Life satisfaction and life values in people with spinal cord injury living in three Asian countries: A multicultural study

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Objective: To compare the differences in life satisfaction and life values among people with spinal cord injury (SCI) living in three economically similar Asian countries: India, Vietnam, and Sri Lanka.

Design: Cross-sectional and comparative investigation using the unified questionnaire.

Setting: Indian Spinal Injuries Centre in New Delhi (India), Spinal Cord Rehabilitation Department of the Bach Mai Hospital in Hanoi (Vietnam), and Foundation for the Rehabilitation of the Disabled in Colombo (Sri Lanka).

Participants: Two hundred and thirty-seven people with SCI using a wheelchair; 79 from India, 92 from Vietnam, and 66 from Sri Lanka.

Outcome measures: Life Satisfaction Questionnaire, Chinese Value Survey.

Results: People with SCI in Vietnam had significantly higher general life satisfaction than participants in India and Sri Lanka. Significant differences were identified in several demographic and life situation variables among the three Asian countries. With regard to “Traditional”, “Universal”, and “Personal” life values significant differences among three participating countries were identified in all domains. No significant relationships were identified between life satisfaction and life values for people with SCI in India, Vietnam, or Sri Lanka.

Conclusion: It could be presumed that particular demographic and life situation variables are more powerful factors of life satisfaction following SCI than the dominant culture of a country expressed by life values.

Keywords: Spinal cord injuries, Life satisfaction, Life values, Wheelchair, Rehabilitation, Disability, Vietnam, Sri Lanka, India

Introduction

Research has described life satisfaction as well as factors associated with subjective life quality for people with spinal cord injury (SCI) on the basis of SCI samples from numerous developed countries.^{1–3} To date, however, there is limited information on life satisfaction in people with SCI living in developing countries. The growing body of literature on life satisfaction after SCI reflects serious interest in assessing the person’s perceived life satisfaction under certain socio-demographic conditions. Several different instruments have been used for self-reports of life satisfaction, and thus results achieved by different studies are not directly comparable. For reasons of comparisons this study is

focused on reports in which the Life Satisfaction Questionnaire (LiSat-9) has been used.⁴ Further use of the LiSat-9 has been recommended in order to facilitate comparisons with other studies evaluating subjective life quality among people with SCI.¹

More than a decade ago Bränholm *et al.*⁵ reported significantly lower satisfaction with life as a whole, with primary activities of daily living performance, leisure, and sexual life in 97 people with SCI in Sweden compared to a reference Swedish population. All other aspects of satisfaction were comparable with those of the reference group. This Swedish finding was confirmed by Budh and Österåker² who also found that people with SCI ($n = 190$) had significantly lower levels of vocational satisfaction than the general Swedish population. In a Dutch investigation of people with SCI with complete as well as incomplete injuries, among whom 60% used a wheelchair for

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primary mobility, Post *et al.*³ found that those with SCI ($n = 315$) had lower levels than the controls in all nine items except satisfaction with their financial situation and with contacts with friends and acquaintances. Schönherr *et al.*⁶ studied participation (defined as reintegration in vocational and leisure activities) and life satisfaction after SCI ($n = 57$) in the Netherlands. A total of 38 respondents (67%) reported being satisfied with their lives in general, according to the LiSat-9. Comparison of the subgroups with persons who were satisfied and not satisfied with their lives revealed significantly lower satisfaction with the work and leisure situation of the dissatisfied group. Also from the Netherlands, van Koppenhagen *et al.*¹ performed a prospective study of 147 people with SCI who completed the LiSat-9 checklist at the start of active rehabilitation (the moment that a person could sit for 3–4 hours) and 1 year after discharge from in-patient rehabilitation. In agreement with others, these authors found that satisfaction with life as a whole, primary daily activities, leisure, vocation, and sexual life decreased significantly at the second point of measurement. The pre-injury levels of life satisfaction, as reported by them at the commencement of active rehabilitation, were so remarkably high, that a “Pollyanna” effect (i.e. idealizing life prior to the lesion) may have been a biasing factor to explain the marked decreases in life satisfaction. On the other hand, the authors themselves suggested that comparing people with SCI with reference groups might result in underestimation of the negative impact of spinal cord lesion on life satisfaction. In a large sample of people with SCI ($n = 985$), treated at three rehabilitation centers in the UK, Tasiemski *et al.*⁷ found that by comparison with the reference populations of the Swedish and Dutch, life satisfaction was lower for people with SCI in nearly all LiSat-9 items of the checklist.

