

LIFE SATISFACTION OF PERSONS WITH SPINAL CORD INJURY COMPARED TO A POPULATION GROUP

Marcel W. M. Post PhD,¹ Alphons J. Van Dijk MD,² Floris W. A. Van Asbeck PhD, MD³, and August J. P. Schrijvers PhD¹

From the ¹Julius Centre for Patient Oriented Research, Utrecht University, Utrecht, ²Rehabilitation Centre "Het Roessingh", Enschede and ³Rehabilitation Centre "De Hoogstraat", Utrecht, The Netherlands

ABSTRACT. Life satisfaction is thought to be the subjective part of quality of life, i.e. the feelings of the persons concerned about their functioning and circumstances. In this study, life satisfaction of spinal cord-injured persons living in the community is compared to life satisfaction of a population group. Respondents were a nationwide sample of 318 persons with spinal cord injury (response 60%) and 507 inhabitants of a large city in The Netherlands (response 42%). Life satisfaction was measured using the Life Satisfaction Questionnaire, containing one question about general life satisfaction and eight questions about domain-specific life satisfaction. Mean scores of general life satisfaction and of satisfaction with self-care ability, leisure situation, vocational situation and sexual life were lower in persons with spinal cord injury than in the population group, but satisfaction with family life was higher. However, differences in general life satisfaction, satisfaction with leisure situation and with vocational situation could be attributed to differences in the composition of both groups. Satisfaction with self-care ability was lower in persons with tetraplegia than in persons with paraplegia, but we found no differences in other questions. Several relationships between life satisfaction and age and marital status existed, but they were more pronounced in the population group than in the group of persons with spinal cord injury. Time after injury and cause of injury were not related to life satisfaction variables. Uniformity in measurement instruments would facilitate comparisons between studies.

Key words: happiness, life satisfaction, quality of life, spinal cord injuries.

INTRODUCTION

Rehabilitation mobilizes the resources of individuals with

impairments in order to secure their social well-being and life satisfaction (14, 32). Therefore, subjective well-being of rehabilitation recipients is a relevant subject in rehabilitation outcome research (16, 21, 42). Life satisfaction and self-rated adjustment were good predictors of survival 15 years after injury (25). Others, including health-care professionals, tend to underestimate the perceived quality of life of persons with a spinal cord injury (18). However, many definitions of life satisfaction exist and no clear relationships have been found to concepts like quality of life.

Life satisfaction and quality of life

Quality of life can be defined as the subjective evaluation of the satisfactory to good characteristics of a person's life (20, 23, 42). In that case, quality of life is almost synonymous with satisfaction with one's life (35). Fuhrer (17) uses the term "subjective quality of life as a whole", and equals it to subjective well-being.

McDowell & Newell (29) gave a broader definition of quality of life: "Both the adequacy of material circumstances and people's feelings about these circumstances". Such a "Personal assessment of one's condition compared to an external reference standard or to one's aspirations" may be called life satisfaction (29: p. 204). In rehabilitation medicine, Whiteneck (42) similarly distinguished in a comparable way the concept of "handicap" as the objective, observable component of quality of life, from the concept of "life satisfaction" as the subjective perceptions of the quality of one's own existence. Defining life satisfaction as an element of quality of life instead of equalizing it with quality of life appears to be an effective approach, because it is more specific and prevents confusion with other authors, who, for instance, equalize quality of life with psychological distress (40) or with health status (30).

Some authors made a conceptual distinction between general life satisfaction and domain-specific life satis-

faction. Veenhoven (38) called general life satisfaction “happiness”, to be divided (amongst others) into *hedonic level of affect*—the degree to which the various effects a person experiences (moods, feelings, emotions) are pleasant in character—and *contentment*—the degree to which an individual perceives that his aspirations are being met. Thus, contentment is thought to be a more rational evaluation. Fugl-Meyer et al. (14) used this distinction in a Life Satisfaction Questionnaire (LSQ) consisting of one question about general life satisfaction (happiness) and eight questions about domain-specific life satisfaction, or contentment in Veenhoven’s terminology. The LSQ was used in several rehabilitation groups, such as Stroke and Multiple Sclerosis (4, 5, 15, 27, 39).

