Research Article

Spiritual well-being and quality of life in patients with spinal cord injury: A study from Iran

Marzieh Hajiaghababaei¹, Hooshang Saberi ², Parvin Rahnama^{†3}, Ali Montazeri ⁴

¹Psychosomatic Medicine Research Center, Tehran University of Medical Sciences, Tehran, Iran, ²Brain and Spinal Cord Injury Research Center (BASIR), Neuroscience Institute, Tehran University of Medical Sciences, Tehran, Iran, ³Department of Midwifery, Shahed University, Tehran, Iran, ⁴Population Health Research Group, Health Metrics Research Center, Iranian Institute for Health Sciences Research, ACECR, Tehran, Iran

Objective: To assess the relationship between spiritual well-being and health-related quality of life (QOL) among patients with spinal cord injury (SCI).

Setting: Brain and SCI Research Center, Neuroscience Institute, Tehran University of Medical Sciences, Tehran, Iran.

Methods: This was a cross-sectional study. A sample of patients with SCI participated in the study and completed two questionnaires: the Short-Form 36-Item Health Survey (SF-36) in order to collect data on vitality, social functioning, mental health and role emotional and the Spiritual Well-Being Scale (SWBS) to measure religious and existential well-being. The association between spiritual well-being and health-related QOL was then assessed.

Results: In all 213 patients were studied. The mean age of patients was 43.5 (SD = 10.8) years, and most were male (77.5%). The results obtained from generalized linear regression analysis indicated that religious well-being and existential well-being were significant contributing factors to improved vitality, social functioning, mental health and role emotional.

Conclusion: The findings suggest that having higher levels of spiritual well-being might improve quality of life in people with spinal cord injury.

Keywords: Spirituality, Spinal cord injury, Quality of life, Well-being

Introduction

There is evidence that life expectancy has increased for individuals with spinal cord injury (SCI).¹ Thus, in addition to quantity, quality of life is a key issue for this population.² Patients with SCI have to deal with multiple challenges including physical and psychological problems after injury. It is argued that with improving survival, we might only prolong suffering in these patients.^{3,4} However, patients with SCI may adapt coping strategies to deal with their problems. Indeed, spiritual/religious coping is among approaches that many patients with SCI might use it as a coping strategy.⁵⁻⁸

Spiritual well-being has been defined as “a subjective belief system that incorporates self-awareness and reference to a transcendence dimension, provides meaning and purpose in life, and feelings of connectedness with God or the larger reality”.⁹ There are a number of instruments that measure spiritual well-being. The Spiritual Wellness Inventory (SWI),¹⁰ the Spiritual Assessment Inventory (SAI),¹¹ and the Spiritual Well-Being Scale (SWBS),¹² are among the most popular measures of spirituality. Research has demonstrated spirituality or religion may be closely associated with other positive outcomes after SCI. For instance, one study showed that there was association between existential spiritual well-being, life satisfaction and general health in patients with SCI.¹³ Furthermore in a scoping review of the literature on the relationship

[†]Dr Rahnama passed away peacefully on the 12th April 2018.

Correspondence to: Ali Montazeri, Population Health Research Group, Health Metrics Research Center, Iranian Institute for Health Sciences Research, PO Box 131451756, Enghelab Street, Nazari V. Street, Tehran, Iran. Email: montazeri@acecr.ac.ir

between spirituality, adjustment and resilience after spinal cord injury (SCI), spirituality was found to have a positive association with life satisfaction, quality of life, mental health and resilience.¹³

It is argued that spiritual well-being might improve emotional health in these patients and thus better quality of life.¹⁴ However, existing studies are mostly focused on diseases other than spinal cord injury.^{15–17}

This study aimed to examine the association between spiritual well-being and quality of life in patients with spinal cord injury. It was thought the findings might help to develop and implement strategies for improving quality of life in this vulnerable population.