Studies on life satisfaction following SCI in developing countries are very rare. Tasiemski *et al.*⁸ studied 14 earthquake survivors with SCI from Sichuan Province in China. The most satisfying areas of life, according

to LiSat-9, were partnership relations and contacts with friends. The least satisfying was vocational situation. Comparing life satisfaction and mood between two small selected samples of persons with tetraplegia from the UK and China, Songhuai *et al.*⁹ noted that the British sample had significantly higher satisfaction derived from vocational and financial situation and from family life than the Chinese. The British sample highly (80%) valued their life despite severe disability, whereas the Chinese sample only marginally (57%) valued life. Table 1 shows satisfaction with various life domains in people with SCI living in different countries.

Previous research has shown that our knowledge regarding life satisfaction in people with SCI living in developed countries is broad and regularly updated with new publications. On the other hand, our information about life satisfaction in people with SCI living in developing countries is non-existent or very limited at best. The results of previous cross-cultural research has shown that life satisfaction in people with SCI is different in different parts of the world. The reason for this may be the cultural background of a particular country, especially regarding preferred life values. However, it is not known if it is true for people with SCI living in different countries within the same continent, e.g. Asia.

The main aim of this study was to compare level of life satisfaction and life values among people with SCI living in three economically similar (based on monthly income) Asian countries: India, Vietnam, and Sri Lanka. It was hypothesized that identified differences in life values will correlate with differences in life satisfaction among people with SCI living in those countries. Another important aim was to determine whether life values are significantly different among these three Asian countries.

Method

Procedure

People with SCI who fulfilled the following criteria were invited to participate in the survey: (1) diagnosis of SCI,

Table 1 Life satisfaction in people with SCI living in different countries

LiSat-9 domain	Sweden ⁴ (median)	Nederland ⁶ (mean)	England ⁹ (median)*	China ⁹ (median)*
Self-care ability	5.0	4.4	3.0	2.0
Leisure situation	4.0	4.7	4.0	4.0
Vocational situation	4.0	4.3	4.5	2.0
Financial situation	4.0	4.3	4.0	2.0
Sexual life	3.0	3.3	1.5	2.0
Partnership relations	5.0	4.7	5.0	5.0
Family life	5.0	5.1	5.5	5.0
Contacts with friends	5.0	5.0	4.0	5.0

*Sample included only people with tetraplegia.

(2) wheelchair use in all daily activities, (3) age 18–50 years at the time of injury, and (4) at least 1 year since injury. All of those who agreed to participate were informed about the study background and objectives, and were asked to complete the consent form before entering the study. Study participants were recruited through institutions involved in the project, i.e. Indian Spinal Injuries Centre in New Delhi (India), Spinal Cord Rehabilitation Department of the Bach Mai Hospital in Hanoi (Vietnam), and Foundation for the Rehabilitation of the Disabled in Colombo (Sri Lanka).

All measures as well as project overview and consent form were translated from English to participants' national languages by at least two sworn translators (using back translation method). The SPSS Company in Cracow, Poland, created an electronic tool for this study called IBM SPSS Data Collection. This complete technology platform supports entire survey research or feedback gathering process, from design and data collection to analysis and reporting. The questionnaires were available for study participants through the secure project web page. All people recruited for the study were given individual codes to access the survey. All data entered by study participants were saved in the real time on the SPSS server in Poland. Those participants who did not have access to the Internet could complete printed version of the questionnaire. Afterwards the data were entered to the electronic system by the Asian partner of this project.

Measures

Several measures were used in this study.

