

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

Christel M. van Leeuwen, MSc, Marcel W. Post, PhD, Trynke Hoekstra, MSc, Lucas H. van der Woude, PhD, Sonja de Groot, PhD, Govert J. Snoek, PhD, Dineke G. Mulder, MD, Eline Lindeman, PhD

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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.

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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 studies¹⁻⁴ 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 study²⁴ 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 study²⁵ 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.

From the Rudolf Magnus Institute of Neuroscience and Center of Excellence for Rehabilitation Medicine, University Medical Center Utrecht and Rehabilitation Center De Hoogstraat, Utrecht (van Leeuwen, Post, Lindeman); Department of Health Sciences, Faculty of Earth and Life Sciences, VU University Amsterdam, Amsterdam (Hoekstra); Center for Human Movement Sciences, University Medical Center Groningen, University of Groningen, Groningen (van der Woude, de Groot, Mulder); Rehabilitation Center Amsterdam, Amsterdam (de Groot); and Rehabilitation Center Het Roessingh, Enschede, The Netherlands (Snoek).

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Correspondence to Marcel W. Post, PhD, Rehabilitation Center De Hoogstraat, Rembrandtkade 10, 3583 TM, Utrecht, The Netherlands, e-mail: m.post@dehoogstraat.nl. Reprints are not available from the author.

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List of Abbreviations

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

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 study² 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 strong²⁹ 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 strongly²⁹ correlated (.68–.72) with the global life satisfaction item of the Lisat-9³⁰ at the measurements after discharge of this study (M.W.P., unpublished data, July 2010) and was used in several earlier publications.^{2,17}

Table 2: Criteria for Selecting the Number of Trajectories

No. of Trajectories	BIC	BLRT (<i>P</i>)
k=1	4209.47	NA
k=2	3923.96	<.001
k=3	3844.54	<.001
k=4	3837.65	<.001
k=5	3812.33	.013
k=6	3823.32	.333

Abbreviation: NA, not applicable.

Lesion characteristics were assessed according to the International Standards for Neurological Classification of Spinal Cord Injury.³¹ Neurologic levels below T1 were defined as paraplegia, and neurologic levels at or above T1 were defined as tetraplegia. AIS grades A and B were considered motor complete, and grades C and D were considered motor incomplete. Cause of injury was dichotomized in traumatic versus nontraumatic.

Functional independence was measured with the motor score of the FIM, consisting of 13 items about self-care, mobility, transfers, and toileting. The FIM motor score is a responsive measure in persons with SCI.³² A high score refers to a high level of functional independence.

Secondary impairments were split into 2 categories:

1. *Pain*: Thirteen locations were assessed to measure the severity of pain in muscles and joints, specifically the upper limbs, lower limbs, back, and neck. For each location a 5-point severity scale was scored, ranging from “no pain” to “very severe pain.” To measure the severity of abnormal pain sensations, 9 characteristics (such as numbness, itching, and tingling) were assessed. Again, a 5-point severity scale was scored for each characteristic. A total pain score was calculated by summing up the total score for severity of pain in muscles and joints, and the total score for severity of abnormal pain sensations. A logarithmic transformation was applied to the total pain score because of its skewed distribution.

2. *Other secondary impairments*: The presence of 7 secondary impairments, which were pressure ulcers, urinary tract infections, pulmonary infections, neurogenic heterotopic ossification, edema, hypotension, and autonomic dysreflexia, was reported as “absent” or “present.” A total sum score was computed by adding up the 7 individual scores.

Social support was measured with the Social Support List-12, which is a reliable and valid short version of the Social Support List-Interactions, consisting of 12 items on 3 scales: “everyday social support,” “support in problem situations,” and “esteem support.”³³ Possible item scores range from 1 (seldom or never) to 4 (very often).

Demographic characteristics included were age, sex, educational level (low, middle, high), marital status (living to-

gether vs living alone), and children (yes, no). All were measured at the start of active rehabilitation.

Statistical Analyses

Only persons who completed at least 2 measurement occasions were included in the analyses. A nonresponse analysis was performed by comparing data at the start of active rehabilitation between persons who completed the measurement 5 years after discharge with persons who did not, using chi-square tests and *t* tests.