Measurement of life satisfaction in spinal cord-injured (SCI) patients

Life satisfaction can be measured in three ways (42): (i) single item rating scales, (ii) multiple item rating scales focusing on general life satisfaction, and (iii) multiple item questionnaires including items about the satisfaction with certain aspects of life. In our review of the literature, we restricted ourselves to articles in which life satisfaction is measured, and to articles about quality of life, adjustment or related terms where these terms were operationalized as life satisfaction.

In SCI groups, several authors used a single-question measure of general life satisfaction or happiness (9, 11, 12, 18, 22, 35, 36). Siösteen et al. (35) used the question: “How would you rate your quality of life these days?” Respondents answered on a Visual Assessment Scale. Gerhart (18) used a similar question, but with four possible answers: excellent, good, fair, poor. Kinney & Coyle (22) used the Life 3 Scale, which score is obtained by asking respondents at two separate points in the interview: “How do you feel about your life in general?” (1 = “terrible” to 7 = “delighted”). Crewe & Krause (9) asked respondents to rate their current overall adjustment on a ten-point “ladder”. Cushman & Hasset (11) used a single rating in which subjects were asked to rate their current quality of life as compared to that of same-age peers on a five-point scale (“much better” to “much worse”).

We found only one multiple item rating scale that was used in SCI persons, the Life Satisfaction Index A—Amended (LSIA-A). This scale was originally developed for the elderly (1), but it was used for SCI persons by Schulz & Decker (34) and, following them, by Fuhrer et al. (16) and Crisp (10). It is a miscellaneous measure but, containing dimensions like “mood tone” and “zest for

life”, is probably best categorized as a measure of hedonic level of effect.

Questionnaires about domain-specific life satisfaction were more often used (7, 9, 16, 22, 31). Apart from the LSIA-A, Fuhrer et al. (16) used a series of 12 questions about satisfaction with life domains, but did not describe interrelations between both questionnaires. Finally, some authors used LSQs that contained both domain-specific and general questions (2, 3, 8). However, results are hardly comparable, due to the different questions and possible answers.

In summary, a review showed that research in SCI groups concentrated on single-item and domain-specific questionnaires. Only Bach & Tilton (2) made a direct, although uncontrolled, comparison with a population group, and Boschen (3) used an age-matched population group. In this study, we integrated data of an SCI and a population group together in one database to facilitate direct controlled comparisons.

MATERIAL & METHODS

Respondents

Spinal cord-injured group. This study included SCI individuals between 18 and 65 years of age who were living in the community and were rehabilitated after injury in a specialized rehabilitation centre between 1986 and 1992. Persons with a spinal cord injury resulting from a malignant tumour were excluded. Five hundred and twenty-five persons met these criteria. From this group, 423 persons could be reached and 315 persons participated in the study (response rate 60%). There were no statistically significant differences at an alpha level of 1% between the response group and the non-response group with regard to type of spinal cord injury, cause of spinal cord injury, age, gender and time after discharge from the rehabilitation centre. All respondents were interviewed at home.

The SCI group contained 318 persons and Table I contains data on their age, gender, marital status, vocational status, type and cause of injury. About 15% of the SCI group had an injury related to a disease or some form of medical treatment, such as spinal stenosis, benign tumours and vascular problems. Respondents with non-traumatic injuries (mean age 47.8 years) were older than respondents with traumatic injuries (mean age 37.0 years). Most respondents (60.0%) were wheelchair-dependent, 44.5% needed help with getting dressed and 27.7% needed help with personal care.

Population group. A random sample of 1200 persons between 18 and 65 years of age was taken from the municipal register from the city of Utrecht. These persons received a mailed questionnaire and were offered a small amount of money for participating. No reminder was sent. The response rate was 42% ($n = 507$), which is analogous to other research with this method. In the response group, women were overrepresented (58.2% against 52.5% according to municipality figures) but no age differences were found.

