

Spirituality and Quality of Life in Limb Amputees

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Abstract

Limb amputation is a life-changing event that signifies long-term physical, social, psychological, and environmental change. Spiritual well-being in patients plays a significant role in coping and may affect outcomes of patients with limb loss. The objective of this study was to describe the role of spirituality in individuals with limb amputation and to determine whether spirituality is related to the quality of life (QOL) in this sample. Study participants were recruited through prosthetists, physicians, amputee support groups, the Amputee Coalition of America, and amputee listserv discussion groups in the United States and Canada. Participants completed questionnaires containing measures of satisfaction with life, general health, mobility, and social integration. A quantitative descriptive research design was used to examine the relationships between existential spirituality (belief that one's life is meaningful or has purpose) and religious spirituality and QOL among individuals with limb amputation. A prospective study of 108 patients with a history of limb amputation was performed. The study population consisted of 66.3% males and 33.7% females. Most patients were Caucasian (96.2%). Of the 108 participants, 86 (79.6%) were 41 years of age or older with a mean of 18 years since amputation. The most frequent cause of amputation was trauma (55.6%) and the most common location of amputation was below-the-knee (49.1%). Existential spirituality, female gender, and age above 50 years related to higher QOL in patients with a history of limb amputation. The findings of this research confirmed that amputees use spirituality to cope with limb amputation. Existential spirituality was a significant predictor of satisfaction with life, general health, and social integration.

Keywords

- ▶ quality of life
- ▶ spirituality
- ▶ well-being
- ▶ coping
- ▶ spirituality
- ▶ limb amputation

In the United States, there are ~1.7 million individuals living with limb loss.¹ One in 190 Americans currently live with the loss of limb and this number is estimated to double by the year 2050.¹ Data collected by the National Limb Loss Information Center (2008) reported that the rates of trauma- and cancer-related amputations have declined although the number of amputations related to vascular disease has increased.²

Limb amputation is a life-changing event that signifies long-term physical, social, psychological, and environmental changes.³ Adjustment to disability is not based solely on the degree of impairment, but is also impacted by psychological and psychosocial factors.³ Psychological sequelae demon-

strate an important role in determining the quality of life (QOL) and level of disability.⁴ An important indicator of subjective well-being after amputation is the ability of an individual to perform daily activities and regain independence.⁵ Individuals facing disability often seek to find meaning and purpose in their disability.⁶ A 7-year follow-up of the Lower Extremity Assessment Project (LEAP) provided evidence that wide ranging variations in outcome following major limb trauma was more affected by the patient's economic, social, and personal resources than by initial treatment of the injury.⁷ Factors that were not associated with injury or treatment but were found to be related to poorer

outcomes among patients with amputation and leg-threatening injuries were low level of education, nonwhite race, poverty, smoking, involvement with disability-compensation litigation, and lack of private health insurance.⁸ Factors related to poorer outcomes among patients affected functional status, resulting in restrictions of activities and participation in life roles.⁷ The rehabilitation of individuals with amputation is the minimization of handicap and establishment of autonomy and well-being. Spiritual beliefs enable individuals with disability to establish meaning for disability and effective coping in response to loss related to disability.⁹ The World Health Organization's primary domains of QOL include (1) physical, (2) psychological, (3) level of independence, (4) social relationships, (5) environment, and (6) spirituality/religion/personal beliefs.¹⁰

The specific purpose of this study was to describe the role of spirituality in a sample of individuals with limb amputation and to determine whether spirituality is related to QOL in this population. Treating the mind, body, and spirit in patients is important to the physical and psychological adjustment to illness and injury.¹¹ With greater emphasis on evidence-based practice in a cost-conscious health care system, health care workers, providers, and leaders of health care must be able to rationalize their actions with evidence generated by scientific research. Spiritual well-being in patients plays a significant role in coping with illness and demonstrates moderate to strong correlations with physical, emotional, and functional well-being.¹² Relatively little research is available examining the effects of spirituality on QOL among individuals with limb amputation. One research study examined spirituality and QOL among individuals with spinal cord injury.¹³ Existential spirituality was the only significant predictor of global and social QOL in this patient population. Recent survey data collected from primary care clinics of six academic medical centers in three different states reported 66% of participants believe that physicians should consider their spiritual needs during medical encounters.¹⁴