Different trajectories in life satisfaction were determined by fitting a latent class growth mixture model to the data, using Mplus software.^{26a} Latent class growth models are based on regression and structural equation models.²⁷ The underlying aim is to capture heterogeneity in the course of life satisfaction in an optimal (*k*) number of classes, each with a unique trajectory.²⁷ Each subgroup has its own growth parameters (ie, intercept, slope). The optimal model is a model where individuals within a subgroup are most similar to each other and most different to individuals in other subgroups. To determine the optimal number of trajectories the BIC and the BLRT were used. Lower values of the BIC and a significant *P* value of the BLRT indicate a better model fit.³⁴ Participants were assigned to the trajectory to which they had the highest probability of belonging to, by the use of posterior probabilities.²⁶ Once participants were assigned to a trajectory, logistic regression models were applied to determine which predictors could discriminate between the trajectories that were most distinct. Bivariate logistic regression analyses were conducted to determine which predictors should be entered in the multivariate logistic regression analyses by using the selection criterion of a *P* value less than .10. All selected predictors were simultaneously entered using the backward elimination method, leading to a final multivariate logistic regression model including only significant predictors. SPSS statistical program for Windows (version 16.0)^b was used for the regression analyses.

RESULTS

Respondent Characteristics

At the start of active rehabilitation, 225 persons with SCI were included in the study. One hundred fifty-five persons participated 3 months after the start of active rehabilitation, 198 at discharge, 156 at one year, 99 two years, and 131 persons participated 5 years after discharge. The lower number of participants in the second measurement occurred because for participants who had a short inpatient rehabilitation, this measurement was replaced by the measurement at discharge. Because 2 centers did not participate 2 years after discharge, a lower number of participants appeared in this measurement. In addition, 30 persons died, 17 refused to collaborate, 5 moved, 10 could not be contacted, and the rest had other reasons for

Table 3: The 5 Trajectories, Their Posterior Probabilities, and Life Satisfaction Scores

Trajectories	N (%)	Mean Posterior Probabilities	Start	3mo After	Discharge	1y After	2y After	5y After
Low life satisfaction	56 (27.2)	.81	3 (3–5)	4 (3–5)	4 (3–5)	4 (3–5)	4 (3–5)	5 (4–6)
High life satisfaction	34 (16.5)	.85	8 (8–9.5)	9 (8–11)	9 (9–11)	9 (8.8–10)	9 (9–10)	10.5 (9–12)
Recovery	48 (23.3)	.80	3 (3–4)	6 (4–7.8)	6.5 (5–7)	7 (6–8)	7 (6.5–9)	9 (7–9)
Deterioration	5 (2.4)	.88	9 (7–10.5)	6 (5–6)	6.5 (3–7.8)	6 (3.5–7)	5 (3.5–6.5)	4 (2.5–6.5)
Intermediate life satisfaction	63 (30.6)	.71	6 (6–7)	6.5 (5–7)	7 (6–8)	7 (6–8)	7 (6–7)	7 (7–8)

NOTE. Values are median (interquartile range) or as otherwise indicated.

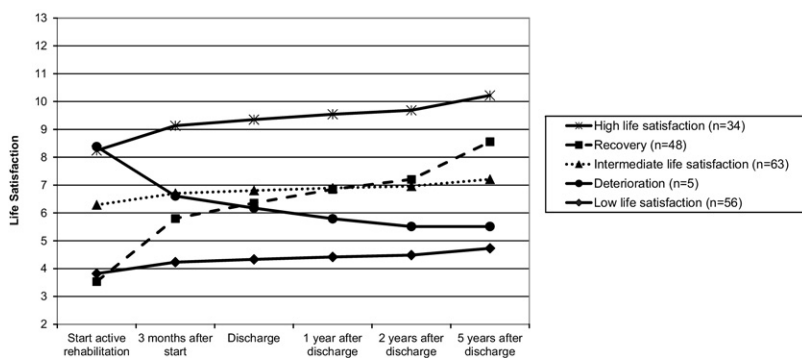


Fig 1. Five estimated trajectories in life satisfaction between the start of active rehabilitation and 5 years after discharge from inpatient rehabilitation (N=206).

dropping out of the study. A total of 206 persons completed at least 2 measurements and were included in the analyses. Participants' characteristics are displayed in table 1. A comparison between participants and nonparticipants 5 years after discharge showed no differences between both groups except that nonparticipants had a higher proportion of nontraumatic injuries, had lower everyday social support, and were older than participants (see table 1). The median time between the onset of SCI and the start of active rehabilitation was 75 days (interquartile range, 52–115d).

