Goal pursuit and goal adjustment as predictors of disability and quality of life among individuals with a lower limb amputation: A prospective study

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Abstract

Objective: (1) To identify significant changes in disability and quality of life (QoL) across three time points (T1 = admission to rehabilitation, T2 = six weeks post-discharge, T3 = six months post-discharge) in individuals with lower limb amputation, and (2) to examine whether goal pursuit and goal adjustment at T1 were predictive of these outcomes at T3.

Design: Prospective cohort study.

Setting: Inpatient rehabilitation.

Participants: Consecutive sample of 64 persons aged 18 years and over with major lower limb amputation.

Interventions: Not applicable.

Main Outcome Measures: World Health Organisation Disability Assessment Schedule Version 2.0 (WHODAS 2.0); World Health Organisation Quality of Life Questionnaire-Brief Version (WHOQOL-BREF).

Results: Mean WHODAS 2.0 scores were in the 95th percentile at each time point. Scores on the WHODAS 2.0 and the physical, psychological and social relationships domains of the WHOQOL-BREF remained stable across the study period. Environmental QoL scores decreased from T1 to T2, but returned to near-baseline levels between T2 and T3. Having a greater tendency towards goal pursuit at T1 was predictive of higher physical and psychological QoL at T3, while having a stronger disposition towards goal adjustment at T1 predicted lower disability and higher environmental QoL at T3.

Conclusions: High levels of disability were experienced from admission to rehabilitation up to six months post-discharge. QoL in the physical, psychological and social relationships domains remained stable over the study period. Stronger goal pursuit and goal adjustment

tendencies on admission predicted lower disability and higher QoL six months post-discharge.

Key words: Amputation; rehabilitation; goals; quality of life; disability

Abbreviations

FGA	Flexible Goal Adjustment
ICF	International Classification of Functioning, Disability and Health
LLA	Lower Limb Amputation
MMSE	Mini Mental State Examination
QoL	Quality of Life
TGP	Tenacious Goal Pursuit
WHO	World Health Organisation
WHODAS 2.0	World Health Organisation Disability Assessment Schedule Version 2.0
WHOQOL-BREF	World Health Organisation Quality of Life Questionnaire-Brief Version

The loss of a limb presents individuals with extensive and evolving threats and challenges to their physical, psychological and social functioning (1). Outcome measurement is essential to effective rehabilitation practice and sound clinical decision-making (2). There are no definitive guidelines regarding best practice in measuring outcomes following lower limb amputation (LLA), as reflected in the heterogeneity of functional classification systems and assessment tools employed in this patient group (3). The World Health Organisation's (WHO) International Classification of Functioning, Disability and Health (ICF) (4) is a universal disability and health classification system that offers a generic framework for describing the consequences of illness and disability and the dynamic interplay of personal and environmental factors (5), and has been applied to a number of conditions, including LLA (5, 6). The ICF classifies functioning and disability into two components: (1) body functions and structures (at the level of the body or body part), which are interpreted through changes in physiological systems or anatomical structures; and (2) activities (at the level of the whole person) and participation (at the level of the whole person in a social context), which are interpreted through capacity and performance. The primary goal of rehabilitation is to achieve optimal functioning (as appropriate to the individual) at each of these levels (7). Recent reviews indicate that most rehabilitation outcomes research among persons with LLA has been at the level of body functions and structures (2) or specific activities such as mobility (6). Few studies have explicitly examined the impact of limb loss on participation, despite its

status as a key rehabilitation outcome (8). The limited evidence available indicates that amputation results in significant restrictions in participation, particularly in the areas of physical recreation, leisure activities, and employment (9, 10). Little is currently known about the experience of disability in the activity and participation component of the ICF among people with LLA, its trajectory over time, or associations with personal and environmental factors in this population (1, 9).

