



ORIGINAL ARTICLE

Psychometric Properties of the Nottwil Environmental Factors Inventory Short Form

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Abstract

Objectives: To examine the psychometric properties of the Nottwil Environmental Factors Inventory Short Form using Rasch analysis; to determine its construct validity and internal consistency; and to develop a metric for scoring.

Design: Cross-sectional psychometric study. Construct validity of the Nottwil Environmental Factors Inventory Short Form, including model fit, person and item fit, local item dependence, dimensionality, and differential item functioning (DIF), was investigated with Rasch analysis. Internal consistency was assessed with Cronbach alpha and item-total correlations.

Setting: Community.

Participants: Swiss residents aged >16 years and living with traumatic or nontraumatic spinal cord injury (SCI) (N=1549).

Interventions: Not applicable.

Main Outcome Measure: The Nottwil Environmental Factors Inventory Short Form, a 14-item questionnaire developed to assess perceived impact of environmental barriers on participation.

Results: Local dependencies between items addressing a similar content could be solved by creating a testlet. With 1 testlet there was strong evidence for unidimensionality of the Nottwil Environmental Factors Inventory Short Form. Although person-item targeting revealed a floor effect, indicating few perceived environmental barriers to participation in the Swiss SCI population, the item fit was good. Only a few items presented DIF. The Nottwil Environmental Factors Inventory Short Form showed good internal consistency ($\alpha = .82$).

Conclusions: This psychometric analysis supports the use of the Nottwil Environmental Factors Inventory Short Form to evaluate perceived environmental barriers to participation in persons with SCI living in the community.

Archives of Physical Medicine and Rehabilitation 2014; ■: ■ ■ ■ - ■ ■ ■

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Spinal cord injury (SCI) is a severely disabling condition, in many cases leading to secondary health conditions, activity limitations, and participation restrictions. Persons with the same diagnosis may nevertheless experience different levels of disability (meaning problems in functioning) because of the presence or absence of environmental barriers and facilitators.¹⁻⁴ A number of instruments have been used to measure environmental factors in

individuals with SCI⁵; the most frequently used is the Craig Hospital Inventory of Environmental Factors.⁶ However, none of these instruments have been specifically developed for use in individuals with SCI, and none completely cover all environmental factors indicated as important by individuals with SCI, as specified in the *International Classification of Functioning, Disability and Health's* Core Sets for SCI.^{5,6}

The Nottwil Environmental Factors Inventory is an interviewer-administered assessment of perceived environmental barriers and facilitators. It is based on outcomes of the *International Classification of Functioning, Disability and Health's* Core Sets for SCI project⁷⁻⁹ and is composed of 56 items covering 13

Presented to the International Spinal Cord Society, October 27–30, 2013, Istanbul, Turkey.
Supported by the Swiss Paraplegic Foundation and financed in the framework of the Swiss Spinal Cord Injury Cohort Study.
Disclosures: none.

environmental factors as perceived barriers and perceived facilitators for different participation domains (productive life vs social/community life), including items on overcoming and avoidance of barriers, as described in detail elsewhere (Graf, unpublished data, 2014). Psychometric testing of the full Nottwil Environmental Factors Inventory is forthcoming.

Although the Nottwil Environmental Factors Inventory provides a comprehensive assessment of the perceived impact of environmental barriers and facilitators on different participation domains, it is too extensive for use in a postal or web-based questionnaire alongside several other measures. For the use in these questionnaires, we developed a short form of the Nottwil Environmental Factors Inventory, which focuses on the perceived impact of environmental barriers on participation in general, while refraining from assessment of facilitators and overcoming and avoidance of barriers.

We aimed to examine the psychometric properties of the Nottwil Environmental Factors Inventory Short Form, to determine its construct validity and internal consistency, and to develop a metric for scoring.

Methods

Setting

This cross-sectional psychometric study makes use of data that were collected between September 2011 and March 2013 in a survey of people with SCI who are living in Switzerland. This survey was part of the Swiss Spinal Cord Injury Study (SwiSCI).¹⁰

The SwiSCI was formally approved by both the Ethics Committee of the Canton of Lucerne and the location of the main study center (ethics registration no. 11042). It was subsequently endorsed by the Ethics Committees of the Cantons Zürich, Basel-Stadt, and Valais, which are the committees liable for the other 3 participating rehabilitation centers.