Materials and methods

Design and participants

This was a cross-sectional study carried out in Tehran, Iran. Participants were patients with SCI attending the Brain and Spinal Cord Research Center affiliated to Tehran University of Medical Sciences. Criteria for inclusion were: being at least 18 years old, and willing to participate in the study. They were excluded if they were physically unable to respond to the study questionnaires. All patients were examined by a neurosurgeon and included traumatic spinal cord injured (both complete and incomplete) cases. The severity of impairment was recorded using the ASIA impairment scale (AIS) on a 5-point level from A to E, complete (grade A) versus incomplete (grades B–E).¹⁸

Sample size

Using the general rule of thumb for regression analysis as suggested by Harell,¹⁹ we estimated 15 cases per parameter (predictor). As such, a study with 210 patients (14 parameters x 15) would have a power of 80% at 5% significance level. However, we actually recruited 213 patients for the study.

Questionnaires

The following measures were used to fulfill the study objectives:

1. The Spiritual Well-Being Scale (SWBS) was used to evaluate spiritual well-being. The SWBS is a 20-item questionnaire that consists of two sub-scales: a religious well-being and an existential well-being. Each item is rated on a six-point Likert scale (from 1 to 6), giving a total score ranging from 20 to 120 where the higher scores indicate greater well-being. The religious well-being subscale provides a self-assessment of one's relationship with God, while the existential well-being subscale gives a self-assessment of one's sense of life purpose and life satisfaction. The SWBS is more a measure of personal spiritual beliefs and not

participation in organized religion activities.¹² The psychometric properties of the Iranian version of questionnaire are well documented.²⁰

2. The Short-Form 36-Item Health Survey (SF-36) was used to measure health-related quality of life. The questionnaire measures eight health related concepts: physical functioning (PF-10 items), role limitations due to physical problems (RP-4 items), bodily pain (BP-2 items), general health perceptions (GH-5 items), vitality (VT-4 items), social functioning (SF-2 items), role limitations due to emotional problems (RE-3 items), and perceived mental health (MH-5 items).²¹ Higher scores on the eight domains suggest higher health related quality of life. However, for the purpose of this study we only used the four mental health related subscales that are vitality, social functioning, role emotional and perceived mental health. The psychometric properties of the Iranian version of SF-36 are well documented.²²

Analysis

Descriptive analysis was carried out to explore the data. We used generalized linear models to indicate factors predicting quality of life. Vitality, social functioning, role emotional, and mental health were treated as outcome variables. The patients' demographic, injury-related characteristics and spiritual well-being scores were considered as independent factors. A univariate analysis was performed to identify significant correlates of mental health subscales. The level of significance was set at 5%. The β coefficient and 95% confidence intervals was reported as indication of any association between dependent and independent variables. The negative values for β indicate a negative relationship, while positive values indicate a positive relationship.

Ethics

The Review Board of the Brain and SCI Research Center, Neuroscience Institute, Tehran University of Medical Sciences, Tehran, Iran approved the study. All participants gave written consent prior to participation.

Results

The study sample

In all 220 patients with spinal cord injury were approached. Of these 213 patients were included in the study. Seven patients with insufficient hand function or who were very physically ill were excluded. There were no refusals. The mean age of patients was 33.7 (SD = 9.5) years. The characteristics of the sample are shown in Table 1. There were no significant differences in spiritual well being either for different age groups or between males and females.

Table 1 The characteristics of the study sample (n = 213).

Age (years)	
Mean (SD)	33.7 (9.5)
Range	19–63
Sex (No., %)	
Male	165 (77.5)
Female	48 (22.5)
Education (No., %)	
Primary	37 (17.4)
Secondary	131 (61.5)
Higher	45 (21.1)
Marital status (No., %)	
Single	78 (36.6)
Married	113 (53.1)
Divorce	22 (10.3)
Employment status (No., %)	
Employed	30 (14.1)
Unemployed	183 (85.9)
Neurological classification of SCI (AIS; No., %)	
Incomplete	99 (46.5)
Complete	114 (53.5)
Level of SCI (No., %)	
Quadriplegic	60 (28.1)
Paraplegic	153 (71.9)
Time since injury (year)	
Mean (SD)	4.0 (5.0)
Range	0.08–33.0
Spiritual well-being (mean, SD)	
Religious well-being	50.9 (9.0)
Existential well-being	41.3 (10.1)
Quality of life (mean, SD)	
Vitality (VT)	62.0 (21.4)
Social functioning (SF)	61.4 (27.3)
Role emotional (RE)	60.2 (31.4)
Mental health (MH)	66.7 (20.1)

Factors associated with patients' quality of life

The results obtained from generalized linear models demonstrated that age, male sex, lower education,

Table 4 Generalized linear model analysis for role-emotional as dependent variable.