1. Present life situation was assessed with the questionnaire covering questions related to several aspects of life i.e. highest educational achievement, present vocational activity, present income (in comparison to average monthly net income in a country), housing (adapted or not to individual people needs), and time needed (in hours) to get to the nearest rehabilitation center from participants' places of living (by available means of transport).
2. Demographic questionnaire included questions related to basic personal data (gender, date of birth, and marital status) as well as questions regarding SCI data (level of injury, date of injury, cause of injury, complications following SCI, and type of wheelchair used). Both "Present life situation" assessment and "Demographic questionnaire" were reviewed with professionals in SCI rehabilitation working in participating Asian countries in order to make sure that all the questions are appropriate to the situation in developing countries.
3. Life satisfaction was assessed with the LiSat-9 developed by Fugl-Meyer *et al.*⁴ The aim of this measure

is to find out how satisfactory are different aspects of people lives. The nine-item version contains a single item assessing overall life satisfaction along with eight additional items that are domain-specific: self-care, leisure, vocation, finances, sexuality, partner relationship, family, and social contact. All nine items are answered on a six-point Likert scale that ranges from 1 (very dissatisfied), to 6 (very satisfied). The reliability and utility of the LiSat-9 in SCI populations has been demonstrated, and previously used in assessing life satisfaction in people with SCI, also in Asia.^{3,7–9} Previous studies demonstrated that the 6-graded LiSat-9 scale can be validly dichotomized into scale-grades 6 and 5 (very satisfied/satisfied) labelled as "satisfied" versus 1–4 (rather satisfied/rather dissatisfied/dissatisfied/very dissatisfied) labelled as "not satisfied".⁴ Several of the items of LiSat-9 have been found to show acceptable test–retest reliability, specificity, and sensitivity.¹⁰ Further, in the recent study Tasiemski and Brewer¹¹ provided evidence in support of the internal consistency of the LiSat-9 for people with SCI ($\alpha = 0.85$).

4. Life values were identified on the basis of the Chinese Value Survey (CVS), developed by Bond.¹² The aim of this measure is to find out what matters are important or unimportant to Eastern minded people. The survey includes 40 items. Participants expressed their opinion on each statement giving the number from (1) stands for "of no importance to me at all" to (9) stands for "of supreme importance to me." The measure has been widely used in measuring Eastern life values.^{14,15} The factors developed from the CVS vary from study to study due to the different samples used.^{13–15} People with SCI consist a very specific group, hence the simple use of the factors identified by other researchers might not be appropriate.

Analysis

SPSS was used for statistical analysis. Due to lack of normal distribution of tested variables (checked with ShapiroWilk test) non-parametric statistics were used for analysis. Results of LiSat-9 and CVS were analyzed using the Kruskal–Wallis one-way analysis of variance by ranks.

Factor analysis of CVS for people with SCI was performed using maximum likelihood extraction method (rotation method: Promax with Kaiser normalization). Indexes of CVS dimensions were created by summing all variables loading on a particular factor.

General life satisfaction as well as relationship between life satisfaction and life values was reported in regard to mean life satisfaction, computed by adding the score of all LiSat-9 items and dividing it by nine. While searching for predictors of life satisfaction, a

mean score of all nine items is a more reliable (reproducible) variable than a single item measure (life as a whole).¹ Relationships between life satisfaction and life values were analyzed using Spearman's rank correlation coefficient. Multiple regression was used in order to find out what other demographic and life situation variables might explain potential differences in life satisfaction across the three Asian countries.

Participants

All together 237 people with SCI living in three Asian countries: India ($n = 79$), Vietnam ($n = 92$), and Sri Lanka ($n = 66$) participated in this survey. Mean intra-country age ranged from 36 to 46 years. Most of study participants were male (70–80%), their mean intra-country age at the time of injury varied from 31 to 37 years, and mean intra-country time since injury ranged from 4 to 9 years. With regard to all basic demographic variables, except for gender, statistical differences existed among participants from three Asian countries. The majority of study participants (56–62%) were married or lived with a partner. All participants used a manual wheelchair for everyday activities. Most common type of wheelchair used was a non-customized orthopedic wheelchair (53–59%), except for India where an active lightweight, customized wheelchair was most commonly used (54%). The majority of participants (65–76%) reported paraplegia mainly as a result of road traffic accident (33–52%). Combined vocational activity (employment and self-employment) after SCI was different in participating countries: 50.6% in India, 31.5% in Vietnam, and 18.2% in Sri Lanka. Secondary school education obtained more than one-third (37–67%) of study participants. Differences in demographic characteristics among the participating countries are presented in Table 2.