Participants

The study population of the SwiSCI included Swiss residents aged >16 years and living with traumatic or nontraumatic SCI. Recruitment and eligibility criteria are detailed elsewhere.⁹

The Nottwil Environmental Factors Inventory Short Form could be completed on paper, through the SwiSCI website, or by phone interview in German, French, or Italian. The overall response rate to the module of the questionnaire that contained the Nottwil Environmental Factors Inventory Short Form was 49.3%. The analysis of the psychometric properties of the Nottwil Environmental Factors Inventory Short Form was performed on a sample of 1549 participants. Characteristics of the participants are given in [table 1](#).

List of abbreviations:

DIF	differential item functioning
PCA	principal component analysis
PCM	partial credit model
SCI	spinal cord injury
SwiSCI	Swiss Spinal Cord Injury Study

Table 1 Descriptive statistics of the random sample of 1549 Nottwil Environmental Factors Inventory Short Form participants

Characteristics	Specification	Value
Questionnaire type	Online	41.9
	Paper and pencil	57.1
	Telephone	1.0
Language	German	70.2
	French	25.3
	Italian	4.5
Season	Fall	5.0
	Spring	17.6
	Summer	47.4
	Winter	30.1
Sex	Male	71.5
SCI type	Paraplegia	69.2
SCI degree	Complete	42.0
Age (y)		55.36 (44.9–66.1)
Time since injury (y)		14.24 (7.0–25.3)
Years of education		13.1 (11.9–15.4)

NOTE. Values are percentages or median (first and third interquartile).

Main outcome measures

The Nottwil Environmental Factors Inventory Short Form consists of 14 items with 3 response options: 0 (no influence/not applicable), 1 (made my life a little harder), and 2 (made my life a lot harder). The response options were used to rate the perceived impact of 14 environmental factors on the respondents' social participation during the last 4 weeks. The questionnaire is reproduced in [appendix 1](#). The full version of the Nottwil Environmental Factors Inventory was developed simultaneously in English, German, and French. Corresponding language versions of the Nottwil Environmental Factors Inventory Short Form were derived from the full version. Based on the German version, an Italian translation of the Nottwil Environmental Factors Inventory Short Form was derived by 2 bilingual researchers following a mutual cross-check of the initial versions.

Data analysis

Missing values

Item nonresponse affected <10% of the observations for all items. To account for item nonresponse in the data analysis, missing values were assumed to be missing at random¹¹ and were imputed with a robust random permutation algorithm as implemented in the R package *missForest*.^{12,a}

Construct validity

Rasch analysis was carried out to examine the construct validity of the Nottwil Environmental Factors Inventory Short Form at instrument, person, and item levels. Rasch analysis is a probabilistic approach to estimate the difficulty of items in questionnaires accounting for different levels of ability in persons of a sample.¹³ The Nottwil Environmental Factors Inventory Short Form was analyzed with a partial credit model (PCM), a Rasch model for ordinal responses.¹⁴

Rasch models have their origin in educational sciences. In the educational field, a high score stands for more skills. In contrast,

in the present context, a high item score indicates a higher impact of environmental barriers on participation. The interpretation of item difficulty in the present context is hence opposite to the interpretation in educational sciences (ie, a high item difficulty estimate relates to environmental factors, which only few people perceive as a barrier). Similarly, persons achieving a lower score on the Nottwil Environmental Factors Inventory Short Form items face less environmental barriers to their participation and are assigned lower person ability.

Item difficulty and person ability were estimated with conditional maximum likelihood. They range on a logit scale, which is an interval scale and allows for comparison of scores. Consequently, the total score on a scale can be rescored taking into account the Rasch estimated item difficulties and then rescaled in a range from 0 to 100. The conversion table for the rescaling of the total Nottwil Environmental Factors Inventory Short Form score (0–100) is provided in [appendix 2](#).

Based on the PCM, dimensionality, and local item dependencies, matches between person abilities and item difficulties, item fit, ordering of estimated thresholds of response options, and differential item functioning (DIF) were examined.