Identifying Life Satisfaction Trajectories

Table 2 shows that a model with 5 life satisfaction trajectories best represented the data (ie, having the lowest BIC num-

ber and a significant *P* value of BLRT). The first trajectory showed low levels of life satisfaction at all time points. The second trajectory revealed initial high levels of life satisfaction with slight increments over time. The third trajectory revealed steady improvements over time with low life satisfaction scores at the beginning and high life satisfaction scores at the end. In contrast, the fourth trajectory, which had the fewest people, showed high life satisfaction scores at the beginning and steep declines over time. The fifth trajectory was somewhat less distinctive and consisted of persons with fluctuating life satisfaction levels at different time points. Because higher and lower levels of life satisfaction between individuals balanced each other, this intermediate trajectory showed a stable line over time (table 3, fig 1).

Table 4: Characteristics Per Life Satisfaction Trajectory (N=206)

	Low (n=56)	High (n=34)	Recovery (n=48)	Deterioration (n=5)	Intermediate (n=63)
Demographics					
Male	45 (29.4)	31 (20.3)	31 (20.3)	4 (2.6)	42 (27.5)
Female	11 (20.8)	3 (5.7)	17 (32.1)	1 (1.9)	21 (39.6)
Living together	46 (29.9)	26 (16.9)	36 (23.4)	2 (1.3)	44 (28.6)
Living alone	10 (19.2)	8 (15.4)	12 (23.1)	3 (5.8)	19 (36.5)
Children	31 (28.7)	15 (13.9)	28 (25.9)	2 (1.9)	32 (29.6)
No children	25 (25.5)	19 (19.4)	20 (20.4)	3 (3.1)	31 (31.6)
Education Low	16 (23.5)	8 (11.8)	17 (25.0)	1 (1.5)	26 (38.2)
Education Middle	26 (25.7)	24 (23.8)	22 (21.8)	4 (4.0)	25 (24.8)
Education High	13 (36.1)	2 (5.6)	9 (25.0)	0 (0.0)	12 (33.3)
Age (y)	40.5 (31.0–55.4)	31.0 (20.9–50.3)	44.0 (29.8–57.9)	41.4 (31.4–47.6)	41.6 (25.9–53.2)
Lesion Characteristics					
Paraplegia	29 (22.3)	26 (20.0)	28 (21.5)	5 (3.9)	42 (32.3)
Tetraplegia	27 (35.5)	8 (10.5)	20 (26.3)	0 (0.0)	21 (27.6)
Complete	41 (29.1)	25 (17.7)	30 (21.3)	3 (2.1)	42 (29.8)
Incomplete	15 (23.1)	9 (13.8)	18 (27.7)	2 (3.1)	21 (32.3)
Traumatic injury	42 (27.3)	26 (16.9)	36 (23.4)	4 (2.6)	46 (29.9)
Nontraumatic injury	14 (26.9)	8 (15.4)	12 (23.1)	1 (1.9)	17 (32.7)
Physical Factors					
Functional independence	33 (19.5–38)	46 (34.5–71)	36 (30–45.8)	50 (38–51.5)	37.5 (29.8–62.3)
Pain	16 (9–23.8)	8 (4–15.5)	14 (9–21.5)	8 (5–18.5)	12 (8–19)
Secondary impairments	2 (1–2.8)	1 (1–2)	1 (0–2)	1 (0.5–2)	1 (0–2)
Social Factors					
Total social support	35.0 (31.3–38.8)	36 (32–39.5)	35.5 (31–38)	39 (31–45)	36 (30–41)
Everyday social support	12 (10.3–13)	13 (12–14)	12 (11–13)	15 (11.5–15.5)	12 (10–13.3)
Support in problem situations	12 (10.2–14)	12 (9.5–15)	11 (10–13)	13 (9–16)	13 (9–14)
Esteem support	11 (9–13)	12 (9.5–13)	11 (9–12)	12 (10–13.5)	11 (10–13)

NOTE. Values are n (% of total sample) or median (interquartile range). All variables were measured at the start of active rehabilitation.