Results

Present life situation

Analysis of living conditions revealed that 53.2% of study participants in India had no regular income at all, and 7.6% had lower income in comparison to average monthly income in the country (\$63).¹⁶ In Vietnam 67.4% had no income, and 16.3% people had lower income than average (\$85).¹⁷ However, In Sri Lanka 1.5% of participants did not have any regular income, and 66.7% had lower income in comparison to average (\$65).¹⁸ With regard to residential accommodation, similar percentage of study participants in Vietnam (66.3%) and Sri Lanka (66.7%) lived in houses not at all adapted to the needs of person using a wheelchair. In India 25.3% of people with SCI assessed

their houses as not at all adapted to their needs. Ability to get to the nearest rehabilitation center from participants' places of living, by available means of transport, varied among countries. In India, it was on average 4.29 hours, in Vietnam 2.77 hours, and in Sri Lanka 3.02 hours. Access to the rehabilitation center is important in light of prevention and management of post-SCI medical complications. Considering all investigated post-SCI medical complications within the 6 months prior the study, i.e. pressure sores, urinary tract infections, constipation, or diarrhea, and pulled joints significant differences existed among the three Asian countries (Table 2).

Life satisfaction

Cronbach's alpha reliability coefficients for the LiSat-9 was acceptable ($\alpha = 0.803$) for 237 study participants. Analysis of life satisfaction as a whole item as well as particular life domains showed significant differences among study participants, apart from two areas of life, i.e. leisure and vocational situation (Table 3). The differences in general life satisfaction among the three Asian countries were significant (Chi-square = 9.291, $P < 0.01$). *Post hoc* analysis revealed that people with SCI in Vietnam had significantly higher general life satisfaction than participants in India and Sri Lanka. There was no significant difference in general life satisfaction between people with SCI living in India and Sri Lanka. With regard to particular life domains, people in Vietnam scored significantly higher than people in Sri Lanka on five items (Nos 2, 6, 7, 8, 9).

Division of the variables into satisfied (scale grades 6 and 5) versus not satisfied (scale grades 1–4) revealed that the most satisfying areas of life were relations with friends, family, and partners. Financial situation and sexual life were assessed least satisfying areas of life (Fig. 1).

Life values

Factor analysis showed that CVS has three dimensions for people with SCI ($n = 237$), and is reliable measure for this population. The first dimension labeled as "Traditional" values (CVS-1) created 23 items (Cronbach $\alpha = 0.935$) such as: protecting your "face", chastity in women, and loyalty to superiors. The second dimension named "Universal" values (CVS-2) formed seven items (Cronbach $\alpha = 0.780$) such as: a close, intimate friend, patriotism, and knowledge (education). The third dimension called "Personal" values (CVS-3) consisted of three items (Cronbach $\alpha = 0.760$) such as: adaptability, persistence, and patience. Remaining eight items did not load sufficiently any of

Table 2 Demographic and injury characteristics in people with SCI living in three Asian countries