	β (95% Wald CI)	P
Age	–0.47 (–0.49, –0.45)	<0.001
Sex		
Female	Reference group	
Male	0.63 (0.22, 1.03)	0.002
Education		
Higher	Reference group	
Secondary	–8.510 (–8.90, –8.11)	<0.001
Primary	–18.16 (–18.67, –17.65)	<0.001
Marital status		
Divorced	Reference group	
Married	15.235 (14.5, 15.8)	<0.001
Single	20.628 (19.9, 21.2)	<0.001
Time since injury	1.17 (1.14, 1.20)	<0.001
ASIA Impairment Scale (AIS)		
Incomplete	Reference group	
Complete	4.24 (3.93, 4.55)	<0.001
Spiritual well-being		
Existential well being	1.05 (1.04, 1.07)	<0.001
Religious well-being	–0.17 (–0.19, –0.15)	<0.001

being single, time since injury, complete AIS, and existential and religious well-being were significant factors contributing to all quality of life subscales being examined (Tables 2–5). As shown in Tables 2 to 5 male sex was the most important independent variable that contributed to *vitality* and *social functioning* while marital status was the most important contributing factor to *social functioning* and *mental health*. Notably spirituality had much smaller Betas than other factors suggesting that its contribution to quality of life was relatively small.

Table 2 Generalized linear model analysis for vitality as dependent variable.

	β (95% Wald CI)	P
Age	–2.30 (0.250, –0.209)	<0.001
Sex		
Female	Reference group	
Male	9.30 (8.91, 9.70)	<0.001
Education		
Higher	Reference group	
Secondary	4.04 (3.65, 4.44)	<0.001
Primary	3.12 (2.58, 3.65)	<0.001
Marital status		
Divorced	Reference group	
Married	0.21 (0.83, 0.40)	0.493
Single	2.95 (2.32, 3.58)	<0.001
Time since injury	0.28 (0.25, 0.32)	<0.001
ASIA Impairment Scale (AIS)		
Incomplete	Reference group	
Complete	1.28 (1.19, 1.59)	<0.001
Spiritual well-being		
Existential well being	0.83 (0.81, 0.84)	<0.001
Religious well-being	0.36 (0.34, 0.38)	<0.001

Table 3 Generalized linear model analysis for social functioning as dependent variable.

	β (95% Wald CI)	P
Age	–0.53 (–0.55, –0.51)	<0.001
Sex		
Female	Reference group	
Male	7.43 (7.04, 7.81)	<0.001
Education		
Higher	Reference group	
Secondary	4.39 (4.00, 4.78)	<0.001
Primary	–2.26 (–2.76, –1.75)	<0.001
Marital status		
Divorced	Reference group	
Married	11.17 (10.59, 11.75)	<0.001
Single	9.83 (9.23, 10.44)	<0.001
Time since injury	0.49 (0.46, 0.52)	<0.001
ASIA Impairment Scale (AIS)		
Incomplete	Reference group	
Complete	1.97 (1.67, 2.27)	<0.001
Spiritual well-being		
Existential well being	0.69 (0.67, 0.70)	<0.001
Religious well-being	0.06 (0.04, 0.08)	<0.001

Table 5 Generalized linear model analysis for mental health as dependent variable.

	β (95% Wald CI)	P
Age	0.05 (0.03, 0.07)	<0.001
Sex		
Female	Reference group	
Male	4.26 (3.87, 4.66)	<0.001
Education		
Higher	Reference group	
Secondary	2.54 (2.15, 2.93)	<0.001
Primary	-5.11 (-5.64, -4.57)	<0.001
Marital status		
Divorced	Reference group	
Married	2.48 (1.87, 3.09)	<0.001
Single	7.88 (7.25, 8.51)	<0.001
Time since injury	-0.23 (-0.26, -0.20)	<0.001
ASIA Impairment Scale (AIS)		
Incomplete	Reference group	
Complete	1.34 (1.03, 1.64)	<0.001
Spiritual well-being		
Existential well-being,	0.89 (0.87, 0.90)	<0.001
Religious well-being	0.26 (0.24, 0.28)	<0.001