Table 5: Bivariate Logistic Regression Analyses to Distinguish Between the Low Life Satisfaction Versus High Life Satisfaction Trajectory (N=90) and the Low Life Satisfaction Versus the Recovery Trajectory (N=104)

Variables	Low Life Satisfaction vs High Life Satisfaction (N=90)		Low Life Satisfaction vs Recovery (N=104)	
	Odds Ratio	95% CI	Odds Ratio	95% CI
Demographics				
Sex (male)	2.53	0.65–9.80	0.45	0.18–1.08*
Age (higher)	0.97	0.94–1.00*	1.01	0.98–1.04
Children (yes)	0.59	0.25–1.42	1.13	0.52–2.46
Marital status (together)	0.81	0.27–2.38	0.65	0.25–1.68
Education (low-middle)	2.11	0.74–6.01	0.80	0.33–1.94
Education (low-high)	0.35	0.06–1.99	0.65	0.22–1.94
Lesion Characteristics				
Lesion level (paraplegia)	3.03	1.17–7.83*	1.30	0.60–2.84
Completeness (complete)	1.11	0.41–3.01	0.57	0.25–1.32
Cause of injury (traumatic)	1.04	0.38–2.83	1.00	0.41–2.44
Physical Variables				
Functional independence (higher)	1.05	1.03–1.08*	1.03	1.00–1.06*
Pain (higher)	0.33	0.17–0.64*	0.86	0.52–1.42
Secondary impairments (higher)	0.83	0.60–1.17	0.77	0.57–1.04*
Social Variables				
Total social support (higher)	1.05	0.97–1.14	0.99	0.92–1.05
Everyday social support (higher)	1.27	0.99–1.63*	1.13	0.91–1.39
Support in problem situations (higher)	0.99	0.84–1.18	0.91	0.78–1.05
Esteem support (higher)	1.11	0.92–1.35	0.97	0.83–1.12

Abbreviation: CI, confidence interval.

* $P < .10$.

Predictors of Life Satisfaction Trajectory Membership

Demographic, lesion, physical, and social characteristics per trajectory are displayed in table 4. Three contrasts between the trajectories were interesting looking at the starting point of life satisfaction and changes of life satisfaction over time: low life satisfaction versus high life satisfaction; low life satisfaction versus recovery; and high life satisfaction versus deterioration.

It was not possible to statistically test for predictors between the high life satisfaction trajectory and the deterioration trajectory, because of the small number of persons in the deterioration trajectory.

Persons in the high life satisfaction trajectory, compared with persons in the low life satisfaction trajectory, were more likely to be younger and to have paraplegia, a higher functional independence, less pain, and more everyday social support at the start of active rehabilitation (table 5). Multivariate analysis found 2 predictors of high life satisfaction, higher functional independence and less pain, together explaining a small amount of variance of trajectory membership (table 6).

Persons in the recovery trajectory, compared with persons in the low life satisfaction trajectory, were more often female and were more likely to have a higher functional independence and fewer secondary impairments at the start of active rehabilitation (see table 5). Multivariate analysis found 2 predictors of recovery of initial low life satisfaction: female sex and higher functional status. Again, these 2 predictors explained a small amount of variance in trajectory membership (see table 6).

DISCUSSION

Our hypothesis that life satisfaction in a large cohort of persons with SCI follows distinct trajectories between the start of active rehabilitation and 5 years after discharge was confirmed. We found a low life satisfaction trajectory, a high life satisfaction trajectory, a recovery trajectory, a deterioration trajectory, and an

intermediate life satisfaction trajectory. The second hypothesis that demographic, lesion, physical, and social characteristics are predictors of life satisfaction trajectory membership was only partly confirmed. Functional independence and pain discriminated between the low and high life satisfaction trajectory, and sex and functional independence discriminated between the low life satisfaction and recovery trajectory.

Trajectories of Life Satisfaction

Part of the life satisfaction trajectories that we identified is similar to the trajectories recognized in 2 earlier studies.^{24,25} The study of Putzke et al²⁵ also identified a constantly high life satisfaction trajectory, a recovery trajectory, and a deterioration trajectory by using cluster analysis. The 2 other trajectories found in the present study were not identified.²⁵ However, it was not described why 3 clusters best represented the data.²⁵ Besides, latent class growth mixture modeling is a more flexible method to identify trajectories than cluster analysis.²⁷ All 4 life satisfaction trajectories (low, high, recovery, fluctuating) in the study by Stensman²⁴ were found in the present study. The fluctuating trajectory in Stensman's study was represented in our data by the intermediate life satisfaction trajectory. The present study integrates and expands on these results by showing that 5 life satisfaction trajectories can be distinguished. It is important to take into account that a trajectory represents the course of life satisfaction for a group of individuals. Therefore, the reported life satisfaction trajectories might appear smoother than they actually are for individuals.