There were more women, students, employees and younger respondents in the population group than in the SCI group (Table I). The proportion of married respondents is lower than

Table I. Characteristics of respondents

	SCI persons (n = 318)	Population (n = 507)
<i>Age (years)</i>		
% 18–25	15.5	26.0
% 26–35	28.4	34.5
% 36–45	22.4	17.6
% 46–55	20.2	11.4
% 56–65	13.6	10.5
<i>Gender</i>		
% Male	75.4	41.2
% Female	24.6	58.4
<i>Marital status</i>		
% Married or cohabitating	63.2	50.5
<i>Vocational status</i>		
% Unemployed	49.4	6.7
% Student	5.0	19.5
% Housekeeper	14.2	10.5
% Paid work	31.4	63.3
<i>Type of injury</i>		
% Complete tetraplegia	21.7	–
% Incomplete tetraplegia	20.4	–
% Complete paraplegia	29.2	–
% Incomplete paraplegia	28.6	–
<i>Cause of injury</i>		
% Traffic accident	34.9	–
% Occupational accident	12.9	–
% Illness, medical treatment	17.9	–
% Sports accidents	15.1	–
% Falls	9.1	–
% Other	9.4	–

in the SCI group but, unlike the unmarried SCI persons, many of them have relationships.

Instruments

The LSQ (14, 15) contains one question about general life satisfaction and eight questions about domain-specific life satisfaction: self-care ability, leisure situation, vocational situation, financial situation, sexual life, partnership relations, family life and contacts with friends and acquaintances. All nine questions can be answered on a six-point scale (1 = very dissatisfied up to 6 = very satisfied). We translated the scale from the English version and compared this translation with one made by a professional translator from the Swedish original. However, unlike Fugl-Meyer and associates, we used mean scores of 1–6 instead of proportions of satisfied persons (scores 5 or 6) as outcome figures.

Demographic variables taken into account were age, gender, marital status (married or living together, as opposed to single) and educational level (eight levels, from primary school up to university).

In the SCI group, respondents were grouped according to their type of injury: complete tetraplegia (Frankel grade A or B), incomplete tetraplegia (Frankel grade C or D), complete paraplegia (Frankel grade A or B) and incomplete paraplegia (Frankel grade C or D).

Statistics

Mean scores on LSQ items were used to compare SCI persons to the population group and to detect differences within the SCI group. First, tests for significance were performed by non-parametric methods, followed by logistic regression analysis to check the impact of group membership (SCI persons versus population) on dichotomized satisfaction scores (not satisfied, scores 1–4; against satisfied, scores 5 or 6), controlled for the impact of demographic variables: age (younger than 35 years as against 35 years and up) and marital status. With this model, coefficients comparable to ordinary regression coefficients were determined, so that the probability of being satisfied (or non-satisfied) can be computed for every combination of scores on the independent variables (for example young, single SCI persons). The odds of a circumstance (being satisfied) is the ratio of the probability that it will occur to the probability that it will not. For example, if 64.2% are satisfied, the odds of being satisfied is $0.642/(1 - 0.642) = 1.79$. The odds ratio is the factor by which the odds change when, for instance, the value of group membership increases from zero (SCI persons) to unity (population). The odds ratio reflects the importance of a variable in the prediction of being satisfied/non-satisfied related to the importance of all other independent variables. A completely unimportant variable has an odds ratio of unity (no change of odds), and an odds ratio of 0.5 indicates the same importance as an odds ratio of 2. The *p*-value of the Wald statistic is also given. It is the probability of odds to be zero, and indicates whether or not an independent variable is a significant predictor of the dependent variable. All results are taken to be significant at a *p*-level below 0.01.

RESULTS

Life satisfaction

In the SCI group, the mean score on the happiness item was 4.41 on the 1–6 scale (between “rather satisfied” and “satisfied”). Highest satisfaction existed with the three social domains: contacts with friends and acquaintances (score 4.74), family life (score 4.80) and partnership relations (score 4.88). The lowest mean scores were on the items: sexual life (score 3.13) and vocational situation (score 3.80). A substantial proportion of the respondents did not answer the questions about satisfaction with vocational status (59) and partnership relations (79). They were vocationally inactive or single and said that the questions were not applicable to their situation. Otherwise, the mean score on these questions would have been lower, because those who were vocationally inactive or single and who answered these questions gave considerably lower ratings than the other respondents (3.05 against 4.46, and 3.37 against 5.40, respectively).

Table II shows all life satisfaction scores per type of injury. Happiness was somewhat lower in persons with complete tetraplegia, but differences in general life satisfaction within the SCI group were not significant ($p = 0.024$). The same was true for the eight domain-specific life satisfaction items: only satisfaction with self-care ability was significantly lower in persons with tetraplegia.