Dimensionality and local item dependence

In measurement scales, a set of items is expected to be unidimensional, with items being locally independent from each other. Both the analysis of dimensionality and local item dependencies make use of the distribution of the standardized residuals of Rasch analysis. To assess dimensionality, residuals were analyzed with a principal component analysis (PCA) to detect nonrandom patterns. These patterns are expressed in terms of item loadings on common latent factors. Above a certain cutoff point, loadings are indicative of commonalities between the residuals of some items and the residuals of others.¹⁵ Given the small number of items, a second eigenvalue >1.4 was considered as strong evidence for multiple dimensions.¹⁶

Items can be considered locally dependent with residual correlations above an absolute value of 0.3. In the presence of local item dependencies, testlets were constructed by aggregating dependent items into 1 superitem.¹⁷ Dimensionality and local item dependencies are related; both indicate the presence of content areas in a construct. A PCA revealing >1 dimension may be related to local item dependencies. Consequently, PCA needs to be repeated after aggregating items showing local item dependencies.

Match between item difficulty and person ability

A match between difficulty of the Nottwil Environmental Factors Inventory Short Form items and ability was assessed, and possible floor and ceiling effects were determined. As found in McHorney and Tarlov,¹⁸ the measure was considered to show a floor effect when $>15\%$ of the participants showed the lowest possible score, implying no perceived barriers. Conversely, the cutoff for a ceiling effect was $>15\%$ of the participants having the highest possible score, implying the perception of comprehensive barriers.

A floor effect is not a clear-cut indicator of lack of sensitivity of a measure of environmental barriers. Less incapacitated populations (eg, people with motor incomplete injuries) are anticipated to less frequently perceive barriers and consequently more frequently show a floor effect than those with more severe injuries. In the presence of floor or ceiling effects, associations were examined between having the lowest or

highest possible score and sociodemographic- and injury-related characteristics.

Item fit

Item difficulty estimates should have a small error of measurement. Item fit analysis is based on the infit and outfit mean squared errors.¹⁹ Item goodness of fit was considered appropriate within a range of mean squared errors between 0.7 and 1.3.^{20,21}

Ordering of thresholds

The estimated thresholds for response options should be ordered with increasing levels of difficulty. Whenever the response options appeared disordered, collapsing of the response options was carried out.

Differential item functioning

DIF analysis investigated invariance of the Rasch-based item difficulty estimates with an analysis of variance. DIF analysis allows for the detection of significant differences in levels of difficulty of items across subgroups with regard to sociodemographic groups (age, sex, years of education), SCI characteristics (lesion level: paraplegia vs tetraplegia; completeness: complete vs incomplete; time since injury), and assessment characteristics (German, French, or Italian language; paper pencil vs Internet assessment; winter, spring, summer, or fall). Education years, age, and time since injury were split at the median. Only the uniform DIF for the group effect is reported. The level of significance of DIF was Bonferroni adjusted for repeated measurements.

Internal consistency

Internal consistency of the Nottwil Environmental Factors Inventory Short Form, after adjustments made based on Rasch analysis, was determined with Cronbach alpha, with a person separation index and corrected item-total correlations. Cronbach alpha for an instrument to be usable in a survey should not be <0.7 and preferably ≥ 0.8 to support internal consistency.²² A small item-total correlation indicates that an item is not consistent with the overall scale. Item-total correlations with values <0.2 to 0.3 are critical and suggest that items may need to be removed.²³

The analyses conform to recommendations for modern psychometric testing with Rasch analysis²⁴ and were performed with R packages eRm²⁵ and ltm²⁶ for PCM analysis.

Results

Construct validity

Dimensionality

The initial PCM analysis identified 2 pairs of locally dependent items: attitudes of friends and attitudes of colleagues and attitudes of family and attitudes of friends (correlations, $r = .29$ and $r = .35$, respectively). In the subsequent step, these 3 items (family, friend's, and colleague's attitudes) were joined in a testlet, and the 7 response options of the testlet were collapsed into the original 3 levels (score of 0=0; scores 1–3=2; scores 4–6=3) because some levels of the testlet had low frequencies of responses. After creating this testlet, the results of the PCA showed a first component of the residuals that explained 14.44% of the variance with a first eigenvalue of 1.73 and a second component with an eigenvalue of 1.34, which was below the threshold of 1.4.

