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Cross-Cultural Adaptation of a German Version of the Oswestry Disability Index and Evaluation of Its Measurement Properties

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Study Design. Psychometric testing of a translated, culturally adapted questionnaire.

Objectives. Cross-cultural adaptation of a German version of the Oswestry Disability Index (ODI) and evaluation of its measurement properties.

Summary of Background Data. The ODI, one of the most popular questionnaires for chronic low back pain (LBP), has been valid, reliable, and responsive. Recently, a Swiss version of the ODI has been published, but there is no validated version for Germany to date.

Methods. The translated and adapted German version of the ODI (ODI-G) was validated in inpatients with chronic LBP during 3 weeks' medical rehabilitation care. The ODI-G was completed at admission, 1 day later, and at discharge. Comparison with both a generic and chronic LBP-specific measure (the SF-36 and Hannover Functional Ability Questionnaire) assessed criterion validity.

Results. A very high level of test-retest-reliability was found (r = 0.91). Criterion validity showed high correlations between the ODI-G on 1 side, and the SF-36 and Hannover Functional Ability Questionnaire on the other. Standardized response means showed significant changes when health status improved (1.38) or deteriorated (1.35).

Conclusions. The ODI-G is valid, reliable, and responsive. It may be used to measure current state as well as changes in health status, and allows for cross-cultural comparisons. Further research comparing the 2 versions in German language seems to be necessary.

Key words: chronic pain, low back pain, outcome measurement, rehabilitation. **Spine 2006;31:E448–E453**

There are several condition-specific outcome measures for low back pain (LBP).[1–9] Yet, one of the most popular questionnaires throughout the world seems to be the Oswestry Disability Index (ODI). It is widely applied in medical studies. In regard to the patient population, the ODI has been used in acute and chronic LBP.[10] Furthermore, it has been applied for evaluating outcome of different interventions, like Acupuncture and Manipulation,[11] Back School,[12] Functional Restoration Programme and Outpatient Physiotherapy,[13] Occupational Rehabilitation,[14] Work Rehabilitation Program,[15] Pain Management Programme[16] and after surgery,[17] to name only a few.

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Moreover, having proved to be a valuable diagnostic tool in terms of validity,[18,19] reliability,[1,8,20] and responsiveness,[21] the ODI served as a criterion for validating other instruments.[22–25] It was also successfully taken as a model for measuring LBP in other languages (*e.g.*, there is a Norwegian, Korean, Greek, and Arabic version of the ODI 2.0).[26–29] Focusing not only on impairment, but also on disability and handicap, the ODI fits the demands of the International Classification of Functioning, Disability and Health, and the International Classification of Impairment, Disability and Handicap, respectively.

For all these reasons, use of the ODI has been recommended in various German guidelines for different back pain disorders,[30] but, to our knowledge, no validated version has been published in Germany to date. There have been simultaneous efforts to create and evaluate a "German ODI" in Switzerland that were successful recently (see Discussion).[31] The aim of our study was to develop a reliable and valid German version of the ODI 2.0. It will be called "ODI-German" (ODI-G) in this article.

Methods

Subjects and Setting. All 160 inpatients included in the study completed baseline questionnaires. They had chronic conditions of LBP and underwent 3 weeks' medical rehabilitation care (German spa system) in the rehabilitation-center Bad Wurzach, Germany, in spring 2003. Questionnaires were readministered 1 day after admission for evaluating reliability (158 patients) and at discharge for responsiveness (141). These repeat questionnaires included a so-called transition question asking patients whether there had been any change in their health status in the meantime. The age of the patients ranged from 24.4 to 63.0 years (mean 47.5, standard deviation [SD] 9.0). Of the patients, 27% were female.

The Original ODI. There are 4 versions of the original English questionnaire[32]:

1. Version 1.0: The original[1]
2. Version 2.0: Modified by the Medical Research Council research group.[33] The main differences are that the first question of the original was modified so that it refers to pain intensity rather than any mention of painkillers, and the time scale was specified as "today."
3. AAOS/MODEMS Version[34]
4. Chiropractic "Revised Oswestry pain questionnaire"[35]

Differences in the content and scoring of the different versions have confused the interpretation of studies. The use of version 2.0[32,36] is recommended (Appendix). Although the investigators claim to have used version 2.0, there is still some small difference regarding 1 of the response options in question No. 4: half a mile

(Fairbank and Pynsent[32]) *versus* a quarter of a mile (Roland and Fairbank[36]). Considering necessary transformations into the metric system applied in Germany, our choice was closer to Roland and Fairbank[36] (half a kilometer; see Discussion).