Medical education of clinicians in the 20th century is grounded in the Cartesian model, based on a rigid mind-body separation.¹⁵ Most clinicians do not receive education on spiritual assessment, and the inclusion of spirituality and religion in patient care is rare.^{16,17} Despite research reporting that Americans believe that spirituality plays an important role in their health and QOL, the biomedical model of medicine has neglected the existential questions and spirituality issues that accompany illness, focusing instead on diagnosis and treatment.^{15,18,19} Understanding spirituality's effects on patients' abilities to cope with amputation is an important component in rehabilitation of patients with limb amputations.²⁰

Materials and Methods

A prospective study with institutional review board approval was performed on amputees with traumatic and nontraumatic injuries. The study population consisted of patients 18 years of age or older. Types of limb amputations included were (1) above-the-elbow, (2) below-the-elbow, (3) above-

the-knee, (4) below-the-knee, (5) total foot, (6) wrist disarticulation, (7) hip disarticulation, (8) hemipelvectomy, (9) knee disarticulation, (10) partial foot, and (11) Syme. Single digit or ray amputations were excluded. The study population of individuals with limb amputations was compiled from prosthetists, physicians, amputee support groups, the American Coalition of Amputees (ACA), and amputee listserv discussion groups. Individuals with limb amputations who were interested in participating in the research were given contact information. The physician specialties' included general surgery, orthopedic surgery, plastic and reconstructive surgery, and vascular surgery.

A convenience sampling method was used. Study participants were recruited from 15 U.S. states and Canada. Data were collected through mailed questionnaires. An introduction letter and informed consent were sent along with the questionnaire and demographic survey to each potential participant inviting them to complete the questionnaire, explaining the importance of participation, purpose of the study, voluntary nature of the study, and assurance of confidentiality.

Spirituality was measured using Paloutzian and Ellison's Spiritual Well-Being Scale.²¹ The two types of spiritual well-being identified in research were existential and religious.¹⁹ Existential spiritual well-being referred to the belief that one's life was meaningful or had purpose.²¹ Religious well-being referred to a meaningful relationship with God.²¹

The Spiritual Well-Being Scale was designed to measure QOL based on two subscales: religious well-being and existential well-being. The existential subscale contained 10 questions that measured life satisfaction and direction was not based on a specific faith or ideology. The religious well-being scale measured an individual's well-being in relation to God. Spiritual well-being was a general indicator of health and well-being therefore it was appropriate to use the Spiritual Well-Being Scale to assess and correlate QOL and well-being among patients following amputation.²²

Three instruments used to measure global, physical, and social QOL were (1) The Satisfaction with Life Scale, (2) Duke Health Profile, and (3) Craig Handicap Assessment and Reporting Technique (CHART). Global QOL was measured using Satisfaction with Life Scale and the general health subscale of the Duke Health Profile. Physical QOL was assessed using the physical independence and mobility subscales of the CHART. Social QOL was measured using the social integration subscale of the CHART.

The Satisfaction with Life Scale was developed as a measure of the judgmental component of subjective well-being.²³ The Satisfaction with Life Scale consists of five questions designed to measure cognitive judgments of life satisfaction. Items are rated on a Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The test takes less than 1 minute to complete with scores ranging from 5 to 35. Higher scores are associated with higher levels of satisfaction with life.