Table 2 Nottwil Environmental Factors Inventory Short Form frequency of each response option, item difficulty estimates, thresholds, outfit MSQ, and infit MSQ

Items	No Influence	A Little Harder	A Lot Harder	Item Difficulty	Threshold 1	Threshold 2	Outfit MSQ	Infit MSQ
Climate	462	752	335	-1.36	-2.64	-0.07	1.18	1.17
Public access	616	694	239	-0.83	-2.00	0.34	0.88	0.88
Home access	821	554	174	-0.32	-1.23	0.59	0.85	0.90
Long-distance transportation	985	407	157	-0.05	-0.58	0.49	0.77	0.81
Political decisions	977	407	165	-0.09	-0.60	0.42	0.83	0.91
Short-distance transportation	981	440	128	0.07	-0.65	0.80	0.78	0.84
Financial situation	1089	326	134	0.17	-0.16	0.50	1.22	1.06
Social attitudes	1186	310	53	0.84	0.11	1.56	0.84	0.92
Personal care assistance	1354	153	42	1.17	1.10	1.25	0.83	0.90
Medical supplies	1324	187	38	1.19	0.86	1.53	0.95	0.97
Attitude of close persons	1230	286	33	1.16	0.28	2.04	1.07	0.91
Communication devices	1433	116	NA	1.57	1.57	NA	0.81	0.89

Abbreviations: MSQ, mean squared error; NA, not applicable.

Item fit

All items presented item infit and outfit mean squared errors between 0.77 and 1.22 (table 2). None of the items were considered misfitting.

Match between item difficulty and person ability

Person abilities ranged from -4.27 up to 3.41 logits, and item difficulties ranged from -2.71 to 2.38 logits. Although the difficulty of the items spread well along the Rasch scale, with a mean

item difficulty of .09, the mean person ability of -1.67 indicates issues with the targeting. Figure 1 indicates the thresholds where the probability of responding to either one or the other of 2 adjacent response options is 50% (white dots). The location, ie, the item difficulty (black dot), for each of the Nottwil Environmental Factors Inventory Short Form items is also shown. Figure 1 shows that the Nottwil Environmental Factors Inventory Short Form item addressing climate is the item where the participants reported most barriers, and the item of communication devices is

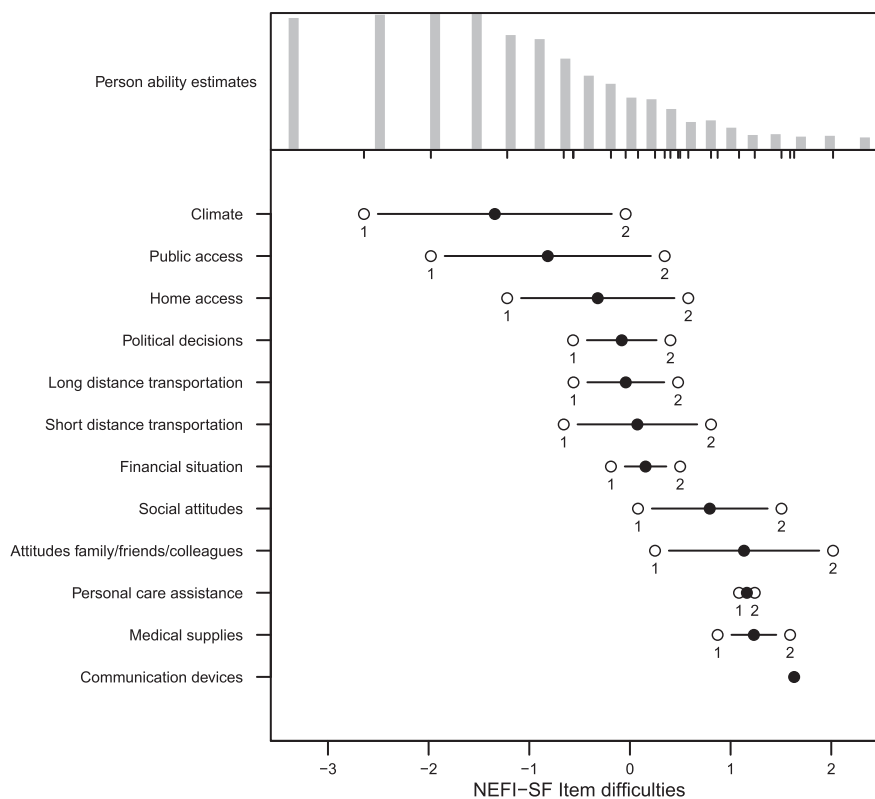


Fig 1 Person item map for the NEFI-SF showing thresholds (white dots) and location (black dots). Abbreviation: NEFI-SF, Nottwil Environmental Factors Inventory Short Form.