The ICF distinguishes further between disability (the limitations and restrictions experienced because of a health problem) and quality of life (QoL) (how the person feels about these limitations and restrictions) (11). Measures of QoL provide insight into the subjective experience of illness and disability, taking into account a broad range of areas including perceived health and physical functioning, social relationships, psychological well-being, and environmental support, and their inclusion in routine clinical assessment following amputation has been recommended (12). QoL is a complex issue, however, and research in this patient group has been hampered by methodological issues including heterogeneity of samples and measurement tools, and a surplus of cross-sectional designs (13, 14). Further longitudinal studies of QoL to examine changes in this outcome over time and assess its determinants among individuals with amputations are required. The first objective of the present study was thus to examine disability in the activity and participation component of the ICF and QoL among individuals with LLA across three time points (T1 = on admission to rehabilitation, T2 = 6 weeks post-discharge, T3 = 6 months post-discharge) in order to identify significant changes in these outcomes over the study period.

Identifying predictors of rehabilitation outcomes following LLA could aid in the early identification of at-risk individuals and inform the development of interventions to promote adjustment. Previous research on rehabilitation outcomes in this patient group has tended to focus on sociodemographic and amputation-specific predictors that are unchangeable and thus of limited use in terms of intervention. The ICF emphasises the important role that personal and environmental factors play in determining the functioning and disability of an individual with a health condition, and the characteristics of the person's specific condition are seen as an inadequate means of understanding or accounting for any aspect of disability experienced (4). The ICF does not provide explicit and testable hypotheses to improve our understanding of how these personal and environmental factors influence adjustment to illness and disability, however (15). Psychological models emphasise the primacy of individuals' subjective, phenomenological appraisals of their own resources, stressors and contextual issues in this process (16), and allow for the development of testable hypotheses and identification of predictors that are potentially amenable to change with appropriate intervention (15).

Theories of self-regulation may help to increase understanding of adjustment to LLA (17, 18). According to this perspective, human behaviour is organised around the pursuit of goals, which energise activities and give structure and meaning to people's lives and are thus closely linked with their subjective well-being (19-21). Indeed, negative associations have consistently been observed between perceived disruptions in goal attainment and psychological outcomes following illness and disability (22). To avoid the adverse consequences of goal failure and ensure that purpose in life and well-being are maintained, individuals must either overcome their difficulties through

continued striving towards goal attainment (goal pursuit), or abandon or scale down threatened goals and manage adverse emotional consequences (goal adjustment) (23, 24). Having a greater tendency towards goal pursuit and/or goal adjustment is associated with greater well-being among patients with acquired physical impairment, including stroke (25) and spinal cord injury (26).

The physical, psychological and social consequences of amputation are likely to constrain people's ability to attain their valued goals and, concomitantly, their subjective well-being, unless they regulate their goals appropriately in response to these challenges. Indeed, a recent cross-sectional study of 98 individuals with LLA found that stronger goal pursuit tendencies were associated with higher positive affect on admission to rehabilitation, while stronger goal adjustment tendencies were associated with lower negative affect (27). Goal pursuit and goal adjustment tendencies have not yet been examined longitudinally in this population, however, and their efficacy as predictors of disability and QoL is unknown.

The second objective of this study was to examine whether goal pursuit and goal adjustment tendencies at T1 were predictive of disability in the activity and participation component of the ICF and QoL at T3, controlling for baseline scores, sociodemographic and clinical variables.

Method

Participants

Recruitment took place in two urban hospitals in Ireland offering specialised multidisciplinary inpatient rehabilitation programmes for individuals with LLA. Patients consecutively admitted between February 2010 and July 2011 were eligible to participate if they: (1) were aged 18 years or over; (2) had a confirmed case of major LLA (i.e., above the level of the ankle) for which inpatient rehabilitation services had not previously been received; and (3) had sufficient English for the demands of the study. Patients who had a Mini Mental State Examination (MMSE) (28) score of <18, or were deemed unsuitable by the rehabilitation team's clinical psychologist due to a previous or current history of psychiatric morbidity, were excluded.

Procedure

The research protocol was approved by the Ethics Committees of both hospitals. Potential participants were identified by the consultant in charge of the rehabilitation programme in each hospital, and given an information sheet about the study by a researcher (L.C.). Those who agreed to participate provided written informed consent. The study employed a prospective cohort design; participants completed questionnaires on admission to inpatient rehabilitation (T1), 6 weeks post-discharge (T2), and six months post-discharge (T3). T1 questionnaires were administered in a structured interview format in the hospital. Depending on what was most convenient for the participant, T2 and T3 questionnaires were either delivered by post for self-

completion or administered by the researcher in a structured interview format during a home visit.

