ORIGINAL ARTICLE

Trajectories in the Course of Life Satisfaction After Spinal Cord Injury: Identification and Predictors

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ABSTRACT. van Leeuwen CM, Post MW, Hoekstra T, van der Woude LH, de Groot S, Snoek GJ, Mulder DG, Lindeman E. Trajectories in the course of life satisfaction after spinal cord injury: identification and predictors. Arch Phys Med Rehabil 2011;92:207-213.

Objective: To identify different life satisfaction trajectories in the period between the start of active spinal cord injury (SCI) rehabilitation and 5 years after discharge, and to find predictors for distinguishing between trajectories. The hypotheses were that different life satisfaction trajectories would be identified and that demographic, lesion, physical, and social characteristics would be predictors of life satisfaction trajectory membership.

Design: Multicenter prospective cohort study with measurements at the start of active rehabilitation, after 3 months, at discharge, and 1, 2, and 5 years after discharge.

Setting: Eight Dutch rehabilitation centers with specialized SCI units.

Participants: Persons (N=225) with recently acquired SCI between the ages of 18 and 65 years were included, and data from 206 persons were analyzed.

Interventions: Not applicable.

Main Outcome Measures: Life satisfaction was measured as the sum score of "current life satisfaction" and "current life satisfaction compared with life satisfaction before SCI" (range, 2–13).

Results: Five life satisfaction trajectories were identified by using latent class growth mixture modeling: (1) low median scores (3–5) at all time points (27%), (2) intermediate scores (6–7) at all time points (31%), (3) high scores (8–10.5) at all time points (17%), (4) improvements from 3 to 9 (23%), and (5) deterioration from 9 to 4 (2%). Logistic regression showed that predictors of the low versus high life satisfaction trajectory were functional independence and pain. Predictors of the low life satisfaction versus the recovery trajectory were sex and functional independence. These predictors explained only a small part of the total variance.

Conclusions: Life satisfaction in people with SCI follows distinct trajectories. Monitoring life satisfaction at the start of active rehabilitation and 3 months later might allow identification of persons at risk for poor long-term adjustment.

Key Words: Longitudinal studies; Quality of life; Personal satisfaction; Rehabilitation; Spinal cord injuries.

HOW DO PEOPLE with SCI adapt to the loss of bodily functions, the insecurities about future prospects, and the difficulties to reach important life goals? Several studies[1-4] show that after an initial downturn, mean life satisfaction scores improve over time. Predictors consistently associated with increased life satisfaction include higher education,[4-9] increased mobility,[4,5,10] better perceived physical health,[5-7,10-15] better social support system,[4-7,9-12,16-18] and better psychological functioning.[6,12,15,19-21] Although life satisfaction is studied widely in persons with SCI,[1-21] most studies are cross-sectional and study life satisfaction at group level.

However, clinical experience is that improvements in life satisfaction do not necessarily occur in all persons with SCI. Moreover, while life satisfaction recovers in an early stage after SCI in some persons, it takes considerable time to recover in other persons. Therefore, although it is useful to obtain insight in the overall recovery of life satisfaction after an SCI, this may conceal distinct trajectories of life satisfaction. Insight in these trajectories offers opportunities to understand how persons differ in their adaptation to an SCI, and to find possible risk factors for persistent low levels of life satisfaction.[22,23] Clinical practice can benefit from this knowledge, because it helps identifying persons at risk for poor long-term adjustment in an early stage after SCI.

To our knowledge, there have only been 3 attempts to empirically identify trajectories of life satisfaction after SCI.[2,24,25] A study[24] of 17 individuals revealed 4 profiles in the course of life satisfaction between 6 months and 5 years after SCI. However, this small number of respondents does not allow for generalization of the results. Second, a longitudinal study[25] between 1 year and 5 years after SCI with 207 persons found a consistently high life satisfaction pattern, a pattern with a consistent decrease, and one with a consistent increase. However, the number of persons per pattern was not given.