where the barriers to participation were perceived lowest. Because of disordered thresholds, 2 out of the 3 response categories of the item communication devices were collapsed. The remaining single threshold therefore gives the item difficulty. A substantial group of participants (23%) showed lower abilities than the least demanding Nottwil Environmental Factors Inventory Short Form item, indicating less perceived impact of environmental factors than the Nottwil Environmental Factors Inventory Short Form can measure.

Those who did not perceive barriers significantly differed from other participants in terms of sex, SCI level, SCI completeness, and time since injury. People who did not report any perceived barriers were more often men (77.01% vs 69.78%), had incomplete injuries (73.68% vs 53.28%), had paraplegia (72.85% vs 68.10%), and had a shorter time since injury (15.93y vs 17.47y).

Ordering of thresholds

The analysis with the testlet revealed disordered thresholds in the item addressing communication devices. For this item, the third and second response options were collapsed, before rerunning the analysis. A new PCM analysis with the aforementioned testlet and collapsed response option for communication devices did not reveal any local item dependencies, and all item thresholds were well ordered (see [fig 1](#)).

Differential item functioning

The analysis of DIF flagged 7 Nottwil Environmental Factors Inventory Short Form items showing any kind of DIF. DIF caused by completeness of SCI was found in 5 items: public access, social attitudes, financial situation, home access, and the testlet of the attitude of close persons. DIF caused by the level of SCI was found in 3 items: financial situation, personal care assistance, and communication devices. Finally, 2 items were sensitive to the language of the questionnaire: personal care assistance and home access. DIF was found in 10 items from a total of 108 comparisons (subgroups \times number of items).

Internal consistency

After the adjustment we made based on the Rasch analysis, the person separation index was .78, which indicates good usability at the group level but a lack of sensitivity for individual analyses, which goes along with the observed floor effect.²⁴ Cronbach alpha of .82 indicates good internal consistency ([table 3](#)). The item-total correlation was generally good. Communication devices had the smallest item-total correlation with $r = .34$. However, the removal of that single item did not lead to a significantly better internal consistency of the total scale, with regard to the confidence bounds of the Cronbach alpha of the whole Nottwil Environmental Factors Inventory Short Form.

Discussion

The Nottwil Environmental Factors Inventory Short Form has convincing psychometric properties and needed only a few adjustments to fit the PCM. Mainly, the Nottwil Environmental Factors Inventory Short Form required collapsing the response options for the communication device item and building a testlet for attitudes of friends, attitudes of family, and attitudes of colleagues before being unidimensional, free of local item dependencies, and showing good item and model fit. Item invariance was observed to a wide extent; only 9.3% (10 out of 108) of comparisons showed DIF, which is slightly above chance using a

Table 3 Nottwil Environmental Factors Inventory Short Form corrected item-total correlation, alpha without the item, and Cronbach alpha for the whole questionnaire with 95% upper and lower confidence intervals

Items	Item Total Correlation	Alpha Without Item
Climate	0.58	0.81
Public access	0.70	0.80
Home access	0.67	0.80
Long-distance transportation	0.67	0.80
Political decisions	0.65	0.80
Short-distance transportation	0.64	0.80
Financial situation	0.51	0.81
Social attitudes	0.53	0.81
Personal care assistance	0.40	0.81
Medical supplies	0.41	0.81
Attitude of close persons	0.46	0.81
Communication devices	0.34	0.82
Cronbach α (lower 95%-upper 95%)	0.82	(0.80–0.84)

type 1 error of 5% (a transformation table is provided in [appendix 2](#)).

The internal consistency of the Nottwil Environmental Factors Inventory Short Form was good. Therefore, the use of a total score to describe the perceived impact of environmental factors on the social participation of person's with SCI is justified.

Redundancy of items as indicated by local item dependencies was found for 3 of the attitude items: attitudes of friends, attitudes of family, and attitudes of colleagues. Further, the collapsing of response options of the communication device item was necessary to avoid disordered thresholds. Because this applied to only 1 item, it is advised to keep response options on the 3-point scale to avoid confusion for future study participants because of inconsistent response options across items.

