrusion subscale and TAPES subscales. The data conformed to the assumptions of the statistical procedures used.

Table 1
Results of regression analyses

Variables outcome measures	R^2	ΔR^2	F	P
Anxiety				
S/D block	.042		7.038	<.001
Coping block	.203	.161	23.461	<.001
Depression				
S/D block	.091		1.400	.232
Coping block	.424	.171	20.765	<.001
Intrusion				
S/D block	.023		3.889	.004
Coping block	.191	.168	45.547	<.001
Adjust. to limit.				
S/D block	.066		10.846	<.001
Coping block	.109	.043	10.726	<.001
General adjustment				
S/D block	.036		6.419	<.001
Coping block	.092	.055	9.796	<.001
Social adjustment				
S/D block	.004		.701	.592
Coping block	.070	.066	7.379	<.001

S/D block = block of four sociodemographic and disability related factors. Coping block = block of three coping strategies.

Results

Intercorrelations among all study variables are available from the authors on request. The coping scales were low to moderately correlated, ranging from $r = .34$ (Avoidance with Seeking Social Support) to $r = .45$ (Seeking Social Support with Problem Solving; p's < .01). Intercorrelations among the criteria measures were also moderate, ranging from $r = .20$ (Intrusion with Physical Restriction) to $r = .62$ (Depression with Anxiety, p's < .01). Table 1 provides a summary of the results obtained from the series of multiple regression analyses predicting the various facets of psychosocial adaptation to amputation.

Anxiety

When anxiety was used as an outcome measure, the block of four disability/demographic variables contributed significantly to the explained variance, $R^2 = .04$, $F_{(4,653)} = 7.04$, $p < .001$. Of the four variables in the block, *time elapsed since amputation* was a significant predictor of anxiety. The more recent the occurrence of amputation (time since amputation $\beta = -.13$, $t = 2.50$, $p = .013$) the more pronounced was the reported experience of anxiety. The addition of the block of three coping strategies in the second step significantly added

to the variance explained, $\Delta R^2 = .16$; $F_{(7,653)} = 23.46$, $p < .001$. Specifically, *avoidance* and *problem solving* made significant contributions to the prediction of anxiety scores. Higher levels of *avoidance* were associated with higher levels of reported anxiety, $\beta = .52$, $t = 10.46$, $p < .001$ and greater use of *problem solving* was associated with lower levels of anxiety symptoms, $\beta = -.14$, $t = 2.98$, $p = .003$. Using published criteria for anxiety on the HADS, 20.1% of respondents scored within the mild range, 12.4% reported moderate levels of anxiety and 5% indicated severe anxiety levels.

Depression

The block of demographic/disability-related variables failed to significantly predict scores on the depression scale, $R^2 = .008$, $F_{(4,627)} = 1.40$, $p = .232$. The addition of the block of coping strategies significantly contributed to the variance explained $\Delta R^2 = .17$; $F_{(7,672)} = 20.77$, $p < .001$. Greater use of *problem solving* ($\beta = -.211$, $t = 24.25$, $p = .003$) and s*ocial support seeking* ($\beta = -.184$, $t = 3.43$, $p = .001$) strategies were associated with lower levels of depressive symptomatology whereas more extensive use of *avoidance* was associated with higher levels of reported depression ($\beta = .589$, $t = 11.50$, $p < .001$). Using the published criteria for depression on the HADS, 19.9% were in the range reflecting 'mild' symptoms of depression, with 10.8% and 2% being in the ranges representing 'moderate' and 'severe' symptoms, respectively.

Intrusion

When predicting IES-Intrusion scores, the block of variables entered in Step 1 successfully explained a significant portion of the variance, $R^2 = .021$, $F_{(4,602)} = 3.188$, $p = .013$. Specifically, longer time elapsed since amputation was associated with lower intrusion scores ($\beta = -.169$, $p = .003$). The addition of the block of coping variables in the second step resulted in a substantial increase in the ability to predict intrusion scores, $\Delta R^2 = .162$; $F_{(7,602)} = 19.023$, $p < .001$. *Avoidance* accounted solely for the increase in predictive efficiency ($\beta = .447$, $t = 8.827$, $p < .001$). Individuals who extensively utilised avoidant coping strategies reported higher levels of intrusion symptoms.