Measures

Sociodemographic data on age, gender, education level, marital status, and living situation were recorded at T1, in addition to clinical information regarding when amputation was performed, cause and level of amputation, presence of residual and phantom limb pain, and co-morbidities. Intensity of amputation-related pain was assessed using one item from the Brief Pain Inventory (BPI) (29). Participants rated their average experience of pain on a numeric rating scale ranging from 0 ('no pain') to 10 ('pain as bad as you can imagine').

Disability in the activity and participation component of the ICF was measured at each time point using the 12-item self-administered version of the WHO Disability Assessment Schedule 2.0 (WHODAS 2.0) (30), which assesses day-to-day functioning in six domains: understanding and communication; getting around; self-care; getting along with people; life activities; and participation in society. Participants were asked to indicate on a scale ranging from 1 ('none') to 5 ('extreme/cannot do') the amount of difficulty they experienced in performing each activity over the previous 30 days. An overall disability score was calculated; higher scores indicated greater disability. The WHODAS 2.0 has demonstrated good reliability and validity (31). A Cronbach's alpha value of 0.82 was observed at T3 in the current study.

QoL was assessed at each time point using the WHO Quality of Life Questionnaire-Brief Version (WHOQOL-BREF) (32). This measure consists of 24 items, rated on 5-point Likert scales, assessing either intensity, capacity, frequency, or satisfaction, and produces scores in four QoL-related domains: physical health; psychological; social relationships; and environmental. Participants responded based on their experiences over the previous four weeks. For each domain, higher scores denote better QoL. The WHOQOL-BREF demonstrates good validity and reliability (33), and has been successfully administered to persons with LLA (34). In the present study, Cronbach's alpha values for the physical, psychological, social relationships, and environment domains at T3 were 0.73, 0.83, 0.69, and 0.80, respectively.

Goal pursuit and goal adjustment were measured at T1 using the English version of the Tenacious Goal Pursuit (TGP) and Flexible Goal Adjustment (FGA) scales (35). The TGP scale assesses the tendency to persist in pursuing goals even in the face of setbacks and obstacles. The FGA scale measures readiness to disengage from blocked goals and focus on positive aspects of adverse situations. Each scale consists of 15 direct- and reverse-keyed items rated on a five-point Likert scale ranging from 0 ('completely disagree') to 4 ('completely agree'). Higher scores signify greater tendency to engage in these adaptive strategies. The TGP and FGA scales have been used in various patient populations (25, 26, 36) and have demonstrated satisfactory reliability and validity (35). In the present study, Cronbach's alpha values of 0.81 and 0.64 were observed at T1 for the TGP and FGA scales, respectively.

Statistical analyses

Analyses were conducted using SPSS Version 20 (IBM, 2010). Data were summarised as means and standard deviations for continuous variables, or frequencies and percentages for categorical variables. Repeated measures ANOVAs were conducted to test for significant changes in disability and QoL across the three time points. Where significant changes emerged, post-hoc pairwise comparisons (using a Bonferroni adjustment, $\alpha = .05/3 = .017$) were performed to identify group differences. Variables were assessed for normality prior to analysis. WHOQOL-BREF social relationships domain scores at T2 and T3 were positively skewed and underwent inverse square root transformation. Cause of amputation was recoded into a dichotomous dummy variable ('chronic' i.e., peripheral vascular disease, diabetes, cancer = 0; 'acute' i.e., accident, other = 1). Bivariate correlations and hierarchical multiple regression analyses were employed to examine relationships between predictor and outcome variables. For each regression analysis, baseline scores were controlled for in the first step, followed by sociodemographic (age, gender) and clinical (cause of amputation, average pain intensity) factors associated with disability and QoL in previous research in the second step, then TGP and FGA in the final step. Residual analyses indicated that the assumptions of multiple regression had not been violated. Post-hoc power calculations for the addition of Step 3 were conducted for each regression analysis using an online calculator (www.danielsoper.com).

Results

Sample characteristics

A total of 113 patients were eligible to participate during the recruitment period. Ninety-eight patients participated at T1; 75 contributed data at T2, and 64 contributed data at all three time points (see Figure 1). Sociodemographic and clinical characteristics of the sample at T3 are summarised in Table 1. The majority were male, married, had less than high school education, and lived with others. Peripheral vascular disease was the leading cause of amputation. Most individuals had co-morbidities and experienced phantom limb pain. The average intensity of amputation-related pain was within the mild range (M = 2.30, SD = 2.02).