A few items showed DIF for ≥ 1 of the tested subgroups. DIF was found for SCI level (3 items), SCI completeness (5 items), and language (2 items). Although the finding of DIF for the severity of the impairment suggests measurement bias, it also supports the sensitivity of the items to the different functioning levels with respect to the SCI characteristics.²⁷ In that respect, conditional on the latent trait measured, persons with tetraplegia when compared with persons with paraplegia perceived a lower impact of their financial situation but a higher impact of the quality or availability of personal care assistance and of communication devices on participation. Also, persons with incomplete injuries reported higher perceived impact on participation of their financial situation, social attitudes, and attitudes of others compared with persons with complete injuries, who reported a higher impact on participation for the home access item instead. These results are not surprising because in Switzerland more severe levels of injury are related to higher compensation payments on the one hand but to increased need for accessible environments and personal care assistance on the other. The DIF across language for the item home access was found to be caused by differences in the wording of the items.

At first glance, item-person matching appeared suboptimal in that approximately 23% of the sample experienced fewer environmental barriers than could be assessed by the questionnaire. Although this finding may suggest insensitivity and thereby question the construct validity of the Nottwil Environmental

Factors Inventory Short Form, our comparative data analysis suggests that this finding is more likely to be the result of the relatively high level of functioning of the study population, which included many participants with incomplete SCI.

Although this assumption is supported by a subgroup comparison of persons showing a floor effect, it is also conceivable that the findings reflect successful efforts to achieve an accessible and barrier-free environment in Switzerland.

Study limitations

Several limitations of this study need to be mentioned. It is conceivable that unit nonresponse (ie, participants that were contacted but did not return the survey) was related to environmental barriers (eg, difficulties with communication devices). It cannot be ruled out that the sample may not be representative of the total Swiss population with SCI for the perceived impact of environmental barriers on participation. One may also criticize the Nottwil Environmental Factors Inventory Short Form, similar to the Craig Hospital Inventory of Environmental Factors,^{6,28} for merely measuring perceived barriers. Another criticism is that there will obviously be a relation between the person's functional ability and his/her perception of barriers. However, this is not a 1:1 relation. Characteristics of the environment, ambition to participate, ability to find strategies to overcome barriers, and other factors all will influence the perception of environmental barriers. Although objective measurement may best characterize physical barriers in the environment, measurement of the perception of barriers by the person directly relates to participation and is in many circumstances the only way to evaluate relevant environmental barriers.

Although the Craig Hospital Inventory of Environmental Factors asks respondents to report the frequency of encountering barriers and the size of the problem, the Nottwil Environmental Factors Inventory Short Form more directly asks for the perceived impact on their life.

Despite the aforementioned limitations, we would like to point out several strengths of this study. First, the Nottwil Environmental Factors Inventory Short Form was developed in a comprehensive process involving researchers, clinical experts, and persons with SCI. The set of items is expected to have content validity and be able to address a significant range of environmental factors with a perceptible impact on the daily lives of persons with SCI. Second, the Rasch analysis with a PCM is an appropriate approach when the responses are ordinal and the relative distances between consecutive thresholds not expected to be equal across items. Finally, the analysis was performed on a large sample of 1549 persons for 14 items with 3 response options;

therefore, the findings can be expected to be robust and reproducible.

Conclusions

The Nottwil Environmental Factors Inventory Short Form showed good construct validity and internal consistency, supporting the use of the Nottwil Environmental Factors Inventory Short Form to evaluate environmental barriers to social participation in persons with SCI living in the community.

Supplier

a. R package.; R Core Team. Available at: <http://www.R-project.org/>.

Keywords

Environment; International Classification of Functioning, Disability and Health; Psychometrics; Rehabilitation; Social participation; Spinal cord injuries

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Acknowledgments

We thank Bernd Fellinghauer, PhD, Wolfgang Segerer, Veronika Lay, and Cristina Bostan for support with technical and methodologic questions.