Predictors of Life Satisfaction Trajectory Membership

Functional independence and pain severity discriminated between the low and high life satisfaction trajectories. Both were also determinants of the course of life satisfaction in our cohort of persons with SCI,² (C.M.v.L., unpublished data, July

Table 6: Backward Multivariate Logistic Regression Analyses to Distinguish Between the Low Life Satisfaction Versus High Life Satisfaction Trajectory (N=90) and the Low Life Satisfaction Versus the Recovery Trajectory (N=104)

Variables	Low Life Satisfaction vs High Life Satisfaction (N=90)		Low Life Satisfaction vs Recovery (N=104)	
	Odds Ratio	95% CI	Odds Ratio	95% CI
Functional independence (higher)	1.04	1.01–1.08*	1.03	1.01–1.06*
Pain (higher)	0.44	0.20–0.96*	NE	NE
Sex (male)	NE	NE	0.36	0.14–0.93*
Age (higher)	NS	NS	NE	NE
Lesion level (paraplegia)	NS	NS	NE	NE
Secondary impairments (higher)	NE	NE	NS	NS
Everyday social support (higher)	NS	NS	NE	NE
R ²	0.31		0.13	
Predicted percentage correct	76.20		63.70	

Abbreviations: CI, confidence interval; NE, Not entered; NS, Not significant.
* $P < .05$.

2010) and were found as predictors of life satisfaction in earlier studies.^{4,5,35} Furthermore, the present study showed that male sex and lower functional status were predictors of long-term poor life satisfaction. In 2 other studies,^{4,5} male sex was also a predictor of low life satisfaction after SCI. A possible explanation why persons in the low life satisfaction trajectory were more likely to have a lower functional independence than persons in the recovery trajectory is that slightly more persons had tetraplegia in the low life satisfaction trajectory than in the recovery trajectory. It was not expected that social support was not a predictor of life satisfaction trajectory membership, because social support has been associated with life satisfaction in other studies,^{4,7,9-12,16-18} and 2 earlier studies¹⁷ (C.M.v.L., unpublished data, July 2010) in the same cohort have stressed the importance of different types of social support for life satisfaction. A difference between the present study and these earlier studies is that social support was measured only once at the start of active rehabilitation. Social support levels were high for each trajectory in this early stage, which might explain why social support was not a predictor.

The core message, however, is that demographic, lesion, physical, and social characteristics at the start of rehabilitation cannot predict life satisfaction trajectories. Recent studies have shown that personal factors such as hope, positive affect, optimism, and self-efficacy can explain a significant amount of variance in life satisfaction.^{20,21} Personal factors were not assessed during inpatient rehabilitation in our cohort study. Further research is necessary to confirm the hypothesis that personal factors are predictors for life satisfaction trajectory membership.

Study Limitations

A limitation to the present study was that only Dutch persons with SCI between 18 and 65 years of age with expected permanent wheelchair dependency admitted to a rehabilitation center were included. This influenced the representativeness of the population and thereby the degree to which the results of our study can be generalized to the whole population of persons with SCI. Secondly, persons who were older, received less everyday social support, and had a nontraumatic injury had a higher chance of dropping out of the study. The dropout rate was low, however, and latent class growth mixture modeling allows the number of observations per person to vary.^{26,27} Thirdly, although psychometric properties of the life satisfaction score were satisfactory, this questionnaire is not commonly used to measure life satisfaction in people with SCI, which makes a comparison with other studies somewhat more difficult.

Clinical Implications

The 5 distinct trajectories give professionals insight into how persons differ in their adaptation to an SCI. The results further suggest that it might be sufficient to repeatedly administer only 2 life satisfaction questions at the start of active rehabilitation and 3 months after, to predict long-term life satisfaction and to identify persons who might be considered for psychological consultation.

Future Research

Our recommendation for further research is to investigate whether personal factors are predictors for distinguishing between life satisfaction trajectories. Possible factors to examine are hope, positive affect, optimism, and self-efficacy. Moreover, it would be interesting to investigate which psychological intervention is effective to protect people with SCI at risk for poor long-term adjustment.

CONCLUSIONS

The identification of 5 different life satisfaction trajectories improves our understanding of how persons differ in their adaptation to an SCI. Monitoring life satisfaction at the start of active rehabilitation and 3 months after might be a useful way to identify persons at risk for poor long-term adjustment.

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Suppliers

- a. Muthén & Muthén, 3463 Stoner Ave, Los Angeles, CA 90066.
- b. SPSS Inc, 233 S Wacker Dr, 11th Fl, Chicago, IL 60606.