Demographic and injury characteristics	India (n = 79)		Vietnam (n = 92)		Sri Lanka (n = 66)		P value
	Mean (standard deviation)						
Study age (years)	35.6 ^c	(12.4)	38.6 ^c	(12.4)	45.5 ^{a,b}	(12.9)	0.001**
Age at injury (years)	31.3 ^c	(11.8)	31.6 ^c	(13.4)	36.8 ^{a,b}	(14.1)	0.020*
Time since injury (years)	4.3 ^c	(3.8)	7.0	(9.1)	8.7 ^a	(9.3)	0.003**
Distance/rehab center (hours)	4.3	(12.5)	2.77	(6.2)	3.0	(2.2)	0.461
	Frequency (percent)						
Gender							0.385
Male	63	(79.7)	65	(70.7)	51	(77.3)	
Female	16	(20.3)	27	(29.3)	15	(22.7)	
Marital status							0.503
Married/with partner	44	(55.7)	54	(58.7)	43	(65.2)	
Not married	35	(44.3)	38	(41.3)	23	(34.8)	
SCI level							0.344
Paraplegia	51	(64.6)	64	(69.6)	50	(75.8)	
Tetraplegia	28	(35.4)	28	(30.4)	16	(24.2)	
Cause of spinal cord lesion							0.029*
Road traffic injury	41	(51.9)	30	(32.6)	24	(36.4)	
Other etiology	38	(48.1)	62	(67.4)	42	(63.6)	
Post-SCI complications [†]							
Pressure sores	32	(40.5)	57	(62.0)	43	(65.2)	0.004**
Urinary tract infection	29	(36.7)	27	(29.3)	53	(80.3)	0.001**
Constipation or diarrhea	31	(39.2)	80	(87.0)	17	(25.8)	0.001**
Pulled joints	3	(3.8)	16	(17.4)	7	(10.6)	0.018*
Type of wheelchair							0.001**
Orthopedic	34	(43.0)	54	(58.7)	35	(53.0)	
Active lightweight	43	(54.4)	8	(8.7)	29	(43.9)	
Other	2	(2.5)	30	(32.6) [‡]	2	(3.0)	
Vocational activity							0.001**
Student	7	(8.9)	3	(3.3)	—	—	
Employed	23	(29.1)	13	(14.1)	5	(7.6)	
Self-employed	17	(21.5)	16	(17.4)	7	(10.6)	
Homemakers/parents	6	(7.6)	8	(8.7)	9	(13.6)	
Unemployed	26	(32.9)	52	(56.5)	45	(68.2)	
Income [§]							0.001**
Higher	30	(38.0)	12	(13.0)	8	(12.1)	
Similar	6	(7.6)	3	(3.3)	13	(19.7)	
Lower	6	(7.6)	15	(16.3)	44	(66.7)	
Not applicable	37	(46.8)	62	(67.4)	1	(1.5)	
Education							0.001**
No formal education	2	(2.5)	2	(2.2)	1	(1.5)	
Primary education	8	(10.1)	11	(12.0)	18	(27.3)	
Secondary	29	(36.7)	62	(67.4)	34	(51.5)	
College	14	(17.7)	4	(4.3)	12	(18.2)	
University/higher degree	26	(32.9)	11	(14.1)	1	(1.5)	
Accommodation							0.001**
Fully adapted	9	(11.4)	13	(14.1)	4	(6.1)	
Access in/out of the house	50	(63.3)	18	(19.6)	18	(27.3)	
Not at all adapted	20	(25.3)	61	(66.3)	44	(66.7)	

** $P < 0.01$, * $P < 0.05$, ^asignificantly different from India, ^bsignificantly different from Vietnam, ^csignificantly different from Sri Lanka.

[†]Yes within six months prior the study.

[‡]Nine people (9.8%) were using 'RoughRider' wheelchair produced in Vietnam.

[§]In comparison to average income in the country.

identified dimensions. With regard to the three dimensions of life values significant differences among three participating countries were identified in all domains (Table 4).

Post hoc analysis showed that on "Traditional" values people with SCI in India scored significantly higher than participants from Vietnam and Sri Lanka (and participants from Vietnam scored significantly higher than

those from Sri Lanka). On "Universal" and "Personal" values people with SCI in Vietnam scored significantly higher than people with SCI from Sri Lanka and India. In addition, participants from Sri Lanka scored significantly higher on "Universal" values than people from India. Differences on "Personal" values between participants from India and Sri Lanka were not significant.

Table 3 Life satisfaction in people with SCI living in three Asian countries

LiSat-9 domains	India (n = 79)		Vietnam (n = 92)		Sri Lanka (n = 66)		Kruskal–Wallis H
	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	
1. Life as a whole	3.67	1.06	3.18	1.55	3.76	0.80	9.419**
2. Self-care ability	2.34	1.01	3.44	1.59	3.12	1.30	24.072**
3. Leisure situation	2.56	1.04	3.03	1.58	3.00	1.10	5.224
4. Vocational situation	2.49	1.28	2.77	1.67	2.27	1.21	2.082
5. Financial situation	2.06	1.08	2.63	1.45	2.17	1.19	6.535*
6. Sexual life	1.99	1.04	2.75	1.61	1.78	1.03	12.253**
7. Partnership relations	4.20	1.40	4.18	1.66	3.53	1.00	16.424**
8. Family life	4.04	1.22	4.40	1.32	3.80	0.97	13.770**
9. Contacts with friends	4.58	1.41	4.70	1.19	4.17	0.93	16.460**
Mean life satisfaction	3.08	0.51	3.46	1.01	3.07	0.82	9.291*

* $P < 0.05$, ** $P < 0.01$.

Figure 1 Percent of study participants satisfied from different life domains.

Relationship between life satisfaction and life values

There was no significant correlation between general life satisfaction and any of CVS dimensions for people with SCI in India, Vietnam, or Sri Lanka. The range of correlation coefficient varied from $r_s = -0.069$ to $r_s = 0.263$.