Analyses of changes in outcome variables over time

Means and standard deviations for the WHODAS 2.0 and WHOQOL-BREF at T1, T2, and T3 are presented in Table 2. Mean WHODAS 2.0 scores place the sample above the 95th percentile for this outcome at each time point (30), indicating that participants experienced considerably greater disability than the majority of the population. A one-way repeated measures ANOVA indicated WHODAS 2.0 scores remained stable over the study period ($F_{(2, 122)}$ = 2.31, p = .104, partial η^2 = .036).

Significant changes were observed in scores on the environment domain of the WHOQOL-BREF ($F_{(2, 124)}$ = 5.28, p = .006, partial η^2 = .078). Pairwise comparisons (α = .017) revealed significant differences between T1 and T2 scores ($t_{(62)}$ = 2.79, p = .007), and T2 and T3 scores on environmental QoL ($t_{(62)}$ = -2.90, p = .005). Repeated

measures ANOVAs for QoL in the physical ($F_{(2, 124)} = 0.76$, $p = .757$), psychological ($F_{(2, 124)} = 2.78$, $p = .066$), and social relationships ($F_{(2, 124)} = 2.66$, $p = .074$) domains were non-significant across the three time points.

Analyses of TGP and FGA at T1 as predictors of outcome variables at T3

Table 3 presents descriptive statistics for predictor variables at T1 and outcome variables at T3, along with their bivariate intercorrelations. The hierarchical regression analysis predicting disability at T3 was significant. TGP and FGA together accounted for 10% of the variance in this outcome, controlling for baseline scores, sociodemographic and clinical variables (see Table 4). FGA was a significant predictor of disability at T3, in addition to baseline WHODAS 2.0 scores.

In the regression analyses predicting WHOQOL-BREF domain scores at T3, the addition of TGP and FGA in step three contributed significantly to the prediction of physical, psychological, and environmental QoL (see Table 4). TGP was an independent predictor of QoL in the physical and psychological domains, along with gender and T1 scores. For QoL in the social relationships domain, the only independent predictor to emerge was scores on this outcome at T1. Environmental QoL was significantly predicted by age, gender, and FGA, in addition to T1 scores.

Discussion

The first objective of the present study was to examine changes in WHODAS 2.0 and WHOQOL-BREF scores in a sample of individuals with LLA over three time points, from admission to rehabilitation up to six months after discharge. The results indicate

that participants' levels of disability in this component remained stable from rehabilitation admission up to six months after discharge. Average WHODAS 2.0 scores were in the 95th percentile at each time point in the current study, which indicates that participants experienced higher levels of disability in the activity and participation component of the ICF than most of the general population. Recovery following LLA involves assimilating back into the family, home environment, workplace, and community, which requires significant personal and environmental adaptations, and many individuals encounter ongoing barriers to activity and participation in many of these settings (9). The observation that disability scores remained stable over the study period underlines the importance of helping individuals with LLA to identify and minimise any potential barriers to activity and participation prior to discharge from rehabilitation, and providing them with ongoing support following discharge to ensure the best possibility of successful reintegration into home and community life.

Significant decreases were observed in the environment domain of the WHOQOL-BREF between admission to rehabilitation and six weeks post-discharge, but had returned to near-baseline levels by 6-month follow-up. This temporary dip in environmental QoL may have been due to practical issues that participants faced immediately upon return home such as delays in the completion of home or car modifications, which had been resolved by the final time point. In contrast, QoL in the physical, psychological, and social relationships domains remained stable over the study period. Similarly, Zidarov and colleagues (14) observed no significant changes in scores on 26 of the 27 items used to measure subjective QoL between rehabilitation admission and 3 months post-discharge in a sample of 19 individuals with an LLA.

WHOQOL-BREF domain scores at each time point were compared with preliminary normative data from an Australian population (37). Scores on the physical (M = 73.5, SD = 18.1) social relationships (M = 71.5, SD = 18.2), and environmental (M = 75.1, SD = 13.0) domains were higher in the comparison group in most cases, but were lower for the psychological domain at each time point (M = 70.6, SD = 14.0), indicating that on average participants experienced consistently better QoL in terms of their psychological well-being than observed in the general population.