Discussion

The study results indicated that there was a relationship between spiritual well-being (existential and religious well-being) and mental components of quality of life as measured by the Short Form Health Survey (SF-36). Similar observations have been reported for association between spirituality and mental health in patients with life-threatening diseases and disability. For instance a study on relationship between spirituality and mental well-being in a sample of people with human immunodeficiency virus (HIV) and acquired immunodeficiency syndrome (AIDS) using the Spiritual Well-Being Scale and the Medical Outcomes Study Questionnaire found that spirituality, sexual orientation, age and HIV symptoms contributed significantly to mental well-being and functional health status in this population.²³ Also a meta-analysis of the research findings on correlation between spirituality and mental health in cancer patients reported that the correlation between spirituality and mental health generally was positive.

There was unexpected finding where correlation between religious well-being and role emotional was in opposite direction (Table 4). There was a negative association between religious well-being and role emotional. We feel this finding requires additional consideration. Contribution of factors such as cultural differences and religious background may need further investigation. In general, 95% of Iranians believe in God²⁴ and a considerable number of people (83%) practice religious obligations.²⁵ Indeed, patients with spinal cord injury are not significantly different from the general population with respect to religious beliefs.

However, they are somewhat limited in doing their practices and thus might emotionally feel downhearted. For instance, if they want to go to shrines or practice religious duties which needs some physical actions they might experience a sort of inability that in turn provides them unpleasant feelings.

Studies from different parts of the world have reported similar findings on spirituality and quality of life indicating that although people may be from different cultures, perhaps many refer to one conceptual phenomenon that is worship and seeking help from a superpower source that is God. For example a study evaluated spiritual well-being among outpatients with cancer in USA and found that greater spiritual well-being was correlated with greater quality of life and well-being and with less depression, anxiety, fatigue and pain.²⁶ Another descriptive, cross sectional study examined associations between spiritual well-being and health-related quality of life among African-American women with HIV/AIDS and reported that existential well-being was significantly positively associated with the physical and mental composites of HRQOL.²⁷ An exploratory study on relationships between quality of life, spiritual well-being, and psychological adjustment styles for people living with leukemia showed that spiritual well-being and quality of life were both significantly negatively correlated with hopelessness/helplessness, fatalism, and anxious preoccupation, suggesting that people who are able to find meaning in their illness are more likely to utilize functional psychological adjustment styles.²⁸

The results demonstrated a positive association between time since injury and quality of life. Similar findings were observed in studies by Westgren and Levi where compared to those who recently injured, quality of life was better in persons injured many years ago.²⁹ Furthermore we found that the QOL was associated with AIS level. In fact, the results obtained from this study indicated that patients with complete SCI were more likely to report better quality of life. Although the findings may appear somewhat paradoxical, it seems that those with complete SCI might adjust to their conditions better than those who are suffering from incomplete SCI. Similarly, a study among medical rehabilitation inpatients found that participants who suffered a loss of mobility control or who had no recovery had higher positive religious coping scores than those who had improvement in mobility control.³⁰

Lastly, we found that age correlated negatively with most outcomes but not with mental health (Table 5). There is evidence that in most instances older people present with better mental health. For instance, a

population study from Iran using the SF-36 showed that older age was associated with higher score for mental health.²²

The strong positive relationship between spirituality and quality of life has been reported in other similar groups with physical disability.^{31,32} There are several explanations that might help to justify this association. One explanation for the association between spirituality and quality of life is that communication with a supernatural power, that is God, would help a disabled person to adjust better with his/her new condition. and thus report a better quality of life.³³ Maggi *et al.* pointed out that when a person perceives receiving everlasting support, he or she might even forget his/her incurable disorders and cope with the problems and difficulties better.³¹

However, one should bear in mind that there is also possibility of inverse relationship between spirituality and health outcomes, i.e. stronger beliefs or spiritual practice might result in poorer outcomes.^{34,35} For instance a person with strong religious belief and having spinal cord injury might wish to practice his/her religious duties such as fasting while this might harm his or her health even if a doctor say that he or she should not fast.