List of Abbreviations

AIS	American Spinal Injury Association Impairment Scale
BIC	Bayesian Information Criterion
BLRT	Bootstrapped Likelihood Ratio Test
SCI	spinal cord injury

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Table 1: Descriptive Characteristics at the Start of Active Rehabilitation of Participants and Nonparticipants 5 Years After Discharge (N=206)

Characteristics	Participants (n=131)	Nonparticipants (n=75)	*P*
Sex (male)	94 (71.8)	59 (78.7)	.275
Marital status (together)	97 (74.0)	57 (76.0)	.756
Children (yes)	65 (49.6)	43 (57.3)	.286
Education			
Low	40 (30.5)	28 (37.3)	.514
Middle	66 (50.4)	35 (46.7)	
High	25 (19.1)	11 (14.7)	
Unknown		1 (1.3)	
Age (y)	38.5 (26.2–52.1)	44.7 (32.4–56.9)	.011*
Type of injury			
Incomplete paraplegia	24 (18.3)	15 (20.0)	.806
Complete paraplegia	61 (46.5)	30 (40.0)	
Incomplete tetraplegia	15 (11.5)	11 (14.7)	
Complete tetraplegia	31 (23.7)	19 (25.3)	
Cause of injury (traumatic)	104 (79.4)	50 (66.7)	.043*
Life satisfaction (range, 2-13)	5.0 (3.0–7.0)	5.0 (3.0–6.0)	.064
Functional independence (range, 13-91)	37.0 (29.5–49.5)	36.0 (25.0–56.5)	.935
Secondary impairments (range, 0-7)	1.0 (0.0–2.0)	1.0 (1.0–2.0)	.104
Pain (range, 0-110)	12.0 (7.0–18.0)	14.5 (8.0–22.0)	.250
Total social support (range, 12-48)	35 (29–39)	36 (32–40)	.093
Everyday social support (range, 4-16)	12 (10–13)	13 (11–14)	.002*
Support in problem situations (range, 4-16)	12 (10–14)	12 (10–14)	.728
Esteem support (range, 4-16)	11 (9–13)	11 (9.5–13)	.236

NOTE. Values are n (%), median (interquartile range), or as otherwise indicated.
*$P < 0.05$.

Third, a Dutch prospective cohort study[2] in which 225 persons with SCI were followed up between the start of active rehabilitation and 1 year after discharge, showed that 28 persons were consistently satisfied, 43 persons consistently dissatisfied, and 67 shifted between both conditions. The present study is a sequel to this cohort study and expands on this in 2 ways. First, a longer follow-up period is evaluated, and second, a contemporary statistical method, latent class growth mixture modeling,[26,27] is used to unravel possible trajectories in life satisfaction over time.

The aim of this study was to identify distinct life satisfaction trajectories in the period between the start of active SCI rehabilitation and 5 years after discharge, and to find predictors for distinguishing between trajectories. We hypothesized that different life satisfaction trajectories would be identified and that demographic, lesion, physical, and social characteristics would be predictors of life satisfaction trajectory membership.

METHODS

Participants

This study is a follow-up of the Dutch research program "Physical Strain, Work Capacity, and Mechanisms of Restoration of Mobility in the Rehabilitation of Persons With Spinal Cord Injuries."[28] Subjects were admitted to inpatient rehabilitation in 1 of the 8 Dutch rehabilitation centers specialized in SCI rehabilitation. Inclusion criteria were: (1) a recently acquired SCI; (2) age between 18 and 65 years; (3) grade A, B, C, or D on the AIS; and (4) expected permanent wheelchair dependency. Participants were excluded if they had (1) an SCI caused by a malignant tumor; (2) a progressive disease; (3) psychiatric problems; or (4) insufficient command of the Dutch language to understand the goal of the study and test instructions. The research protocol was approved by the Medical Ethics Committee of the Rehabilitation Limburg/Institute for Rehabilitation Research. All persons gave written informed consent.

Procedure

A total of 6 measurements were performed at the start of active rehabilitation (defined as the moment that a person could sit for 3–4h, which was required to perform the physical tests that were part of this measurement), 3 months after the start of active rehabilitation, at discharge from inpatient rehabilitation, and 1, 2, and 5 years after discharge. The measurements for the present study comprised a medical examination, an oral interview with a trained research assistant, and a self-report questionnaire.

Instruments

Life satisfaction was operationalized as satisfaction with overall quality of life and measured with 2 questions. The first question was: "People can be more or less satisfied with their life as a whole, their so-called quality of life. What is your quality of life at the moment (range: 1, very unsatisfying; 6, very satisfying)?" The second question was: "If you compare your life now with your life before the SCI, is your quality of life at the moment worse, equal, or better than before the SCI (range: 1, much worse; 7, much better)?" Supported by strong[29] correlations (0.5–0.6) between both questions at each measurement, a total life satisfaction score was computed by summing up the 2 scores (range, 2–13). This total score was normally distributed (skewness, 0.0–0.3) at each measurement, was strongly[29] correlated (.68–.72) with the global life satisfaction item of the Lisat-9[30] at the measurements after discharge of this study (M.W.P., unpublished data, July 2010) and was used in several earlier publications.[2,17]