Translating and Adapting the Questionnaire. There were 5 German native speakers independent of each other who translated the English version. The translators discussed these translations to get a consent version, which the medical staff examined concerning face validity. After minor changes, the final version was to be evaluated with respect to validity, reliability, and responsiveness. The development of the German version followed largely the recommendations of cross-cultural adaptations of health-related quality of life measures and self-report measures,[37,38] except that back-translation was renounced because the meaning of the questions appeared unmistakable after first discussed by the translators and examination by the medical staff.

Testing the Questions. Items to remain in the questionnaire were to fulfill 3 statistical criteria:

1. Response frequency (frequency of endorsement): The proportion of patients giving the same response to a question should be less than 80%. Otherwise, the question would not be sensitive enough to discriminate between different levels of severity.
2. Homogeneity of the items: Item-total-correlations (Pearson correlations) are used to measure the relationship between each item and the total score omitting the item. Questions with item-total correlations less than 0.3 were regarded as not suitable.[39]
3. Principal Component Analysis: The eigenvalue criterion determined dimensions of back-related health. Only factors with eigenvalues ≥1 were accepted. An item judged suitable had to reach a factor loading of at least 0.4.

Testing the Final Version of the ODI-G

Reliability. The Cronbach-α was used to measure internal consistency,[40] which should be higher than 0.70,[41] but not much higher than 0.90 to avoid redundancy. The Cronbach-α was calculated for the total score and each item of the ODI-G. For retest reliability, the ODI-G was administered at admission and 1 day later. This time span is in line with the evaluation of the original English version of the ODI.[1]

There was yet 1 important difference in the normal proceeding. A transition question was used asking the patient whether his/her health status had improved, remained the same, or got worse during the time span until "retest." Only patients reporting no changes were included in the test-retest analysis.

Validity. Criterion validity of the definitive questionnaire was assessed by comparing the baseline scores with both the Hannover Functional Ability Questionnaire (FFbH-R),[42] a condition-specific questionnaire measuring back pain-related disability, and a generic outcome measure, the SF-36 profile,[43,44] which measures health across 3 dimensions and includes 8 separate scales (Table 1).

Responsiveness (sensitivity toward change). An outcome measure of health status should detect treatment effects and, therefore, be sensitive or responsive to a clinically significant change. The standardized response mean (SRM) was used to measure responsiveness[21,45]:

$$\frac{\text{Score of patients with health status improved (deteriorated)}}{\text{SD of patients with health status improved (deteriorated)}}$$

Baseline scores were compared with final scores. If health status had either "deteriorated" or "improved," the numerator of this statistic was the mean change in score. The denominator was the SD of the individuals' changes in scores. The SRM statistic was calculated separately for health status improved or deteriorated. A SRM of 0.2 was considered a small change, 0.5 moderate, and ≥0.8 a large change.[46] Data analysis was performed using the SAS System for Windows (release 8.02, NT Version; SAS Institute Inc., Cary, NC).

Table 1. Correlations of the ODI-G With the 8 Scales of the SF-36 and the Specific Outcome Measure FFbH-R (N = 80)

	ODI-G
SF-36	
PFI	−0.78
ROLPH	−0.59
Pain	−0.72
General health perception	−0.62
Vital	−0.65
Social	−0.58
ROLEM	−0.48
MHI	−0.52
FFbH-R	−0.80

$P < 0.0001$.
MHI indicates; PFI; ROLEM; ROLPH.