The Duke Health Profile is a 17-item generic questionnaire instrument designed to measure adult self-reported functional health status during a 1-week time frame. The Duke

Health Profile instrument consists of 10 scales: 6 health subscales and 4 dysfunctional scales. The six health scales are (1) physical health, (2) mental health, (3) social health, (4) general health, (5) perceived health, and (6) self-esteem. The four dysfunctional scales are (1) anxiety, (2) depression, (3) pain, and (4) disability. Each item has three responses: (1) Yes, describes me exactly, (2) Somewhat describes me, and (3) No, doesn't describe me at all.²⁴

CHART is a 32-item measure designed to provide a subjective measure of the degree to which impairments and disabilities result in handicaps.²⁵ CHART scales identify the level of community integration and social participation evaluating the effect of rehabilitation on handicap.²⁶ CHART produces an overall score and six separate scores for each of the six separate subscales: (1) physical independence, (2) cognitive independence, (3) mobility, (4) occupation, (5) social integration, and (6) economic self-sufficiency. Scores range from 0 to 100. For each domain a maximum score of 100 indicates no handicap in that dimension, that is, roles within the domain are fulfilled at a level equivalent to a normal individual.¹⁷ A score of 0 indicates maximum handicap.

Statistical Analyses

A regression causal analysis was conducted using multiple regressions. Five standard multiple regression analyses were conducted to determine whether there was a relationship between spirituality (existential and religious) and global QOL, physical QOL, and social QOL. Causal multiple regression analysis was used to separate the effects of existential and religious spirituality on the dependent variables of QOL. Existential spirituality and religious spirituality were primary predictor variables. Age, level of education, level of amputation, and time postamputation were collected and examined as potentially mediating variables. Finally, to ascertain any additional significant relationships, the Satisfaction with Life Scale, the physical, mental, social, and general health subscores of the Duke Health Profile, the CHART, and the existential and religious well-being subscores of the Spiritual Well-Being Scale were intercorrelated. Data analysis was conducted with StataCorp version 9.2 (StataCorp, College Station, TX).

Results

The study included 108 participants with 66.3% males and 33.7% females. Races included Caucasian (92.6%), Hispanic (2.8%), Asian (2.8%), and African-American (1.8%). Marital status consisted of married (70.1%), divorced/separated (11.1%), single (10.2%), widowed (5.6%), and no response (2.9%). Highest level of education obtained included: graduate degree (21.3%), college degree (38.9%), some college (17.6%), and high school degree (22.2%). Approximately 46% reported employment. The majority of participants (58.3%) were 51 years of age and older. Of the 108 participants, 86 (79.6%) were 41 years of age and older. Trauma (55.6%), vascular disease (22.2%), cancer (9.3%), congenital deformity (3.7%), and other (9.3%) were the causes of amputation (►Table 1). Below-the-knee amputations (49.1%) were the

most location (►Table 2). Time since amputation spanned from less than a year to more than 20 years. There was a mean of 18 years since amputation. Half of the study participants had an amputation for 5 years or less.

To explore for significant relationships between variables, the Satisfaction with Life Scale, the physical, mental, social, and general health subscores of the Duke Health Profile Scale, the social integration and mobility subscores of the CHART, and the existential and religious well-being subscores of the Spiritual Well-Being Scale were correlated. Several significant correlations, ranging from a low of 0.21 to a high of 0.81 were observed (see ►Table 3).

Significant correlations between the various subscores of the Duke Health Profile were observed, ranging from 0.21 to 0.81. Similarly, significant correlations among the various subscales of the CHART, ranging from 0.30 to 0.44, were also present. The general health subscale of the Duke Health Profile was the only scale that was significantly correlated to the physical independence subscale of the CHART ($r = 0.21$; $p < 0.05$).

Satisfaction with life was significantly correlated with all variables except the physical independence subscale of the CHART. The physical independence subscale of the CHART measured the individual's ability to sustain an independent existence.