Table II. Mean life satisfaction scores of SCI persons related to type of injury and the population

	Complete tetraplegia (n = 65)	Incomplete tetraplegia (n = 62)	Complete paraplegia (n = 89)	Incomplete paraplegia (n = 91) ^a	Population (n = 507) ^b
Life as a whole	4.01	4.46	4.56	4.50	4.68*
Self-care ability	2.85	4.05	4.69	5.06**	5.67**
Leisure situation	4.19	4.33	4.60	4.44	4.73*
Vocational situation	3.59	3.82	3.98	3.98	4.37**
Financial situation	4.06	3.84	4.06	4.37	4.23
Sexual life	3.10	3.36	3.03	3.18	4.14**
Partnership relations	4.55	4.77	4.74	4.86	4.46
Family life	4.96	4.75	4.84	4.80	4.43*
Contacts, friends and acquaintances	5.09	4.98	4.96	4.74	4.91

^a Differences within the SCI group that are significant: ** $p < 0.001$.

^b Differences between SCI persons and controls that are significant: * $p < 0.01$; ** $p < 0.001$.

Table II shows scores of the population group. In this group, the mean score for happiness was 4.68. Satisfaction with self-care ability was almost maximal and the other scores were between 4 (rather satisfied) and 5 (satisfied). Lowest satisfaction existed with financial situation, sexual situation and vocational situation. Regarding happiness and four out of eight life domains, SCI persons were less satisfied with their lives than persons in the population group. On all three social items, SCI persons had a higher mean score, but this difference was only significant on the family-life item.

Associations with demographic variables

In both groups, possible associations of life satisfaction with age, gender, education and marital status were investigated. Scores on the happiness item related to demographic variables are given in Table III. In both groups, gender and education did not have any significant relationship with either general satisfaction or domain-specific satisfaction (not in Table III). However, in both groups satisfaction with financial situation was weakly related to educational level (0.15 in the SCI group and 0.13 in the population group).

In the SCI group, respondents who were married or living together were more satisfied about their financial situation (4.31 against 3.83) and partnership relationships (5.40 against 3.37) than single respondents. Surprisingly, no differences were found regarding satisfaction with sexual life and family life. Younger respondents scored higher on happiness (Spearman correlation -0.15) and were more satisfied with self-care ability (-0.17), leisure situation (-0.16) and sexual life (-0.21), but they were less satisfied about their family relations (0.24). Vocationally active SCI persons were more satisfied than vocationally inactive persons with their self-care ability (3.88 against 4.69) vocational situation (3.05 against 4.46) and financial

situation (3.84 against 4.39). Time after injury did not have a significant correlation with general life satisfaction, although a slight rise was seen. Cause of the injury did not make any difference at all.

In the population group, being married or living together

Table III. Associations (scores) of general life satisfaction with characteristics of respondents

	SCI persons (n = 318)	Population (n = 507)
<i>Age (years)</i>		
18–25	4.71	4.86
26–35	4.47	4.65
36–45	4.51	4.69
46–55	4.13	4.47
56–65	4.21*	4.62
<i>Gender</i>		
Male	4.44	4.70
Female	4.34	4.67
<i>Marital status</i>		
Married or cohabitating	4.44	4.80
Single	4.38	4.56*
<i>Vocational status</i>		
Unemployed	4.27	4.56
Student	4.50	4.82
Housekeeper	4.43	4.51
Paid work	4.63	4.74
<i>Time after injury (years)</i>		
0–1	4.00	–
2–3	4.29	–
4–5	4.57	–
6–7	4.53	–
<i>Cause of injury</i>		
Traffic accident	4.36	–
Occupational accident	4.30	–
Illness, medical treatment	4.52	–
Sports accidents	4.67	–
Falls	4.41	–
Other	4.32	–

had more of an impact: married respondents were happier (4.86 against 4.58) and more satisfied with their financial situation (4.59 against 3.91), sexual life (4.51 against 4.01), partnership relations (5.14 against 4.23) and family life (5.15 against 4.26). Younger respondents were more satisfied with their self-care ability (-0.21), were less satisfied with their financial situation (0.24) and were more satisfied with their relationships with friends and acquaintances (-0.17).