■ Results

Testing the Items

All items fulfilled the criteria of maximum response frequency, item-total correlation, and principal component analysis (Table 2). Obviously, there is no ceiling effect, the items cohere and load substantially on the factors,

Table 2. Selection of Questions for ODI-G: Items Meeting the Entrance Criteria

Item	Maximum Response Frequency (<80%)	Item-Total Correlation ≥0.3	Principal Component Coefficients ≥0.4	
			F1	F2
Pain intensity	52	0.63		0.67
Personal care	65	0.58		0.83
Lifting	33	0.61	0.60	
Walking	49	0.60	0.60	
Sitting	40	0.64	0.79	
Standing	42	0.58	0.87	
Sleeping	56	0.60		0.66
Sex life	51	0.62		0.80
Social life	37	0.60	0.41	0.55
Traveling	50	0.72	0.71	0.41

Table 3. Classification of Patients Concerning the Severity of Disability

No. Patients at Admission	Group No.	Score (%)	Severity
59	1	0–20	Minimal disability
73	2	>20–40	Moderate disability
24	3	>40–60	Severe disability
4	4	>60–80	Crippled back pain
0	5	>80 to −100	Either bed bound or exaggerating symptoms

Table 4. Mean Change and SRM for the ODI-G and FFbH-R When Health Status Improved or Deteriorated*

	ODI-G	FFbH-R
Health status improved (N = 38)		
Mean change (SD)	10.46 (7.56)	13.17 (10.07)
SRM	1.38	1.30
Health status deteriorated (N = 21)		
Mean change (SD)	7.00 (5.21)	−13.04 (7.68)
SRM	1.35	1.70

*A SRM of 0.2 is considered a small change, 0.5 moderate, and ≥0.8 a large change.

with the latter being interpretable as "pain-related disability" and "pain-related handicap."

Distribution of Baseline Scores

Adding the scores of each of the 10 sections (0–5 for each section) in the questionnaire, dividing this sum by the maximal possible score (*e.g.*, 50 if all 10 sections are completed, 45 if 1 section is missed), and converting this fraction into a percentage is performed for scoring.

$$\frac{(\text{Score Item 1} + \text{Score Item 2} + \cdots\cdots + \text{Score Item 10}) \times 100}{\text{Maximal Score of the Items}}$$

The baseline scores are distributed in such a way that they cover almost the whole range of the scale, but their distribution is not normal. The scores (percent) can be sorted into groups (Table 3) that represent different degrees of severity.[1] This classification system has not been validated up until now. Scores higher than 80% were not obtained. Therefore, no patient is found in group 5. The mean score of the baseline distribution was 27.5% (SD 14.6), which indicates a moderate disability of the patients at admission.

Evaluation of the Definitive Questionnaire

Testing for Reliability

Internal Consistency. The Cronbach-α for the final questionnaire was 0.89, which means that all parts of the questionnaire are highly homogeneous.

Test-Retest Reliability. Of the 160 patients, 158 filled in both the baseline and retest questionnaires. A total of 133 patients reported no changes in health status according to the transition question. Retest coefficients were significant and high, ranging from rtt = 0.68 (item: "Social Life") to rtt = 0.80 (item: "Sitting"), and reaching rtt = 0.91 for the total score.

Testing for Validity. Construct validity is supported by factor analysis finding evidence of plausible factor structures underlying the items. According to the International Classification of Impairment, Disability and Handicap, and International Classification of Functioning, Disability and Health, factors 1 and 2 could be entitled "pain-related activity" and "pain intensity and pain-related participation" or "pain-related disability" and "pain intensity and pain related handicap," depending on which classification one prefers (Table 2). The 2 factors emerging from the Principal Component Analysis explain 30.5% and 30.2% of the total variance of the scores.

Criterion Validity. Total scores of the baseline questionnaires were compared with the FFbH-R and the 8 scales of the SF-36 (Table 1). The scores of the ODI-G achieved highly significant negative correlations both with the total score of the FFbH-R and with the scales of the SF-36 health profile, thereby confirming the validity of the ODI-G. Health scores of the latter decrease with less pain and disability, whereas those of the other 2 questionnaires rise with increasing health status, which, in fact, accounts for the negative sign of the correlations.

Responsiveness. The SRM showed large changes for both the ODI-G and FFbH-R when health status improved (1.38 *vs.* 1.30) and deteriorated (1.35 *vs.* 1.70, respectively; Table 4). The SRM of the ODI-G is slightly higher than that of the FFbH-R when health status improved and lower when health status deteriorated.

■ Discussion

The purpose of the present study was to construct and evaluate a German version of the ODI. Translating the original version did not present any problem. For the vast majority of questions, dealing with simple activities and participation, no doubt, seems warranted about their meaning in either language. Divergence among the translations of the 5 native German speakers was only minor, which may be because of the clear and simple structure of the original as to medical content and wording. Thus, as recommended by some investigators,[37,47] retranslation seemed dispensable.