The stability of QoL in the physical, psychological, and social relationships domains observed in the present study reflects the findings of a large body of research conducted with a variety of other patient groups (38), and is in accordance with the literature on 'response shift' phenomena, which proposes that this failure to show expected reductions in QoL despite significant health difficulties results from gradual changes in people's values, internal standards, or definition of what constitutes good QoL, in response to adverse experiences (39). Response shift phenomena have previously been invoked as an explanation for maintenance of QoL among individuals with an LLA (14).

The second objective of the present study was to examine whether goal pursuit (TGP) or goal adjustment (FGA) tendencies on rehabilitation admission were predictive of disability and QoL six months after discharge, controlling for baseline scores, sociodemographic and clinical characteristics. This was the first study to the authors' knowledge to examine these tendencies longitudinally among individuals with LLA. The findings indicate that higher FGA was the only significant predictor of lower levels of disability apart from baseline scores on this outcome, and also significantly

predicted higher QoL in the environment domain. Higher TGP, on the other hand, emerged as a significant predictor of higher QoL in the physical and psychological domains. These findings are consistent with previous research among persons with chronic illness and disability in which both TGP and FGA were associated with more positive adjustment outcomes (25, 26, 36). Studies examining goal pursuit and goal adjustment tendencies have centred almost exclusively on affective outcomes such as depression or life satisfaction. This is the first study to the authors' knowledge that has explored the relationships between these tendencies and either disability or specific domains of QoL. Given the emphasis placed on the role of personal factors in determining functioning and disability in the ICF and the findings of the present study, future research on TGP and FGA should expand its focus to include functional as well as psychological outcomes.

According to theories of self-regulation, goal pursuit and goal adjustment play complementary roles in the process of adjustment to adverse situations (23). Significant life events such as LLA usually involve a number of adaptive tasks, some requiring persistence, others flexibility. When adjusting to impairment, the individual may have to forego some of his or her personally valued goals in order to maintain others. This is supported by the present study's finding that TGP and FGA predicted different outcomes. Perhaps better opportunities were available to continue striving towards goals associated with physical and psychological QoL, whereas a greater number of irreversible obstacles were encountered in terms of disability in the activity and participation component of the ICF and environmental QoL, thus rendering FGA a more effective means of regulating one's goals in these domains.

With regard to sociodemographic and clinical characteristics, gender emerged as a significant predictor of physical, psychological, and environmental QoL in the present study, with females having higher scores in these domains. This contrasts with previous studies of QoL (13) and other psychosocial outcomes (1, 40) among people with LLA, in which males have tended to perform more favourably when gender differences are observed. Age was also significantly predictive of environmental QoL, with older individuals having higher scores at 6-month follow-up. This may be explained by the likelihood that older participants had pre-existing physical limitations and lived in environments that were already adapted to their needs as persons of limited mobility. Alternatively, it has been suggested that older adults might adjust more readily to amputation than younger individuals, as they view changes in mobility and body image due to limb loss as undesirable but somewhat expected at their age (40). This view is reciprocated in the literature on self-regulation, which proposes that people come to rely increasingly on goal adjustment strategies as they grow older, which helps maintain a sense of well-being and satisfaction in the face of age-related losses and limitations (23, 35). The limited capacity of amputation etiology and pain intensity to predict disability and QoL in the present study lends further support to the argument that the characteristics of an individual's health condition are insufficient in explaining the nature or extent of disability he or she experiences (4, 15).

Overall, the findings indicate that theories of self-regulation can provide useful insights into the process of adjustment to illness and disability. It has been suggested that the preservation of subjective well-being observed in response shift phenomena (39) may reflect general processes that occur as part of normal self-regulation rather than being

unique to the experience of ill health and disability (43). Indeed, goal adjustment processes bear a striking resemblance to descriptions of the response shift, and may offer an alternative explanation for how people maintain high QoL in the face of adversity. These results provide prospective evidence for the efficacy of goal pursuit and goal adjustment tendencies in predicting short-term rehabilitation outcomes among individuals with LLA. The TGP/FGA scales (35) might thus prove valuable as screening tools for the early identification of individuals at risk for poorer adjustment.