Adjusted impact of spinal cord injury on life satisfaction

Table IV shows the results of a series of logistic regression analyses. In addition to the odds ratio and the *p*-value of the Wald statistic, Table IV shows the percentage of correctly predicted life satisfaction. This indicates, corresponding to the amount of explained variance in regression analysis, the predictive power of all three independent variables together. Gender and education were not incorporated in these analyses because they did not have any bi-variate relationships with life satisfaction variables. Table IV shows that age and marital status were significant predictors of happiness, that group membership was not and that 65.6% correctly predicted cases was not very impressive. Group membership was most important in satisfaction with self-care ability, sexual functioning and, finally, in addition to marital status, in satisfaction with family life. By comparison with the results of Table II, established differences between SCI persons and their controls regarding happiness and satisfaction with leisure situation and vocational situation turned out to be attributable to other variables instead of spinal cord injury.

DISCUSSION

Life satisfaction in SCI persons

Other relevant studies of happiness and domain-specific life

satisfaction in SCI persons are summarized in Table V. Because many different scales were used, a new score on a 0–100 scale was computed in order to facilitate a rough comparison. For instance, a score of 3 on a 1–5 scale was transformed into a score of 50 on the 0–100 scale by subtracting 1 (lowest possible score), dividing by 4 (highest possible score subtracted by lowest possible score) and multiplying by 100. Caution should be exercised in making interpretations due to this transformation and to differences in the formulation of the questions and answers.

Table V shows that, like our study, most other studies reported low satisfaction with vocational situation and sexual life. Also, the level of happiness was about the same in our study as in other studies. Furthermore, we reported relatively high levels of domain-specific life satisfaction as compared to other studies. Only one study (13) found a similar level of satisfaction with social life. Carlson (7) and Crewe & Krause (9) reported extremely low figures on all life domains. However, Dunnum (13) found very high satisfaction with sexual life. Bach & Tilton (2) reported relatively low levels of satisfaction, but this was in a group of persons with complete tetraplegia. In our study, figures in the complete tetraplegia group were a little higher than those in Bach's study. In summary, the life satisfaction figures in this study appear to be equal or slightly better than those of other studies, all conducted in North America. However, as mentioned before, the use of different questionnaires seriously hampers such comparisons.

Happiness and domain-specific life satisfaction in SCI persons

Answers on questions about domain-specific life satisfaction appeared to be more closely related to material

Table IV. Logistic regression of associations of group membership (SCI or population), age and marital status with life satisfaction

	Age		Marital status		Group membership		% Correct predicted
	Odds ratio	<i>p</i> -value	Odds ratio	<i>p</i> -value	Odds ratio	<i>p</i> -value	
Life as a whole	1.82	0.0003	1.89	0.0001	1.22	0.2024	65.60
Self-care ability	2.49	0.0001	1.49	0.0793	8.81	0.0000	80.96
Leisure situation	1.55	0.0077	1.48	0.0160	1.28	0.1091	65.48
Vocational situation	1.27	0.1240	1.27	0.1263	1.45	0.0127	55.56
Financial situation	0.85	0.2895	2.06	0.0000	1.04	0.8026	59.78
Sexual life	1.53	0.0089	1.83	0.0002	2.47	0.0000	62.32
Partnership relations	1.78	0.0025	7.82	0.0000	0.80	0.1995	70.28
Family life	1.63	0.0055	2.92	0.0000	0.54	0.0003	70.57
Contacts, friends and acquaintances	1.39	0.0658	1.13	0.4996	0.83	0.2942	75.68

Table V. Comparison of mean satisfaction with life domains (recoded into a 0-100 scale) of SCI persons between this investigation and the available literature