Necessary modifications in the first instance refer to the specifications of distance in question No. 4. For 1 mile, ½ mile, and 100 yards in the ODI, we took 2 km (1.25 miles), 500 m (0.31 miles), and 100 m (111 yards), which we thought would offer better discrimination of walking ability in a German questionnaire. Yet, this gradation is arbitrary, and some means or another may be mistaken. Germans are ignorant of what a mile or a yard is. Instead, they are used to estimating distances in meters and kilometers. Thus, transforming the aforementioned miles and yards strictly into the equivalent kilometers and meters would appear strange to the subjects because walking 1600, 800, or 90 m is an unusual notion for Germans.

On the other hand, by using the familiar German distances, the underlying physical continua of the English original and German translation will differ from each other. For example, to make the distances plausible for Germans, we extended the distance of 1 mile from 1600 to 2000 m and

diminished the distance of ½ mile by 300 m, thereby broadening the difference between levels 4 and 5 of the question by 700 m (*i.e.*, ticking level 4 or 5 in this item means more actual difference in walking capacity than in the English original, which should be kept in mind when it comes to cross-cultural comparisons). However, the difference of 100 yards and 100 m seems negligible.

The equivalent of "traveling" (in German: "Reisen") does not include shorter journeys undertaken (*e.g.*, to see the physician). Therefore, "Fahrten" complemented "Reisen," which refers to journeys of short duration. There is a certain discrepancy concerning the question about self care. Response category No. 3 ("It is painful to look after myself and I am slow and careful") does not seem a true progression of response category No. 2 ("I can look after myself normally but it is very painful") by first indicating it is "very painful," and afterwards it is only "painful." We did not correct this point because we did not realize it during the translation process. Fortunately, this lapse shared by both versions will at least not compromise cross-cultural comparability.

Apart from the problems just mentioned, there was unanimous consent in the staff about the equivalence of the English version and its German translation. Achieving a response rate of 100% at baseline and 1 day later and 99.3% at discharge, the German version, as a whole, was comprehensible and readily accepted by the patients. However, 20 patients seemed to object to item No. 8, refusing to respond to the question of how LBP interferes with their sex life. This is in line with the observation that the "sex question" is unacceptable in some cultures and has been omitted in some studies.[32] Still, the response rate to question No. 8 in the ODI-G seems to be sufficient.

Owing to a coefficient of the Cronbach-α of 0.89, which even exceeds the score of the English version (0.76),[18] the ODI-G meets the criteria required for differentiating between patients. High correlations between the baseline and retest questionnaires (rtt = 0.93) represent a very high level of test-retest reliability, allowing for clinical use. In the present study, the retest questionnaire had been administered after only 1 day. Fairbank *et al*[1] found an even higher score (0.99) for the 24-hour interval. It could be argued that particularly the latter result might overestimate reliability because of too short a time span between the 2 measurements. Yet, we consider it unlikely that our patients recalled their answers given 1 day before, particularly because there was much new information concerning clinic life that had to be kept in mind.

Moreover, several questionnaires with many items had been administered at the same time,[48] which may have had a confusing effect on the patients, preventing them to remember their former answers to the questions of the ODI. Perhaps, this fact also explains why our retest score falls short of that of Fairbank *et al*,[1] by about 12% in terms of explained variance. When the retest interval is extended to 4 or 7 days, the retest scores decrease to 0.91 or 0.83, respectively,[8,20] which may be caused by a change of health status during this interval.

High correlations between the total score of the ODI-G on the one hand and the 8 scales of the generic outcome measure SF-36, as well as the total score of the specific measure FFbH-R on the other, confirm high criterion validity and suggest that the ODI-G actually measures LBP in the same way as the original English version. The ODI correlates with the SF-36, too.[19,49] The SRMs for the ODI-G indicated remarkable changes both when health status improved and deteriorated. Thus, deterioration as well as improvement can be measured with high precision, which, in fact, is very important for judging therapeutic interventions.