Other predictors of life satisfaction

All the statistically significant demographic and life situation variables were entered into the first step of a multiple regression equation predicting life satisfaction (Table 5). The four variables: vocational status ($\beta =$

0.26, $P < 0.01$), time since injury ($\beta = 0.19$, $P < 0.01$), accessibility of accommodation ($\beta = 0.20$, $P < 0.01$), and urinary tract infections ($\beta = 0.13$, $P < 0.05$) were significant predictors of life satisfaction ($R^2 = 0.23$, $F(4, 231) = 16.97$, $P < 0.01$). Inclusion of country variable ($\beta = 0.19$, $P < 0.01$) in the second step of the analysis produced a significant increment in explained variance of life satisfaction (R^2 change = 6.76, $P < 0.01$). The final model was also significant ($R^2 = 0.25$, $F(4, 231) = 18.82$, $P < 0.01$). One variable (urinary tract infections) was excluded from the model in the second step of analysis.

Discussion

The study results indicate significant differences in life satisfaction in people with SCI living in Vietnam, India, and Sri Lanka. People with SCI from Vietnam tended to have higher life satisfaction scores than participants from India or Sri Lanka. However, it should be emphasized that the whole model explained only 25% of the variance. The first step of regression analysis showed that four variables significantly predicted life satisfaction. Study participants who were employed, with more years since injury, living in accessible houses and without medical complications tended to have higher life satisfaction scores. Relationship between these variables (especially employment and secondary impairments) and life satisfaction following SCI have also been proven by other studies.^{1,6} In the second

Table 4 Life values in people with SCI living in three Asian countries

CVS values	India (n = 79)		Vietnam (n = 92)		Sri Lanka (n = 66)		Kruskal–Wallis H
	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	
Traditional	184.48 ^{b,c}	20.29	161.26 ^{a,c}	24.61	148.83 ^{a,b}	18.75	89.211**
Universal	40.39 ^{b,c}	9.74	50.12 ^{a,c}	8.54	46.67 ^{a,b}	5.42	49.990**
Personal	18.80 ^b	4.89	22.16 ^{a,c}	3.90	18.98 ^b	2.69	44.068**

** $P < 0.01$, ^asignificantly different from India, ^bsignificantly different from Vietnam, ^csignificantly different from Sri Lanka.

Table 5 Multiple regression analysis predicting life satisfaction in people with SCI living in three Asian countries

Predictor	R ²	β	F
Step 1	0.23		16.97**
Vocational status		0.26**	
Time since injury		0.19**	
Accessibility of accommodation		0.20**	
Urinary tract infection		0.13*	
Step 2	0.25		18.82**
Vocational status		0.27**	
Time since injury		0.21**	
Accessibility of accommodation		0.20**	
Country		0.19**	

* $P < 0.05$, ** $P < 0.01$.

step of the analysis the country variable was added, and this accounted for a significant fraction of the variance of life satisfaction (excluding the urinary tract infection).

Despite the statistically significant differences between countries and life satisfaction, the scores on LiSat-9 were fairly similar and consistent with the existing literature in this area. Several previous studies have demonstrated relatively high scores for satisfaction with life as a whole and social components of the LiSat-9, specifically satisfaction with partnership relations, family life, and friendships.^{2,5} However, people with SCI in both developed and developing countries consistently share relatively low life satisfaction in areas of vocational situation, and sexual life.^{1,8} Our data are in agreement with this generalization of the literature base.

Interestingly, in our study persons with SCI from Vietnam scored consistently higher on nearly all aspects of life satisfaction than those in India and Sri Lanka. However, Vietnamese also scored significantly lower in satisfaction with life as a whole item. The Vietnamese sample scored satisfaction with life as a whole lower than the mean of the subcategories, whereas people from India and Sri Lanka scored the category of life as a whole higher than the mean of the subcategories. Here appears to be a contradiction that may be worth exploring. The participants from Vietnam appear to have achieved excellent (relatively) success in rehabilitation because the specific dimensions of life satisfaction were rated rather high. However, they have not regained a sense of their lives as a whole is valuable. Thus, their perspective of rehabilitation success may be different from people with SCI living in other developing countries. Possible explanation is that there is a cultural difference between people with SCI in Vietnam compared to those in India and Sri Lanka regarding what makes for a high satisfaction with life as a whole. General life satisfaction scores do not always coincide with satisfaction in other areas.