Religious well-being was significantly correlated to only three of the nine variables. Religious well-being was significantly correlated to existential well-being ($r = 0.31$, $p < 0.01$), satisfaction with life ($r = 0.26$, $p < 0.01$), and the social health subscale of the Duke Health Profile ($r = 0.31$, $p < 0.01$). Existential well-being was significantly correlated to all variables except the physical independence subscale of the CHART (see ►Table 3). Satisfaction with life was significantly correlated to the same variables as existential well-being. Satisfaction with life was not correlated to the physical independence subscale of the CHART. Significant correlations between existential well-being and satisfaction with life and between religious well-being and satisfaction with life lend general support that spirituality has a salutary relationship with subjective well-being. When comparing existential well-being and religious well-being, existential well-being had a stronger correlation with satisfaction with life ($r = 0.73$, $p < 0.01$).

The first regression analysis examining global QOL was conducted using the Satisfaction with Life Scale and the second regression analysis used the general health subscale

Table 1 Causes of Amputation

Cause	n = 108	%
Trauma	60	55.6
Vascular disease	24	22.2
Cancer	10	9.3
Congenital deformity	4	3.7
Other	10	9.3

Table 2 Levels of Amputation

Site of Amputation	n = 108	%
Below-the-elbow	4	3.7
Above-the-elbow	1	0.9
Below-the-knee	53	49.1
Above-the-knee	26	24.1
Hip disarticulation	1	0.9
Hemipelvectomy	1	0.9
Knee disarticulation	2	1.9
Partial foot	2	1.9
Syme amputation	2	1.9
Other	16	14.8

of the Duke Health Profile. The overall variance in satisfaction with life explained by the satisfaction with life model was 64.6%. Existential well-being and gender were two significant predictors of satisfaction with life. For every one-point increase in the existential score, the satisfaction with life score will, on an average, increase by 0.62 points.

Existential spirituality, gender, and age were three significant predictors in the regression analysis that examined general health among individuals with limb amputation. For every one-point increase in the existential spirituality score, the general health subscale score of the Duke Health Profile did, on an average, increase by 1.10 points. Males, on an average, had a general subscale score of 7.04 points lower than females. Subjects 50 years of age or younger, on an average, had a general health subscale score 7.60 points lower than subjects older than 50 years of age. No other predictors

were significant. Male participants, on an average, had a satisfaction with life score 3.26 points lower than the female participants.

Two regression analyses were conducted to examine physical QOL. The first regression analysis used the physical independence subscale of the CHART while the second analysis used the mobility subscale of the CHART. Both models examining physical QOL were rejected because the *F* test for all variables in both models was not significant. Existential well-being and age were found to be statistically significant in the physical independence model, but as the *F* test was not significant it was not prudent to draw conclusions from the significance of these variables.

One regression analysis was conducted to examine social QOL. The overall variance in social integration explained in the social integration regression analysis was 38.6%. Existential spirituality was significantly correlated with the social integration subscore of the CHART ($r = 0.47, p < 0.01$), with the two measures sharing 22.0% of the variance. Existential spirituality and age were two significant predictors in this analysis. For every one-point increase in the existential spirituality score, the social integration subscale of the CHART will, on average, increase by 0.88 points. Subjects 50 years of age or younger, on average, had a social integration score 8.88 points lower than subjects older than 50 years of age. No significant correlation between religious well-being and social integration subscore of the CHART existed.

Discussion

The main purpose of this descriptive, quantitative research study was to examine the relationship among the independent variables of existential and religious spirituality with the dependent variable, QOL, among individuals with amputation. The results revealed that a significant correlation existed