Overall, the ODI-G is easy to conceive, quick to complete, highly accepted, and allows patients to grade limitations of activity and participation. Because of its easy scoring, high sensitivity toward change, and wide acceptance by patients, the ODI-G can be recommended for clinical trials investigating the effectiveness of a therapeutic regimen as well as outcome measurement in LBP in a clinical routine. Furthermore, showing good correspondence with the English original as to wording and statistical tests, the German version of the ODI, as a consequence, allows for intercultural comparisons, which is especially interesting because the ODI is widely used in studies all over the world. There is still another German version validated for Swiss patients that had not been published until April 2005.[31] Because both "German ODIs" claim to be valid for German-speaking lands, a direct comparison may be necessary to tell whether both can be used as independent questionnaires, 1 for Germany and the other for Switzerland, or one may replace the other.

■ Key Points

- One of the most popular questionnaires for assessing LBP-related health status and disability throughout the world, the ODI has been valid, reliable, and responsive.
- The development of a German version of the ODI largely followed the recommendations of cross-cultural adaptations of health-related quality of life measures and self-report measures.
- Just like the original, the ODI-G has been valid, reliable, and responsive.
- It is an adequate tool for measuring status and outcome, and allows for intercultural comparisons.

References

1. Fairbank JCT, Couper J, Davies JB, et al. The Oswestry low back pain disability questionnaire. *Physiotherapy* 1980;66:271–3.
2. Million R, Hall W, Nilsen KH, et al. Assessment of the progress of the back pain patient. *Spine* 1982;7:204–12.
3. Roland M, Morris R. A study of the natural history of back pain. Part 1: Development of a reliable and sensitive measure of disability in low back pain. *Spine* 1983;8:141–3.
4. Waddell G, Main CJ. Assessment of severity in low-back disorders. *Spine* 1984;9:204–8.