The members of the SwiSCI Steering Committee are as follows: Olivier Dériaz (Clinique Romande de Réadaptation, Sion); Michael Baumberger and Hans Peter Gmünder (Swiss Paraplegic Center, Nottwil); Armin Curt and Martin Schubert (University Clinic Balgrist, Zürich); Margret Hund-Georgiadis and Kerstin Hug (REHAB Basel, Basel); Hans Georg Koch and Urs Styger (Swiss Paraplegic Association, Nottwil); Hardy Landolt (Representative of Persons with SCI, Glarus); Hannjörg Koch (SUVA, Luzern); Mirjam Brach and Gerold Stucki (Swiss Paraplegic Research, Nottwil); and Martin Brinkhof and Christine Thyrian (SwiSCI Study Center at Swiss Paraplegic Research, Nottwil).

Appendix

Appendix 1 Nottwil Environmental Factors Inventory Short Form

Introduction

In daily life, one is exposed to diverse external influences (so-called environmental factors), which can make everyday easier or more difficult.

Which factors made your participation in society a little, or considerably more, difficult in the last 4 weeks? Please consider how you would like your participation to be.

Question No.	Label	Question	Response Options
1	Public access	Inaccessible or inadequately accessible public places (eg, public buildings, parks)	0 = no influence 1 = made my life a little harder 2 = made my life a lot harder
2	Climate	Unfavorable climatic conditions (eg, weather, season, temperature, humidity)	0 = no influence 1 = made my life a little harder 2 = made my life a lot harder
3	Social attitudes	Negative societal attitudes toward persons with disability (eg, prejudice, ignorance)	0 = no influence 1 = made my life a little harder 2 = made my life a lot harder
4	Attitudes of family	Negative attitudes of your family and relatives with regard to your disability (eg, prejudice, lack of support, overprotective behavior)	0 = no influence 1 = made my life a little harder 2 = made my life a lot harder
5	Attitudes of friends	Negative attitudes of your friends with regard to your disability (eg, prejudice, lack of support, overprotective behavior)	0 = no influence 1 = made my life a little harder 2 = made my life a lot harder
6	Attitudes of colleagues	Negative attitudes of neighbors, acquaintances, and work colleagues with regard to your disability (eg, prejudice, lack of support, overprotective behavior)	0 = no influence 1 = made my life a little harder 2 = made my life a lot harder
7	Short-distance transportation	Lack of, or inadequate, adapted assistive technology for moving around over short distances (eg, stair lift, walking aids)	0 = no influence 1 = made my life a little harder 2 = made my life a lot harder
8	Long-distance transportation	Lack of, or inadequate, adapted means of transportation for long distances (eg, no adapted car, hard to use public transport)	0 = no influence 1 = made my life a little harder 2 = made my life a lot harder
9	Personal care assistance	Lack of, or inadequate, nursing care and support services (eg, home health care, personal assistance)	0 = no influence 1 = made my life a little harder 2 = made my life a lot harder
10	Medical supplies	Lack of, or insufficient, medication and medical aids and supplies (eg, catheters, disinfectants, splints, pillows)	0 = no influence 1 = made my life a little harder 2 = made my life a lot harder
11	Financial situation	Problematic financial situation (eg, shortage of money, lack of governmental support)	0 = no influence 1 = made my life a little harder 2 = made my life a lot harder
12	Communication devices	Lack of, or inadequate, communication devices (eg, writing devices, computer, telephone, mouse)	0 = no influence 1 = made my life a little harder 2 = made my life a lot harder
13	Home access	Inaccessibility, or inadequate, accessibility to the homes of friends and relatives	0 = no influence 1 = made my life a little harder 2 = made my life a lot harder
14	Political decisions	Inadequate national and cantonal political decisions and governmental services (eg, problems with disability insurance, lack of equality promotion)	0 = no influence 1 = made my life a little harder 2 = made my life a lot harder

Appendix 2 Nottwil Environmental Factors Inventory Short Form raw score conversion table

Raw Score	Rasch Ability	0–100 Score
0	−4.28	0
1	−3.35	12
2	−2.49	23
3	−1.94	30
4	−1.52	36
5	−1.19	40
6	−0.90	44
7	−0.64	47
8	−0.41	50
9	−0.19	53
10	0.02	56
11	0.22	58
12	0.41	61
13	0.61	63
14	0.81	66
15	1.01	69
16	1.22	71
17	1.45	74
18	1.70	78
19	1.99	81
20	2.34	86
21	2.70	91
22	3.06	95
23	3.42	100

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