	Holland (n = 318) interview 1-6 scale	Texas ^a (n = 140) mailed questionnaire 1-4 scale	Newark NJ ^b (n = 87) mailed questionnaire 1-7 scale	N. Carolina ^c (n = 31) telephone interview 1-5 scale	USA ^d (n = 54) interview 4-16 scale	S. Carolina ^e (n = 100) interview 1-7 scale	Canada ^f (n = 82) mailed questionnaire 1-10 scale	Minnesota ^g (n = 154) mailed questionnaire 1-5 scale
Life as a whole	68.2	-	51.5/56.5 ^h	66.3	-	66.8	58.0	80.9
Self-care ability	65.2	71.1	-	55.3	-	-	65.0	-
Leisure situation	68.2	59.3	-	-	33.6	56.5	62.0	-
Vocational situation	57.2	43.3	42.3/69.5	-	31.3	-	-	34.3
Financial situation	62.2	47.0	-	48.3	-	46.3	55.0	41.5
Sexual life	43.2	45.6	36.2/34.7	62.5	37.6	-	-	45.5
Partnership relations	74.8	-	-	-	-	61.7	-	-
Family life	76.8	75.7	64.8/78.3	-	-	-	-	-
Contacts friends and acquaintances	78.6	65.0	56.0/58.0	71.3	25.0	55.7	-	26.3

^a Fuhrer et al. (16).

^b Bach & Tilton (2).

^c Dunnum (13).

^d Carlson (7).

^e Clayton & Chubon (8).

^f Bosscher (3).

^g Crewe & Krause (9).

^h Autonomously breathing persons with tetraplegia/ventilator-assisted persons with tetraplegia.

circumstances (the "objective" component of quality of life) than to answers on the happiness item. For instance, satisfaction with vocational situation was higher in vocationally active SCI persons than in vocationally inactive SCI persons, but both groups were equally happy. Perhaps happiness is influenced more by personality traits than domain-specific life satisfaction (38). A causal model is also a possibility, in which domain-specific life satisfaction items are intermediate variables between objective circumstances and happiness. For instance, Brown et al. (6) suggested that perceptions of health are an intervening variable between objective health status and life satisfaction. Fugl-Meyer et al. (15) found that the domain-specific life satisfaction items were powerful classifiers of gross level of happiness. However, nothing can be said about causal relationships on the basis of these studies and our own research.

Comparisons with the general population

General life satisfaction and satisfaction with four out of eight domains were lower in SCI persons than in the population group, but the logistic regression analyses showed that some differences disappeared after adjustment for age and marital status. Satisfaction with self-care ability and sexual life remained lower, and satisfaction with family life remained higher in SCI persons. Other comparisons of life satisfaction between SCI persons and population groups also revealed somewhat lower figures in the SCI group (2, 3, 8, 16, 28, 34, 43). Unfortunately, these authors did not adjust their comparisons for the influence of demographic variables, so it is possible that their figures are less positive than is necessary. Other authors have reported high or comparable to normal general life satisfaction ratings in SCI persons (7, 9, 26, 35), but Carlson (7) and Levi et al. (26) used only anxiety measures for comparison, and Sjösteen et al. (35) and Krause & Crewe (9) did not provide a direct comparison with a control group. In short, life satisfaction ratings of SCI persons appear to be close to those of the population (37), although at some domains lower levels of life satisfaction were found.

Demographic correlates of life satisfaction

We found a weak relationship with age and no relationship with the duration of injury, but the range of time after injury in our study was very limited. However, Whiteneck (41) and Pentland et al. (31) presented identical results. Others (2, 8, 16) reported no relationships with age or time after injury or reported, on the contrary, relationships with both (24, 28).

Krause & Crewe (24) performed the most sophisticated comparisons and found that effects of age and time after injury often worked in opposing directions.

We found no relationships with gender or, in the SCI group, with marital status, and neither did Bach & Tilton (2) (gender) and Lundqvist et al. (28) (gender and marital status).

Type of injury and life satisfaction

Using the LSQ total score, we found somewhat lower life satisfaction in more seriously injured persons. However, no differences were found in seven out of eight life domains or in general life satisfaction. Other studies showed mixed results. Clayton & Chubon (8) found a lower life satisfaction in persons with tetraplegia than in persons with paraplegia. Gerhart (18) reported that out of the respondents who rated their quality of life as excellent, none had complete injuries. However, most authors (2, 11, 16, 33, 35, 41) did not find, as we did, any differences relating to the seriousness of the injury. We may conclude that being SCI is more important for life satisfaction than the type of injury.

CONCLUSION

In a community-based sample of the SCI in The Netherlands, a good to fair level of life satisfaction was found, although it lay below the scores of a comparison group. Sexual life and vocational situation were the lowest rated life domains and perhaps need more attention during rehabilitation. Further research regarding interrelationships of happiness and domain-specific life satisfaction is recommended. Some uniformity in measurement instruments would facilitate comparisons between studies.