5. Lawlis GF, Cuencas R, Selby D, et al. The development of the Dallas pain questionnaire. An assessment of the impact of spinal pain on behavior. *Spine* 1989;14:510–6.
6. Greenough CG, Fraser RD. Assessment of outcome in patients with low back pain. *Spine* 1992;17:36–41.
7. Ruta DA, Garrat AM, Wardlaw D, et al. Developing a valid and reliable measure of health outcome for patients with low-back pain. *Spine* 1994;19: 1887–96.
8. Kopec JA, Esdaile JM, Abrahamovicz M, et al. The Quebec back pain disability scale: Conceptualization and development. *J Clin Epidemiol* 1996;20: 151–61.
9. Tesio L, Granger CV, Fiedler RC. A unidimensional pain/disability measure for low-back pain syndromes. *Pain* 1997;69:269–78.
10. Grotle M, Vollestad NK, Veierod MB, et al. Fear-avoidance beliefs and distress in relation to disability in acute and chronic low back pain. *Pain* 2004;112:343–52.
11. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. *J Manipulative Physiol Ther* 2005;28:3–11.
12. Loisel P, Abenhaim L, Durand P, et al. A population-based, randomized clinical trial on back pain management. *Spine* 1997;22:2911–8.
13. Frost H, Lamb SE, Doll HA, et al. Randomised controlled trial of physiotherapy compared with advice for low back pain. *BMJ* 2004;329:708.
14. Cooper JE, Tate RB, Yassi A, et al. Effect of an early intervention program on the relationship between subjective pain and disability measures in nurses with low back injury. *Spine* 1996;21:2329–36.
15. Baker P, Goodman G, Ekelman B, et al. The effectiveness of a comprehensive work hardening program as measured by lifting capacity, pain scales, and depression scores. *Work* 2005;24:21–31.
16. Luscombe FE, Wallace L, Williams J, et al. A district-general hospital pain management programme–First year experiences and outcomes. *Anaesthesia* 1995;50:114–7.
17. Putzier M, Schneider SV, Funk JF, et al. The surgical treatment of the lumbar disc prolapse: Nucleotomy with additional transpedicular dynamic stabilization versus nucleotomy alone. *Spine* 2005;30:E109–14.
18. Fisher K, Johnson M. Validation of the Oswestry low back pain disability questionnaire, its sensitivity as a measure of change following treatment and relationship with other aspects of the chronic pain experience. *Physiother Theory Pract* 1997;13:67–80.
19. Grevitt M, Khazim R, Webb J, et al. The short form-36 health survey questionnaire in spine surgery. *J Bone Joint Surg Br* 1997;79:48–52.
20. Gronblad M, Hupli M, Wennerstrand P, et al. Intercorrelation and test-retest reliability of the Pain Disability Index (PDI) and the Oswestry Disability Questionnaire (ODQ) and their correlation with pain intensity in low back pain patients. *Clin J Pain* 1993;9:189–95.
21. Beurskens AJ, de Vet HC, Koke AJ. Responsiveness of functional status in low-back pain: A comparison of different instruments. *Pain* 1996;65:71–6.
22. Bridwell KH, Cats-Baril W, Harrast J, et al. The validity of the SRS-22 instrument in an adult spinal deformity population compared with the Oswestry and SF-12: A study of response distribution, concurrent validity, internal consistency, and reliability. *Spine* 2005;30:455–61.
23. Anagnostis C, Gatchel RJ, Mayer TG. The pain disability questionnaire: A new psychometrically sound measure for chronic musculoskeletal disorders. *Spine* 2004;29:2290–302.
24. Fritz JM, Piva SR. Physical impairment index: Reliability, validity, and responsiveness in patients with acute low back pain. *Spine* 2003;28:1189–94.
25. Manniche C, Asmussen K, Lauritsen B, et al. Low Back Pain Rating scale: Validation of a tool for assessment of low back pain. *Pain* 1994;57:317–26.
26. Grotle M, Brox JI, Vøllestad NK. Cross-cultural adaptation of the Norwegian versions of the Roland-Morris Disability Questionnaire and the Oswestry Disability Index. *J Rehabil Med* 2003;35:241–7.
27. Kim DY, Lee SH, Lee HY, et al. Validation of the Korean version of the Oswestry disability index. *Spine* 2005;30:E123–7.
28. Boscainos PJ, Sapkas G, Stilianessi E, et al. Greek versions of the Oswestry and Roland-Morris Disability Questionnaires. *Clin Orthop Relat Res* 2003; 411:40–53.
29. Guermazi M, Mezghani M, Ghroubi S, et al. The Oswestry index for low back pain translated into arabic and validated in a Arab population [in French]. *Ann Readapt Med Phys* 2005;48:1–10.
30. Dt. Ges. f. Orthopädie und orthopäd. Chirurgie + BV d. Δrzte f. Orthopädie. Available at: http://www.dgooc.de/Leitlinien.php?M=5.
31. Mannion AF, Junge A, Fairbank JC, et al. Development of a German version of the Oswestry Disability Index. Part 1: Cross-cultural adaptation, reliability, and validity. *Eur Spine J* 2005;15:55–65.
32. Fairbank JC, Pynsent PB. The Oswestry Disability Index. *Spine* 2000;25: 2940–52.
33. Meade T, Browne W, Mellows S, et al. Comparison of chiropractic and hospital outpatient management of low-back pain–A feasibility study. *J Epidemiol Community Health* 1986;40:12–7.
34. Daltroy LH, Cats-Baril WL, Katz JN, et al. The North American Spine Society lumbar spine outcome assessment instrument: Reliability and validity tests. *Spine* 1996;21:741–9.
35. Hudson-Cook N, Tomes-Nicholson K, Breen A. A revised Oswestry disability questionnaire. In: Roland M, Jenner JR, eds. *Back Pain: New Approaches to Rehabilitation and Education*. Manchester, UK: Manchester University Press; 1989:187–204.
36. Roland M, Fairbank J. The Roland-Morris Disability Questionnaire and the Oswestry Disability Questionnaire. *Spine* 2000;25:3115–24.
37. Guillemin F, Bombardier C, Beaton D. Cross-cultural adaptation of health-related quality of life measures: Literature review and proposed guidelines. *J Clin Epidemiol* 1993;46:1417–32.
38. Beaton DE, Bombardier C, Guillemin F, et al. Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine* 2000;15;25: 3186–91.
39. Lienert GA, Raatz U. *Testaufbau und Testanalyse (5. Aufl.)*. Weinheim, München, Germany: Psychologie Verlags Union; 1991.
40. Cronbach LJ. Coefficient alpha and the internal structure of tests. *Psychometrika* 1951;16:297–334.
41. Nunnally JC. *Psychometric Theory*. 2nd ed. New York, NY: McGraw-Hill; 1978.
42. Kohlmann T, Raspe H. Hannover Functional Questionnaire in ambulatory diagnosis of functional disability caused by backache [in German]. *Rehabilitation (Stuttg)* 1996;35:1–8.
43. Ware JE, Sherbourne CD. The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. *Med Care* 1992;30:473–83.
44. Bullinger M. German translation and psychometric testing of the SF-36 Health Survey: Preliminary results from the IQOLA Project. International Quality of Life Assessment. *Soc Sci Med* 1995;41:1359–66.
45. Guyatt GH, Walter S, Norman GR. Measuring change over time: Assessing the usefulness of evaluative instruments. *J Chronic Dis* 1987;40:171–8.
46. Cohen J. *Statistical Power Analysis for the Behavioural Sciences*. New York, NY: NY Press; 1977.
47. Bullinger M, Alonso J, Apolone G, et al. Translating health status questionnaires and evaluating their quality: The IQOLA Project approach. International Quality of Life Assessment. *J Clin Epidemiol* 1998;51:913–23.
48. Osthus H, Cziske R, Jacobi E. A German version of the Extended Aberdeen Back Pain Scale: development and evaluation. *Spine* 2006;31:571–7.
49. Taylor S, Taylor A, Foy M, et al. Responsiveness of common outcome measures for patients with low back pain. *Spine* 1999;24:1805–12.