Although TGP and FGA represent dispositional tendencies towards goal pursuit and goal adjustment respectively, fluctuations are thought to occur in these tendencies over the life course, suggesting that they are amenable to change (23). The findings of the present study thus indicate the potential value of developing rehabilitation-based interventions to foster adoption of these adaptive strategies. This could be achieved through encouraging patients to continue striving towards attainable goals and providing them with support and guidance in adjusting or dissolving commitment to goals that are no longer feasible (36). Indeed, a recently developed cognitive-behavioural therapy intervention for rheumatic diseases, theoretically grounded in self-regulation, included sessions specifically targeted at enhancing both goal pursuit and goal adjustment, and resulted in significant improvements in psychological distress, illness acceptance and QoL that were maintained at 12-month follow-up (44). Interventions based on this perspective are particularly suited to rehabilitation contexts given their shared focus on the person's goals, and could easily be adopted into the goal-oriented approach that is already common practice in these settings (17, 18). Future research should investigate the efficacy of such interventions in enhancing the adaptive use of goal pursuit and goal

adjustment strategies, and, concomitantly, rehabilitation outcomes, following LLA and other forms of acquired disability.

Study limitations

Attrition is a major obstacle in conducting longitudinal research among individuals with LLA, due to the morbidity and mortality associated with chronic amputation etiologies. In the present study, the sample size decreased from 98 participants at T1 to 64 at T3 (65% of the original sample), which is in keeping with previous longitudinal studies of this population with similar timeframes (41, 42). Another limitation was the restricted timeframe of the study. More extensive longitudinal studies are required to investigate the trajectory of disability and QoL beyond this period, and their associations with TGP and FGA. Furthermore, although the time points selected capture an important period of time in the rehabilitation of individuals with LLA, it remains unclear whether changes in environmental QoL occurred before or after its completion. An additional assessment of outcomes immediately following discharge from rehabilitation might have offered a clearer picture of the adjustment process by allowing for the effects of rehabilitation to be separated from the effects of activity in the six weeks following discharge. The representativeness of the sample might have been compromised by recruitment of participants from prosthetic rehabilitation programmes. These patients are likely to represent a healthier and more able-bodied sector of this population, as many individuals who undergo amputation never attend formal rehabilitation (45). Recruiting patients from hospital settings post-amputation might increase the generalizability of findings, although previous authors have highlighted the significant challenges involved (41). Finally, although using generic measures to assess disability and QoL in the present study enabled comparison of scores with the general population, these measures do

not incorporate condition-specific aspects of living with an amputation. Future research on these outcomes should consider the inclusion of amputation-specific as well as generic measures to capture the idiosyncrasies of this condition (14).

Conclusion

The findings indicate that disability in the activity and participation component of the ICF and QoL remain relatively stable in individuals with LLA from rehabilitation admission up to six months after discharge. Having a greater tendency towards tenaciously pursuing goals on admission to rehabilitation following LLA was predictive of higher physical and psychological QoL six months post-discharge, while having a stronger disposition towards flexibly adjusting goals at baseline was predictive of lower disability and higher environmental QoL at 6-month follow-up. Goal pursuit and goal adjustment represent important targets for interventions to enhance long-term rehabilitation outcomes in this patient group.

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Table 1. Sociodemographic and clinical characteristics of the final sample (N = 64).

Variable	*n*	%
Gender		
Male	53	82.8
Female	11	17.2
Education		
< high school	29	45.3
High school	21	32.8
> high school	14	21.9
Marital status		
Single	12	18.8
Married	33	51.6
Separated	4	6.3
Divorced	6	9.4
Widowed	9	14.1
Living situation		
Alone	23	35.9
With partner	19	29.7
With partner and children	13	20.3
With family	6	9.4
With others	2	3.1
Nursing home	1	1.6
Level of amputation		
Below-knee	31	48.4

Above-knee	28	43.8
Bilateral	5	7.8
Cause of amputation		
Peripheral vascular disease	34	53.1
Diabetes	15	23.4
Cancer	1	1.6
Accident	6	9.4
Other	8	12.5
Presence of comorbidities		
Yes	54	84.4
No	10	15.6
Residual limb pain		
Yes	20	31.3
No	44	68.8
Phantom limb pain		
Yes	48	75
No	16	25

Variable	Mean ± *SD*	Range
Age (years)	63.56 ± 11.96	61 (28-89)
Time since amputation (weeks)	31.56 ± 42.84*	200 (6-260)
Average pain intensity	2.30 ± 2.02	11 (0-10)

* median time since amputation = 20 weeks

Table 2. Descriptive statistics for WHODAS 2.0 and WHOQOL-BREF at each time point for the final sample (N = 64).