In general, the findings of the present study indicated that spirituality is not the main source of improved quality of life nor could it be ignored, especially in communities where religious beliefs are part of people's everyday life. It seems that those who are responsible for caring for patients with spinal cord injury should notice that interventions with modest spiritual elements could benefit patients. Indeed, rehabilitation programs could include plans that are spiritual in nature. Such programs could include visits to religious places or shrines, meetings with religious leaders in the society and involvement in charity activities. However, the findings from this study are limited and we are unable to make more explicit recommendations except to suggest additional research that would be beneficial to provide information to guide practice. Qualitative studies or surveys in which there can be more exploration of attitudes toward spirituality and its effects on life might help guide future action.

The present study had several limitations. First, we recruited a convenience sample from patients referred to one medical center. Therefore, our findings may not be generalized to all patients with the SCI. Secondly, this was a cross sectional study and thus causal association between spiritual health and quality of life could not be established. Thirdly, those who were physically unable to complete the survey were excluded and this might have influenced the results. Finally, we did not measure other psychological variables such as

depression, anxiety, hopelessness and social integration. These might mediate associations between spirituality and the quality of life and thus findings should be interpreted with caution.

Conclusion

The findings indicated that vitality, social functioning, role emotional and mental health among Iranian patients with spinal cord injury were correlated with existential well-being, religious well-being, age, sex, education, marital status, time since injury, and the degree of spinal cord impairment.

Acknowledgments

We thank all patients who participated in the study.

Disclaimer statements

Contributors There is no contributor other than authors.

Funding This research has been supported by Tehran University of Medical Sciences and Health Services [grant number 19801].

Conflict of interest The authors declare that they have no conflict of interest.

Ethics approval The Review Board of the Brain and SCI Research Center, Neuroscience Institute, Tehran University of Medical Sciences, Tehran, Iran.

ORCID

Hooshang Saberi <http://orcid.org/0000-0002-6611-3919>

Ali Montazeri <http://orcid.org/0000-0002-5198-9539>

References

- 1 Turk MA. Secondary conditions and disability. In: Field MJ, Jette AM, Martin L, editors. Workshop on disability in America: a new look. Washington (DC): Natl Acad Pr; 2006:185–93
- 2 Hammell KW. Exploring quality of life following high spinal cord injury: a review and critique. *Spinal Cord* 2004;42(9):491–502.
- 3 Harvey L. Management of Spinal Cord Injuries. A Guide for Physiotherapists. Philadelphia: Churchill Livingstone 2008.
- 4 Craig A, Tran Y, Middleton J. Psychological morbidity and spinal cord injury: A systematic review. *Spinal Cord* 2009;47(2):108–14
- 5 Babamohamadi H, Negarandeh R, Dehghan-Nayeri N. Coping strategies used by people with spinal cord injury: a qualitative study. *Spinal Cord* 2011;49(7):832–7
- 6 Brillhart B. A study of spirituality and life satisfaction among persons with spinal cord injury. *Rehabil Nurs* 2005;30(1):31–4.
- 7 Soderstrom KE, Martinson IM. Patients' spiritual coping strategies: A study of nurse and patient perspectives. *Oncol Nurse Forum* 1987;14(2):41–6
- 8 Johnstone B1, Glass BA, Oliver RE. Religion and disability: clinical, research and training considerations for rehabilitation professionals. *Disabil Rehabil* 2007;29(15):1153–63
- 9 Bensley, R. J. Defining spiritual health: A review of the literature. *Health Educ. J* 1991;22(5):287–90.
- 10 Ingersoll RE. Teaching a course on counseling and spirituality. *Counselor Education and Supervision*. 1997;36(3):224