Adjustment to limitation

When predicting Adjustment to Limitation scores, the block of four disability/demographic variables contributed significantly to the variance explained, $R^2 = .058$, $F_{(4,669)} = 10.29$, $p < .001$. Age, level of amputation and time elapsed since amputation showed significant relationships to adjustment to limitation. Younger age, above knee amputation and less time

elapsed since amputation was associated with less favourable levels of adjustment to limitation. Adding the block of three coping scores resulted in a significant increase in predicting level of adjustment to limitation, $\Delta R^2 = .045$; $F_{(7,622)} = 10.85$, $p < .001$. *Avoidance* alone accounted for this increase ($\beta = -.268$, $t = 5.05$, $p < .001$). Individuals who employed more *avoidance* reported lower levels of adjustment to amputation.

General adjustment

When scores on the general adjustment scale were predicted from the initial block of three demographic/disability related variables, 3.6% of the variance was explained, $R^2 = .036$, $F_{(4,683)} = 6.42$, $p < .001$. Specifically, having a disease-related amputation was associated with lower levels of general adjustment. The inclusion of the coping factors resulted in a significant increase in predictive efficiency, $\Delta R^2 = .055$; $F_{(7,680)} = 9.80$, $p < .001$. *Avoidance* accounted solely for this increase ($\beta = -.36$, $t = 6.00$, $p < .001$), such that increased reliance on an avoidant coping strategy was associated with lower levels of general adjustment.

Social adaptation

The first block failed to successfully predict social adaptation scores, $R^2 = .004$, $F_{(4,686)} = .70$, $p = .59$. The addition of the block of coping scores, however, resulted in a significant increase in the amount of variance explained, $\Delta R^2 = .066$; $F_{(7,683)} = 7.38$, $p < .001$. Two of the coping strategies, s*eeking social support* ($\beta = .21$, $t = 3.87$, $p < .001$) and *avoidance* ($\beta = -.36$, $t = 6.83$, $p < .001$) contributed significantly to the resultant increase. Higher levels of *seeking social support* and lower levels of *avoidance* were associated with increased levels of social adaptation.

Discussion

In this study multiple facets of psychosocial functioning of individuals with lower limb amputations were significantly and differentially associated with demographic/disability related factors and coping strategies. The block of demographic/disability related factors predicted scores on four of the psychosocial outcome measures (i.e. anxiety, intrusion, adjustment to limitation and general adjustment). Of the specific predictors, time since amputation was significantly and negatively associated with anxiety and intrusion, and positively associated with adjustment to limitation. Thus, indicating that shorter time elapsed since amputation was associated with greater post-trauma psychological distress and anxious symptomatology, whereas greater time since amputation was associated with more favourable

adjustment to limitation. Previous research has also supported the suggestion that psychosocial adaptation to amputation occurs over time (e.g. Gallagher & MacLachlan, 2001; Livneh et al., 1999; Pezzin et al., 2000). In addition, age was significantly and negatively associated with adjustment to limitation, hence, younger age was associated with less favourable adjustment to limitation. This finding is also consistent with previous research demonstrating that relative youth is associated with less favourable post-amputation psychosocial adjustment (e.g. Fisher & Hanspal, 1998; Livneh et al., 1999; Tayseer, Al-Worikat, Said, Al-Thunaibat, & Suleiman, 1996).

Of particular interest is the substantial increase in explained variation in adaptation outcomes following the addition of coping strategies as predictors. Specifically, problem solving and social support seeking were significantly and negatively associated with symptoms of depression. Problem solving demonstrated a negative association with anxiety symptomatology. Furthermore, seeking social support was positively associated with social adaptation. Finally, avoidance was positively associated with symptoms of depression, anxiety and intrusion, and was negatively associated with general adjustment, social adaptation and adjustment to limitation.

Clearly, of the three coping strategies, *avoidance* was most consistently associated with poor psychosocial adaptation to amputation. The maladaptive nature of avoidant coping strategies has been noted in the wider coping literature and with reference to adaptation to illness and disability. For example, associations between greater reliance on avoidance and higher rates of depression (Spangenberg & Theron, 1999; Welch & Austin, 2001), anxiety (Nigro, 1996), and symptoms of post-traumatic stress (e.g. Bryant & Harvey, 1995; Eid, Thayer, & Johnsen, 1999; Solomon, Mikuliner, & Flum, 1988) have been documented. Amongst individuals with amputations avoidant and emotion-focussed coping strategies such as cognitive disengagement (i.e. denial and mental substitution, Livneh et al., 1999) have been associated with higher levels of psychosocial and physical dysfunction.