According to Campbell *et al.*,¹⁹ this is due to life aspirations and assessment of their achievements. Diener *et al.*²⁰ and associates showed that people in western Asian cultures have very high aspirations and expectations. When they cannot meet expectations, they experience feelings of failure, which leads to lower overall life satisfaction. We can only speculate that the Vietnamese community, closer to the western Asian cultures, is characterized by a higher level of aspiration in life than a society of India and Sri Lanka and hence the low score of satisfaction with life as a whole. Further investigation in this area is warranted.

Satisfaction with self-care ability and sexual function are dependent in many ways on the level and completeness of SCI itself and the quality of rehabilitation that is available.^{21,22} However, satisfaction with vocational status and leisure opportunities are dependent on the environmental factors, i.e. availability of options for people with SCI in different countries. Limited opportunity for reintegration with the society following SCI, especially continuation of education, employment, or participation in leisure activities, could possibly have an effect on life satisfaction. Societal limitations faced by people with SCI around the world depend to a great extent to the physical and attitudinal accessibility of the environment and society as a whole. Societal attitudes are often based on cultural values of a society and in the case of SCI, what having a disability means in that particular culture.

Our study showed that the CVS has different dimensions for people with SCI than those described by other researchers.^{13–15} Study participants distinguished three dimensions of life values labeled as: “Traditional”, “Universal”, “Personal”, and there were significant differences in importance of life values among people with SCI living in India, Vietnam, and Sri Lanka. It is interesting then that values as measured by the CVS, were not significantly correlated with life satisfaction in these three Asian countries.

In cross-cultural psychology there is a dispute between supporters of the theoretical assumption that the quality of life depends on a specific culture (relativistic approach) and the universalist conception according to which the most important for quality of life is a degree of freedom from external control in any culture.^{23–26} In other words, this is a dispute about the importance of culture in shaping the quality of life. Regardless of the reasons cited by proponents of both paradigms, there is agreement on the fact that we can identify factors independent of the culture. These include, for example, personality factors (extraversion, neuroticism).

A simple measurement of the relationship between culture and quality of life may not be sufficient. Many modern scholars suggest the necessity for cross-cultural issues of integration of cultural measurement (values norms) and individual (personality traits) because only their common effects, interactions and relationships are important for the general welfare.^{27,28} According to Contextual Model of Health-Related Quality of Life the sense of quality of life consists not only of cultural but also of demographic, social-ecological, and health-care contexts.²⁹ In spite of the differences in culturally and demographic characteristics, India and Sri Lanka share many similarities in their formal health-care systems which may affect the smaller differences in assessment of life satisfaction between the study participants of both countries and explain the larger differences with participants from Vietnam.³⁰

Several limitations of the current study should be mentioned. First, the data were obtained exclusively through self-report, which is subject to bias and distortion. Second, due to the cross-sectional nature of the data, no causal inferences can be made regarding the relationships documented in this report. Third, the interpretation of the current findings for SCI population is limited by the lack of comparable data based on general population samples. Fourth, the study might under-represent the poorest people with SCI living in remote rural areas not covered by any medical or social support in participating countries. Fifth, the samples from the three countries have some dissimilarity making direct comparisons difficult. Persons from Sri Lanka were older at the time of injury and had been injured longer than those from India and Vietnam. Indians had shorter duration of disability, were more likely to be living in a home that is wheelchair accessible, had a longer distance to travel to the nearest SCI center, yet had fewer pressure ulcers than those in Vietnam or Sri Lanka. However, all study participants in India were previous patients of the best in the country Indian Spinal Injuries Centre in New Delhi that provide not only a treatment and rehabilitation but also patient's education on post-SCI medical complications. Potential influence of these differences on life satisfaction following SCI deserves further investigation.

Conclusion

Our results suggest that there are between-country differences in life satisfaction after SCI. Identified differences in vocational status, time since injury, accessibility of accommodation, and urinary tract infections in three investigated Asian countries accounted for a significant but relatively small fraction of the between-country variability

in life satisfaction. While life values differed between countries, life values did not correlate with life satisfaction.

Future research in this area should include control population group matching with age and gender as well as take into account type of support for people with SCI available in Asian countries (governmental versus family support). The importance of environmental factors, especially life opportunity for people with SCI (e.g. education, employment, and leisure), should be also considered within future studies on life satisfaction in people with SCI living in less resourced developing countries.

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