Variable	Number of items	Possible range	T1 *M* (*SD*)	T2 *M* (*SD*)	T3 *M* (*SD*)
WHODAS 2.0	12	0-100	38.24 (14.72)	35.32 (19.60)	33.64 (17.16)
WHOQOL-BREF physical	7	0-100	66.18 (15.48)	64.63 (18.00)	65.96 (15.55)
WHOQOL-BREF psychological	6	0-100	74.87 (15.16)	72.02 (17.10)	71.55 (16.05)
WHOQOL-BREF social relationships	3	0-100	72.79 (13.79)	68.12 (21.85)	68.88 (19.86)
WHOQOL-BREF environment	8	0-100	67.82 (15.37)	61.81 (20.79)	66.46 (17.73)

Note: The means and standard deviations reported for QoL social relationships at T2 and T3 were calculated prior to transformation

Table 3. Descriptive statistics and intercorrelations for T1 predictor and T3 outcome variables.

	Variable	Mean (or %)	*SD*	1	2	3	4	5	6	7	8	9	10
1.	Age	63.56	11.96	-									
2.	Gender (female)	17	-	0.05	-								
3.	Cause of amputation (acute)	22	-	-0.63**	0.06	-							
4.	Average pain intensity (T1)	2.30	2.02	-0.30**	-0.01	0.28*	-						
5.	TGP (T1)	33.52	8.02	-0.24	-0.17	0.26*	-0.08	-					
6.	FGA (T1)	39.84	4.99	0.26*	-0.07	-0.29*	-0.26*	0.44**	-				
7.	WHODAS 2.0 (T3)	33.64	17.16	-0.05	-0.02	0.05	0.17	-0.30*	-0.42**	-			
8.	WHOQOL-BREF physical (T3)	65.96	15.55	0.23	0.13	-0.14	-0.12	0.25*	0.32*	-0.62**	-		
9.	WHOQOL-BREF psychological (T3)	71.55	16.05	0.18	0.12	-0.26*	-0.07	0.35**	0.44**	-0.49**	0.64**	-	
10.	WHOQOL-BREF social relationships (T3)	68.88	19.86	-0.15	-0.01	0.28*	0.02	-0.11	-0.18	0.29*	-0.55**	-0.57**	-
11.	WHOQOL-BREF environment (T3)	66.46	17.73	0.25*	0.09	-0.15	-0.28*	0.23	0.40**	-0.53**	0.66**	0.66**	-0.45**

Note: An inverse transformation was performed on QoL social relationships at T3, and the direction of the correlation coefficients for this variable should be reversed prior to interpretation. The mean and standard deviation reported for this variable were calculated prior to transformation.

* $p \leq .05$; ** $p \leq .01$

Table 4. Summary of hierarchical regression analyses predicting T3 outcome variables.

Variable	WHODAS 2.0 (T3)		WHOQOL-BREF physical (T3)		WHOQOL-BREF psychological (T3)		WHOQOL-BREF social relationships (T3)		WHOQOL-BREF environment (T3)	
	β	*ΔR²*	*β*	*ΔR²*	*β*	*ΔR²*	*β*	*ΔR²*	*β*	*ΔR²*
Step 1		.166***		.195***		.438***		.268***		.272***
Outcome variable (T1)	0.40**		0.41**		0.60***		-0.50***		0.48***	
Step 2		.047		.077		.114**		.031		.115*
Age	-0.03		0.27		0.11		-0.01		0.30*	
Gender	-0.02		0.25*		0.35***		-0.12		0.22*	
Cause of amputation	-0.25		0.11		-0.13		0.22		0.22	
Average pain intensity (T1)	0.07		0.01		0.04		-0.06		-0.12	
Step 3		.100*		.083*		.063*		.021		.084*
Tenacious goal pursuit (T1)	-0.07		0.26*		0.26*		-0.17		0.13	
Flexible goal adjustment (T1)	-0.31*		0.11		0.08		0.10		0.24*	
Adj. R^2	0.235		0.275		0.567		0.235		0.405	
ANOVA results for final model	$F(7, 55) = 3.725$**		$F(7, 56) = 4.418$***		$F(7, 56) = 12.794$***		$F(7, 56) = 3.920$**		$F(7, 56) = 7.120$*	