- 11 Hall TW, Edwards KJ. The Spiritual Assessment Inventory: A theistic model and measure for assessing spiritual development. *Journal for the Scientific Study of Religion*. 2002;41(2):341–57.
- 12 Paloutzian RF, Ellison CW. Loneliness, spiritual well-being, and quality of life. In: Peplau LA, Perlman D (eds). *Loneliness: a Sourcebook of Current Theory, Research and Therapy*. Wiley: New York, NY, USA. 1982:224–237.
- 13 Matheis EN, Tulskey DS, Matheis, RJ. The relationship between spirituality and quality of life among individuals with spinal cord injury. *Rehab Psychol* 2006;51(3):265–71.
- 14 Finocchiaro DN, Roth PA, Connelly CD. Spiritual Well-Being as Predictor of Quality of Life for Adults with Paraplegia. *Rehabil Nurs* 2014;39(6):285–93.
- 15 Lanfredi M, Candini V, Buizza C, Ferrari C, Boero ME, Giobbio GM, de Girolamo G. The effect of service satisfaction and spiritual well-being on the quality of life of patients with schizophrenia. *Psychiatry Res* 2014;216(2):185–191.
- 16 Dalmida SG, Holstad MM, DiIorio C, Laderman G. Spiritual well-being and health-related quality of life among African-American women with HIV/AIDS. *Appl Res Qual Life* 2011; 6 (2):139–157.
- 17 Jafari N, Farajzadegan Z, Zamani A, Bahrami F, Emami H, Loghmani, A. Spiritual well-being and quality of life in Iranian women with breast cancer undergoing radiation therapy. *Support Care Cancer* 2013;21(5):1219–1225
- 18 Kirshblum SC, Burns SP, Biering-Sorensen F, *et al*. International standards for neurological classification of spinal cord injury (Revised 2011). *J Spinal Cord Med*. 2011;34(6):535–546
- 19 Harrell, F. *Regression modeling strategies: with applications to linear models, logistic and ordinal regression, and survival analysis.*: New York, NY, USA, Springer;2015:11–40.
- 20 Baljani E, Khashabi J, Amanpour E, Azimi N. Relationship between spiritual well-being, religion, and hope among patients with cancer. *HAYAT* 2011;17(3):27–37.
- 21 Ware JE, Sherbourne CD. The MOS 36-Item Health Survey (SF-36). I. Conceptual framework and item selection. *Med Care* 1992; 30(6):473–483.
- 22 Montazeri A, Goshtasebi A, Vahdaninia M, Gandek B. The Short Form Health Survey (SF-36): translation and validation study of the Iranian version. *Qual Life Res* 2005;14(3):875–82.
- 23 Coleman CL. Spirituality and sexual orientation: relationship to mental well-being and functional health status. *J Adv Nurs* 2003; 43(5):457–464.
- 24 Religion in Iran. Available from: https://en.wikipedia.org/wiki/Religion_in_Iran#cite_note-62
- 25 Crabtree S, Pelham B. What Alabamians and Iranians Have in Common. Available from: <http://www.gallup.com/poll/114211/alabamians-iranians-common.aspx>
- 26 Rabow MW, Knish SJ. Spiritual well-being among outpatients with cancer receiving concurrent oncologic and palliative care. *SUPPORT CARE CANCER* 2015;23(4):919–23.
- 27 Dalmida SG, Holstad MM, DiIorio C, Laderman G. Spiritual well-being and health-related quality of life among African-American women with HIV/AIDS. *Appl Res Qual Life* 2011; 6 (2):139–57.
- 28 O'Connor M, Guilfoyle A, Breen L, Mukhardt F, Fisher C. Relationships between quality of life, spiritual well-being, and psychological adjustment styles for people living with leukaemia: An exploratory study. *Ment Health Relig Cult* 2007;10(6): 631–47.
- 29 Westgren N, Levi R. Quality of life and traumatic SCI. *Arch Phys Med Rehabil* 1998;79(11):1433–9.
- 30 Fitchett G, Rybarczyk BD, DeMarco GA, & Nicholas JJ. The role of religion in medical rehabilitation outcomes: A longitudinal study. *Rehabil Psychol* 1999;44(4):333–53.
- 31 Maggi L, Ferrara PE, Aprile I, Ronconi G, Specchia A, Nigito C, *et al*. Role of spiritual beliefs on disability and health-related quality of life in acute inpatient rehabilitation unit. *Eur J Phys Rehab Med* 2012;48(3):467–73.
- 32 Elliott BA, Elliott TE. Chronic Pain Management: Impact on Spiritual Functioning and Quality of Life. *Qual Life Res* 2010; 19:123–4.
- 33 Curtis AM, Werthel DP. *Religion and healthcare* Nova Science Publishers. Hauppauge, N.Y. 2012: 137.
- 34 Connor KM, Davidson JR, Lee LC. Spirituality, resilience, and anger in survivors of violent trauma: A community survey. *J Trauma Stress* 2003;16(5):487–94.
- 35 Lee LC, Connor KM, Davidson JR. Eastern and Western spiritual beliefs and violent trauma: A US national community survey. *Traumatology* 2008;14(3):68.