ACKNOWLEDGEMENT

This study was funded by a grant from Utrecht University.

REFERENCES

1. Adams, D. L.: Analysis of a life satisfaction index. *J Gerontol* 24: 470-474, 1969.
2. Bach, J. R. & Tilton, M. C.: Life satisfaction and well-being measures in ventilator assisted individuals with traumatic tetraplegia. *Arch Phys Med Rehabil* 75: 626-632, 1994.
3. Boschen, K. A.: Life satisfaction, housing satisfaction, and locus of control: a comparison between spinal cord injured and non-disabled individuals. *Can J Rehabil* 4:75-85, 1990.
4. Bränholm, I-B.: On life satisfaction, occupational roles and activity preferences: occupational therapy aspects. Dissertation University of Umeå, 1992.

5. Brånholm, I-B. & Erhardsson, M.: On life satisfaction and activity preferences in subjects with multiple sclerosis: a comparative study. *Scand J Occup Ther J*: 17–23, 1994.
6. Brown, J. S., Rawlinson, M. E. & Hilles, N. C.: Life satisfaction and chronic disease: exploration of a theoretical model. *Med Care* 19: 1136–1146, 1981.
7. Carlson, C. E.: Conceptual style and life satisfaction following spinal cord injury. *Arch Phys Med Rehabil* 60: 346–352, 1979.
8. Clayton, K. S. & Chubon, R. A.: Factors associated with the quality of life of long-term spinal cord injured persons. *Arch Phys Med Rehabil* 75: 633–638, 1994.
9. Crewe, N. M. & Krause, J. S.: An eleven-year follow-up of adjustment to spinal cord injury. *Rehabil Psychol* 35: 205–210, 1990.
10. Crisp, R.: Long-term adjustment of 60 persons with spinal cord injury. *Aust Psychol* 27: 43–47, 1992.
11. Cushman, L. A. & Hasset, J.: Spinal cord injury: 10 and 15 years later. *Paraplegia* 30: 690–696, 1992.
12. Dew, M. A., Lynch, K., Ernst J. & Rosenthal, R.: Reaction and adjustment to spinal cord injury: a descriptive study. *J Appl Rehabil Counsel* 14: 32–39, 1983.
13. Dunnun, L.: Life satisfaction and spinal cord injury: the patient perspective. *J Neurosc Nurs* 22: 43–47, 1990.
14. Fugl-Meyer, A. R., Brånholm, I-B. & Fugl-Meyer, K. S.: Happiness and domain-specific life satisfaction in adult Northern Swedes. *Clin Rehabil* 5: 25–33, 1991.
15. Fugl-Meyer, A. R., Eklund, M. & Fugl-Meyer, K. S.: Vocational rehabilitation in Northern Sweden III. *Scand J Rehab Med* 23: 83–87, 1991.
16. Fuhrer, M. J., Rintala, D. H., Hart, K. A., Clearman, R. & Young, M. E.: Relationship of life satisfaction to impairment, disability, and handicap among persons with spinal cord injury living in the community. *Arch Phys Med Rehabil* 73: 552–557, 1992.
17. Fuhrer, M. J.: Subjective well-being: implications for medical rehabilitation outcomes and models of disablement. *Am J Phys Med Rehabil* 73: 358–364, 1994.
18. Gerhart, K.A.: Spinal cord injury outcomes in a population-based sample. *J Trauma* 31: 1529–1535, 1991.
19. Gerhart, K. A., Koziol-McLain, J., Lowenstein, S. R. & Whiteneck, G. G.: Quality of life following spinal cord injury: knowledge and attitudes of emergency care providers. *Ann Emergency Med* 23: 807–812, 1994.
20. Hornquist, J. O.: The concept of quality of life. *Scand J Soc Med* 10: 57–61, 1982.
21. Johnston, M. V. & Granger, C. V.: Outcomes research in medical rehabilitation: a primer and introduction to a series. *Am J Phys Med Rehabil* 73: 296–303, 1994.
22. Kinney, W. B. & Coyle, C. P.: Predicting life satisfaction among adults with physical disabilities. *Arch Phys Med Rehabil* 73: 863–869, 1992.