■ Appendix

Wir möchten Sie bitten, diesen Fragebogen auszufüllen.

Er ist dazu bestimmt uns Informationen darüber zu geben, wie Ihr Rückenschmerz (oder die Ausstrahlung in die Beine) sich auf Ihre tägliche Lebensführung auswirkt.

Bitte beantworten Sie **in jedem Abschnitt eine Frage**.

Falls mehrere Antworten auf Sie zutreffen, kreuzen Sie in jedem Abschnitt bitte nur die eine Antwort an, die ***heute*** am besten auf Sie zutrifft.

Abschnitt 1 – Schmerzstärke

- □ Ich habe im Moment keine Schmerzen.
- □ Ich habe im Moment sehr geringe Schmerzen.
- □ Ich habe im Moment mittelmäβige Schmerzen.
- □ Ich habe im Moment ziemlich starke Schmerzen.
- □ Ich habe im Moment sehr starke Schmerzen.
- □ Ich habe im Moment die stärksten vorstellbaren Schmerzen.

Abschnitt 2 – Körperpflege (Waschen, Anziehen usw.)

- □ Ich kann mich um mich selbst kümmern, ohne zusätzliche Schmerzen zu bekommen.
- □ Ich kann mich um mich selbst kümmern, aber es ist sehr schmerzhaft.

- ☐ Meine Körperpflege ist schmerzhaft und ich bin dabei langsam und vorsichtig.
- ☐ Ich brauche etwas Hilfe, kann aber meine Körperpflege überwiegend selbst durchführen.
- ☐ Ich brauche jeden Tag Hilfe in den meisten Bereichen der eigenen Körperpflege.
- ☐ Ich kann mich nicht selbst anziehen, nur mit Schwierigkeiten waschen und bleibe meistens im Bett liegen.

Abschnitt 3 – Heben

- ☐ Ich kann schwere Gewichte heben, ohne zusätzliche Schmerzen zu bekommen.
- ☐ ich kann schwere Gewichte heben, aber dies verursacht zusätzliche Schmerzen.
- ☐ Wegen Schmerzen kann ich schwere Gewichte nicht vom Boden heben. Ich kann sie aber heben, wenn sie günstig stehen, z.B. auf einem Tisch.
- ☐ Wegen Schmerzen kann ich schwere Gewichte gar nicht heben. Ich kann aber leichte bis mittelschwere Gewichte heben, wenn sie günstig stehen.
- ☐ Wegen Schmerzen kann ich nur sehr leichte Gewichte heben.
- ☐ Wegen Schmerzen kann ich überhaupt nichts heben oder tragen.

Abschnitt 4 – Gehen

- ☐ Ich kann beliebig weit gehen, ohne zusätzliche Schmerzen zu bekommen.
- ☐ Wegen Schmerzen kann ich nicht weiter als 2 km gehen.
- ☐ Wegen Schmerzen kann ich nicht weiter als 500 m gehen.
- ☐ Wegen Schmerzen kann ich nicht weiter als 100 m gehen.
- ☐ Wegen Schmerzen kann ich nur mit einem Stock oder Unterarmgehhilfen (Krücken) gehen.
- ☐ Wegen Schmerzen liege ich die meiste Zeit im Bett und komme nur "auf allen Vieren" zur Toilette.