Table 3 Correlations of Primary Study Variables

Overall Correlations	1	2	3	4	5	6	7	8	9	10
1. RWBS	–	0.31 ^a	0.26 ^a	–0.14	0.02	0.31 ^a	0.06	–0.15	–0.07	0.11
2. EWBS		–	0.73 ^a	0.29 ^a	0.59 ^a	0.62 ^a	0.62 ^a	0.18	0.25 ^b	0.47 ^a
3. SWLS			–	0.34 ^a	0.60 ^a	0.50 ^a	0.61 ^a	0.15	0.25 ^b	0.35 ^a
4. Physical health (subscale of DHP)				–	0.43 ^a	0.31 ^a	0.77 ^a	0.16	0.29 ^a	0.24 ^a
5. Mental health (subscale of DHP)					–	0.50 ^a	0.81 ^a	0.14	0.34 ^a	0.29 ^a
6. Social health (subscale of DHP)						–	0.74 ^a	0.17	0.31 ^a	0.45 ^a
7. General health (subscale of DHP)							–	0.21 ^b	0.39 ^a	0.40 ^a
8. Physical independence (subscale of CHART)								–	0.44 ^a	0.44 ^a
9. Mobility (subscale of CHART)									–	0.30 ^a
10. Social integration (subscale of CHART)										–

^a*p* < 0.01.

^b*p* < 0.05.

²⁷RWBS, Religious Well-Being Scale; ⁵EWBS, Existential Well-Being Scale; ⁸SWLS, Satisfaction With Life Scale; ^{6,18,28,29}DHP, Duke Health Profile; ^{11,15,22}CHART, Craig Handicap Assessment Reporting Technique.

between existential spirituality and the Satisfaction with Life Scale ($r = 0.73$, $p < 0.01$). Existential spirituality was also significantly correlated with the general health subscale of the Duke Health Profile ($r = 0.62$, $p < 0.01$) and the social integration subscale of the CHART ($r = 0.47$, $p < 0.01$). Religious spirituality did not emerge as a significant predictor in any of the tested models. This is consistent with research examining existential and religious spirituality.^{14,27} Religious well-being was not found to be a significant predictor in QOL.

The results of this study suggest that existential spirituality is related to QOL among individuals with limb amputations. Existential spirituality was found to be a significant predictor of satisfaction with life, general health, and social integration among amputees. Individuals facing significant life changes resulting from a limb amputation may use existential spirituality to mediate the effects of illness on their well-being. An association between existential spirituality and QOL is clear although the nature of the association between QOL and existential spirituality is complex. Additional research examining the changing nature of spirituality during the course of rehabilitation is recommended to gain more understanding of the interrelated factors impacting the quality of life among individuals with limb amputations.

The generalizability of the findings may be limited because of the geographic location and ethnic composition of the sample. Individuals with limb amputations are a specialized and difficult group of individuals to reach. With hard to reach populations, a series of studies with nonprobability sample suggest rough estimates of the population manifesting characteristics. The recruitment and identification of research participants from physicians, prosthetists, and support group leaders improved the ability to identify individuals with amputations who fit the study's selection criteria but may have produced selection bias. The lack of representation of minorities limits the interpretation of findings. Study participants were limited to subjects who agreed to participate voluntarily in the completion of the survey instruments.

Conclusions

The results of the research suggest that existential spirituality (belief that one's life is meaningful or has purpose), is related to global and social QOL in individuals with limb amputations. Religious spirituality (a meaningful relationship with God) was not a predictor of global, physical, or social QOL. There was a significant correlation between existential spirituality and the Satisfaction with Life Scale ($r = 0.73$, $p < 0.01$). Existential spirituality was also significantly correlated with the general health subscale of the Duke Health Profile ($r = 0.62$, $p < 0.01$) and the social integration subscale of the CHART ($r = 0.47$, $p < 0.01$). Religious spirituality did not emerge as a significant predictor in any of the tested models. A longitudinal examination of the development and changing nature of spirituality throughout the course of rehabilitation after amputation would assist in a clearer understanding of the construct of existential spirituality. Existential spirituality may be attained from a variety of states, of which is more

closely related to individual religiosity. The construct of spiritual well-being in this research was deconstructed so that the impact of spiritual and religious could be better understood. Spiritual well-being exists on a continuum in all individuals.

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