23. Knippenberg, F. C. E. & de Haes, J. C. J. M.: Measuring the quality of life of cancer patients: psychometric properties of instruments. *J Clin Epidemiol* 41: 1043–1053, 1988.
24. Krause, J. S. & Crewe, N. M.: Chronologic age, time since injury, and time of measurement: effect on adjustment after spinal cord injury. *Arch Phys Med Rehabil* 72: 91–100, 1991.
25. Krause, J. S. & Kjorsvig, J. M.: Mortality after spinal cord injury: a four year prospective study. *Arch Phys Med Rehabil* 73: 558–563, 1992.
26. Levi, R., Hultling, C. & Seiger, Å.: The Stockholm spinal cord injury study: 4. Psychosocial and financial issues of the Swedish annual level-of-living survey in SCI subjects and controls. *Paraplegia* 34: 152–157, 1996.
27. Lundmark, P. & Brånholm, I-B.: Relationship between occupation and life satisfaction in people with multiple sclerosis. *Disabil Rehabil* 18: 449–453, 1996.
28. Lundqvist, C., Siösteen, A., Blomstrand, C., Lind, B. & Sullivan, M.: Spinal cord injuries: clinical, functional and emotional status. *Spine* 16: 78–83, 1991.
29. McDowell, I. & Newell, C.: Measuring health: a guide to rating scales and questionnaires. Oxford University Press, Oxford, 1987.
30. Patrick, D. L. & Deyo, R. A.: Generic and disease-specific measures in assessing health status and quality of life. *Med Care* 27: S217–S232, 1989.
31. Pentland, W., McColl, M.A. & Rosenthal, C.: The effect of aging and duration of disability on long-term health outcomes following spinal cord injury. *Paraplegia* 33: 367–373, 1995.
32. Piepmeier, J. M. (ed.): The outcome following traumatic spinal cord injury. Futura, Mount Kisco, NY, 1992.
33. Richards, J. S.: Psychologic adjustment to spinal cord injury during first postdischarge year. *Arch Phys Med Rehabil* 67: 362–365, 1986.
34. Schultz, R. & Decker, S.: Long-term adjustment to physical disability: the role of social support, perceived control, and self-blame. *J Pers Soc Psychol* 48: 1162–1172, 1985.
35. Siösteen, B. A., Lundqvist, C., Blomstrand, C., Sullivan, L. & Sullivan M.: The quality of life of three functional spinal cord injury subgroups in a Swedish community. *Paraplegia* 28: 476–488, 1990.
36. Stensman R.: Adjustment to traumatic spinal cord injury. A longitudinal study of self-reported quality of life. *Paraplegia* 32: 416–422, 1994.
37. Trieschmann, R. B.: Spinal cord injuries: Psychological, social and vocational rehabilitation, 2nd ed. Demos, New York, 1988.
38. Veenhoven, R.: Conditions of happiness. D. Reidel, Dordrecht, 1984.
39. Viitanen, M., Fugl-Meyer, K. S., Bernspång, B. & Fugl-Meyer, A.R.: Life satisfaction in long-term survivors after stroke. *Scand J Rehabil Med* 20: 17–24, 1988.
40. Wagner Anke, A. G., Stenehjelm, A. E. & Kvalvik Stanghelle, J.: Pain and life quality within 2 years of spinal cord injury. *Paraplegia* 33: 555–559, 1995.
41. Whiteneck, G. G.: Changing attitudes toward life. In *Aging with spinal cord injury* (ed. G. G. Whiteneck, S. W. Charlifue, K. A. Gerhart, D. P. Lammertse, S. Manley, R. R. Menter & K. R. Seedorf), pp. 211–218. Demos, New York, 1993.
42. Whiteneck, G.G.: Measuring what matters: key rehabilitation outcomes. *Arch Phys Med Rehabil* 75: 1073–1076, 1994.
43. Yerxa, E. J.: Engagement in daily occupations and life satisfaction among people with spinal cord injuries. *Occup Ther J Res* 6: 271–283, 1986.

Accepted March 13, 1997

Address for offprints:

Marcel W. M. Post
 Julius Centre for Patient Oriented Research
 Utrecht University
 P.O. Box 80046
 NL-3508 TA Utrecht, The Netherlands