Observed power for addition of Step 3	0.724	0.676	0.784	0.201	0.771

Note: An inverse transformation was performed on QoL social relationships at T3, and the direction of scores on this variable should be reversed prior to interpretation. * $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$

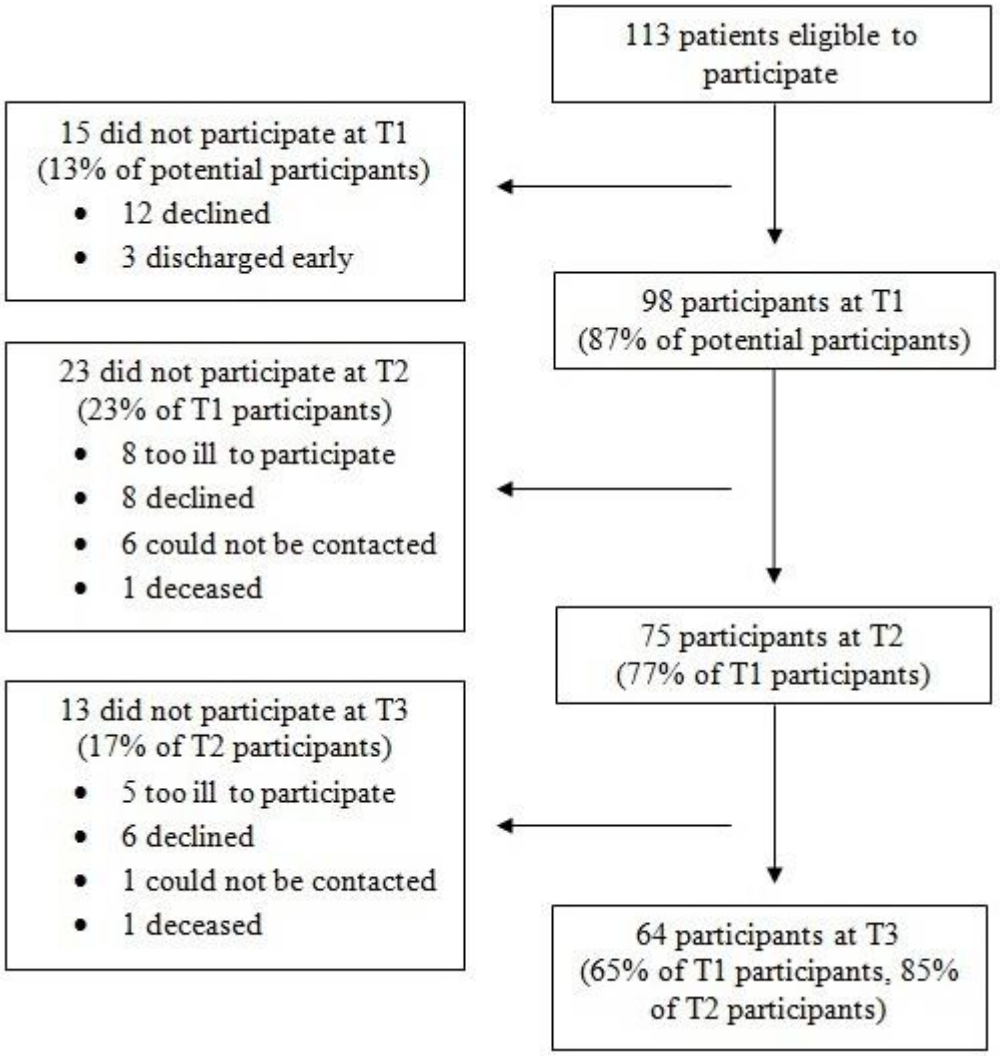

Figure 1. Flow diagram of recruitment process and participation rates.