Abschnitt 5 – Sitzen

- ☐ Ich kann auf jedem Stuhl solange sitzen, wie ich will.
- ☐ Ich kann nur auf meinem Lieblingsstuhl solange sitzen, wie ich will.
- ☐ Wegen Schmerzen kann ich nicht länger als 1 Stunde sitzen.
- ☐ Wegen Schmerzen kann ich nicht länger als 30 Minuten sitzen.
- ☐ Wegen Schmerzen kann ich nicht länger als 10 Minuten sitzen.
- ☐ Wegen Schmerzen kann ich überhaupt nicht mehr sitzen.

Abschnitt 6 – Stehen

- ☐ Ich kann solange stehen, wie ich will, ohne zusätzliche Schmerzen zu bekommen.
- ☐ Ich kann solange stehen, wie ich will, aber dies verursacht zusätzliche Schmerzen.
- ☐ Wegen Schmerzen kann ich nicht länger als 1 Stunde stehen.
- ☐ Wegen Schmerzen kann ich nicht länger als 30 Minuten stehen.
- ☐ Wegen Schmerzen kann ich nicht länger als 10 Minuten stehen.
- ☐ Wegen Schmerzen kann ich überhaupt nicht mehr stehen.

Abschnitt 7 – Schlaf

- ☐ Mein Schlaf wird nie durch Schmerzen gestört.
- ☐ Mein Schlaf wird manchmal durch Schmerzen gestört.
- ☐ Wegen Schmerzen schlafe ich weniger als 6 Stunden.
- ☐ Wegen Schmerzen schlafe ich weniger als 4 Stunden.
- ☐ Wegen Schmerzen schlafe ich weniger als 2 Stunden.
- ☐ Wegen Schmerzen kann ich überhaupt mehr nicht schlafen.

Abschnitt 8 – Sexualleben

- ☐ Mein Sexualleben ist normal und verursacht keine zusätzlichen Schmerzen.
- ☐ Mein Sexualleben ist normal, verursacht aber leichte zusätzliche Schmerzen.
- ☐ Mein Sexualleben ist fast normal, verursacht aber starke zusätzliche Schmerzen.
- ☐ Wegen Schmerzen ist mein Sexualleben stark beeinträchtigt.
- ☐ Wegen Schmerzen ist mein Sexualleben fast völlig aufgehoben.
- ☐ Wegen Schmerzen habe ich überhaupt kein Sexualleben mehr.

Abschnitt 9 – gesellschaftliches Leben (Geselligkeit, Kontakte mit anderen Menschen, Hobbys, Ausgehen,. . .)

- ☐ Meine gesellschaftliches Leben ist normal und verursacht keine zusätzlichen Schmerzen.
- ☐ Meine gesellschaftliches Leben ist normal, verursacht aber zusätzliche Schmerzen.
- ☐ Schmerz hat keinen wesentlichen Einfluss auf mein gesellschaftliches Leben, abgesehen von anstrengenden Tätigkeiten, z.B. Sport usw.
- ☐ Schmerz hat mein gesellschaftliches Leben eingeschränkt und ich gehe nicht mehr so oft aus.
- ☐ Wegen Schmerzen beschränkt sich mein gesellschaftliches Leben nur noch auf zu Hause.
- ☐ Wegen Schmerzen habe ich überhaupt keinen Kontakt mehr zu anderen Menschen.

Abschnitt 10 – Fahrten/Reisen

- ☐ Ich kann überall hinfahren, ohne zusätzliche Schmerzen zu bekommen.
- ☐ Ich kann überall hinfahren, aber es verursacht zusätzliche Schmerzen.
- ☐ Die Schmerzen sind schlimm, aber ich schaffe noch Fahrten bis zu 2 Stunden.
- ☐ Die Schmerzen erlauben mir nur noch Fahrten, die weniger als 1 Stunde dauern.
- ☐ Die Schmerzen erlauben mir nur noch kurze, notwendige Fahrten unter 30 Minuten Dauer.
- ☐ Wegen der Schmerzen kann ich nur noch Fahrten unternehmen, um behandelt zu werden.