The positive association between problem solving and psychosocial outcomes evident in the current analyses is also consistent with results of prior research based on considerably smaller samples of individual with amputations. For example, Dunn (1996) concluded that finding positive meaning in one's amputation and perceiving greater control over one's impairment (i.e. active cognitive behavioural coping) were associated with lower levels of depressive symptomatology and higher levels of self esteem. Similarly, Livneh et al. (1999) found that active problem solving influenced a range of psychosocial adjustment measures. In their analyses higher levels of adjustment, acknowledgement, and

acceptance of disability were associated with more extensive utilisation of problem solving-based strategies, as were lower levels of internalised anger and depressive symptomatology.

In previous research contradictory results have emerged with respect to the effects of seeking social support on psychosocial well-being (e.g. Lazarus & Folkman, 1984; Penley, Tomaka, & Wiebe, 2002). Most cross-sectional studies report no association between seeking social support and physical or psychological outcome measures (Penley et al., 2002; Schreurs & de Ridder, 1997). However, greater social support seeking has been associated with better functioning among patients with rheumatoid arthritis, chronic obstructive lung disease and psoriasis (Scharloo et al., 1998) and higher quality of life among elderly individuals with hip and knee pain (Hopman-Rock, Kraaimaat, & Bijlsma, 1997). Emotion-oriented and avoidant strategies may in the long run be less adaptive than problem-oriented and approach strategies (Lazarus & Folkman, 1984). Carver, Scheier, & Kumari Weintraub's (1989) distinction between seeking social support for instrumental reasons, considered a problem-solving strategy, and seeking social support for emotional reasons, regarded as emotional-focussed coping, may offer some explanation for such discrepancies.

In the current analyses, seeking social support was associated with lower rates of depressive symptomatology, and was positively associated with social adaptation to prosthesis use. Thus it may be argued that in the current sample seeking social support functions largely as a problem-solving strategy. However, it may also be that amongst individuals with amputations the propensity to seek out emotional support may be as functional as seeking support for instrumental reasons. The correlational nature of this data does not permit identification of the temporal direction of the observed relationship between seeking social support and psychosocial adaptation. However, it seems likely that the relationship between seeking social support and social adaptation is bi-directional. On one hand, seeking social support may stimulate social adaptation. On the other hand, individuals who are able to show social adaptation may encourage more social support.

The primary aim of this analysis was to examine the relationships between coping strategies and several outcome measures of psychosocial adaptation to amputation. Consistent with the findings of Livneh et al. (1999) results reported here suggest that despite high intercorrelations, differential configurations of socio-demographic variables/disability-related factors and coping strategies independently predict various psychosocial outcomes. Some caution is required with respect to interpretation of these findings, however. First, participants in the current research represent a

specialised sample: the majority of BLESMA members are veterans with combat-related traumatic amputations. As individuals undergoing traumatic limb amputation, military or civilian, are characteristically working-age adults in otherwise good health, it is clear that the circumstances surrounding disease-related amputation, and the associated long-term prognoses, differ substantially from those surrounding traumatic amputation (Dougherty, 2001). Thus the generaliseability of the current findings to cases of disease-related amputation requires investigation. Indeed, given differences between cases of combat/military related amputation and civilian amputation, the generaliseability of the findings to this group also requires verification. The camaraderie or fellowship traditionally associated with military amputation may have led to bias in the findings. Second, consistent with the majority of amputation research the current sample is composed almost exclusively of male respondents. Additional research is also necessary to determine whether these findings generalise to females with amputations. Third, the cross-sectional nature of the study design precludes confirmation of the direction of the relationship between the predictor variables and adjustment variables. Longitudinal studies are necessary to determine the nature of these associations. Furthermore, we acknowledge that a longitudinal approach would allow greater exploration of process-oriented coping activities, which are necessarily dynamic and evolving. Fourth, as is the case with all mail surveys, the conditions under which the questionnaires were completed were uncontrolled and thus might have affected the study findings. In addition, the survey response rate and self-report nature of the design may have resulted in bias in the analysis. Finally, although the R^2 results reported here are relatively small, they nonetheless reflect statistically significant effect sizes. While such effect sizes may be less pertinent to service delivery at the individual level, they are important because they have clear implications for broader health service policy and planning.

With the limitations of the present findings in mind, there are some important implications of our research: the favourable effects of certain coping strategies, such as problem solving, and the negative effects of others, such as avoidance, suggests the potential benefits of interventions to reduce reliance on avoidant coping and stimulate more problem-focussed approaches to coping with difficulties and challenges in order to facilitate adaptation and prevent problems in psychosocial functioning.

In conclusion, this study provides greater insight into the relative contribution of demographic/disability-related factors and coping strategies to specific facets of psychosocial functioning in individuals with amputations. Interventions to promote positive coping strategies may be an effective approach to promoting positive psychosocial adjustment among individuals with amputations.

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