Physiotherapeutic treatment and clinical evaluation of shoulder disorders

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7 TRANSLATION, ADAPTATION AND VALIDATION OF THE SHOULDER RATING QUESTIONNAIRE (SRQ) INTO THE DUTCH LANGUAGE

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Abstract

Objective: To translate and adapt the original English version of the Shoulder Rating Questionnaire (SRQ) into the Dutch language (SRQ-DLV) and evaluate its internal consistency, reliability, validity and responsiveness to clinical changes.

Design: Prospective study

Setting: Outpatient departments of orthopaedics, radiology and physical therapy of an academic and a non-academic hospital.

Subjects: One hundred and seven patients treated for unilateral shoulder disorder (adhesive capsulitis=68, calcifying tendinitis=22, impingement syndrome or rotator cuff tear=17).

Methods: The original SRQ was translated and adapted following international guidelines. The SRQ-DLV was used among other measures of body function and structure, activities and societal participation in order to determine reliability, internal consistency, validity and responsiveness. Assessments were done at baseline and three months after treatment, with the SRQ-DLV being re-administered within one week before the baseline measurement and the start of the treatment for testing reliability.

Results: Cronbach's alpha for internal consistency was 0.89 for the total questionnaire and 0.81, 0.80, 0.72 and 0.84 for the domains pain, daily activities, sports / recreational activities and work, respectively. Test-retest reliability of the SRQ-DLV and its subscales ranged from .63 to .86. The summary score of the SRQ-DLV correlated with measures of shoulder function, daily activities and quality of life. Except for the work subscale of the SRQ-DLV, large effect sizes, reflecting its responsiveness to clinical changes after treatment, were found for both the summary and the subscales scores.

Conclusions: Empirical data support that the SRQ-DLV is a reliable, valid and responsive measure to be used in clinical trials including Dutch patients with various shoulder disorders.

Introduction

Shoulder disorders, such as rotator cuff tendinitis, bursitis and adhesive capsulitis (frozen shoulder) are a common health problem. In the Netherlands, the annual cumulative incidence of shoulder complaints in general practice has been estimated at 14.7/1000 patients/year, with a peak in the middle years of adulthood (45-64 years). [1] Ten percent of all referrals for physical therapy in the Netherlands concern shoulder disorders.[2] Pain and reduced mobility of the shoulder can affect the patient's daily activities in many ways.

There are many different instruments for the assessment of the shoulder [3] which can roughly be divided into clinical or 'objective' assessments, such as the Constant scale [4] and patient-based or 'subjective' measures, such as the 12 item shoulder questionnaire [5], the Shoulder Pain And Disability Index [6], the Disability Questionnaire [7] and the Shoulder Disability Questionnaire. [8]

Most of the patient-based measures are mainly concerned with pain, range of motion and daily activities such as self-care and household activities. The influence of shoulder disorders on the level of societal participation, such as paid employment, leisure and sports activities is addressed less frequently, despite the fact that these areas may be very relevant in a patient's life. The Shoulder Rating Questionnaire (SRQ) is a self-administered patient-based instrument which not only includes a global assessment, pain, daily activities, areas for improvement and satisfaction, but comprises two additional dimensions: recreational and athletic activities and work. The measurement properties of the SRQ, which have been reviewed among other self-report scales for the assessment of functional limitation and disability of the shoulder, appeared to be sufficient.[3]

Given the comprehensiveness of the SRQ, the objective of this study was to translate and adapt the original English questionnaire into a Dutch language version and evaluate its internal consistency, reliability, validity and responsiveness to clinical change in patients with various shoulder disorders who underwent treatment.

Patients and methods

Translation and adaptation of the SRQ

The SRQ consists of a visual analogue scale (VAS, a horizontal line of 10 centimetres with the extreme limits of response at the left side 'very poorly' and at the right side 'very well') for global assessment of how well patients are doing with respect to their shoulder, and 19 multiple choice questions (scoring from 1 = poorest to 5 = best) concerning 7 subscales. Five subscales are graded separately by averaging the scores of the completed questions, multiplied by two and a weighing factor. The maximum score is 15 points for global assessment (domain score, in centimetres to one decimal place, multiplied by 1.5: range 0-15 points), 40 points for pain (domain score multiplied by

2 and by weighing factor 4: range 8-40 points), 20 points for daily activities (domain score multiplied by 2 and by weighing factor 2: range 4-20 points), 15 points for recreational and athletic activities (domain score multiplied by 2 and by weighing factor 1.5: range 3-15 points) and 10 points for work (domain score multiplied by 2 and by weighing factor 1: range 2-10 points). There are no scores for the subscales satisfaction and areas of improvement. Therefore, the sum score ranges from minimum 17 to maximum 100 points.[9]

According to international guidelines for cross-cultural adaptation of health-related quality of life measures the SRQ was translated and adapted. [10,11] First, three independent translations of the English version of the SRQ into a Dutch version were produced by 3 Dutch physical therapists (GJK, MM, HMV) who were experienced readers of the English language. The three translations were compared and combined into one draft version in Dutch. The most important modification was the example of leisure and sports activities in question 12, where baseball was replaced by playing tennis as this sport is more common in the Netherlands. Secondly, two other independent bilingual translators (LT, SS) with English as their mother tongue were asked to back translate the provisional Dutch version into English. Thirdly, an expert panel consisting of a methodologist (TPMV), a bilingual rheumatologist (JDM) and two physical therapists (GJK and HMV) evaluated the final version of the questionnaire regarding grammatical issues, cultural relevance and content validity for the Dutch population. According to the review of the expert panel, no significant modifications were made.

The questionnaire was then pre-tested in ten patients, 4 men and 6 women with a mean age of 48.5 years (sd 9.6), suffering from different shoulder complaints (adhesive capsulitis n=6, calcifying tendinitis n=2, subacromial impingement n=1 and shoulder instability n=1). These patients filled in the questionnaire in the presence of the principal investigator and their opinions on readability, missing aspects and suggestions for improvement was recorded. One patient reported difficulties with reading the questionnaire, due to visual impairments in combination with the small font which was at that time 10 points. One patient suggested adding 'handicraft' as a new example to cover a broader range of leisure activities. The font was enlarged and the suggestion to add handicraft was followed, and after consulting the expert panel, the Dutch language version of the SRQ (SRQ-DLV) was finalised (see appendix).

Patients

Consecutive patients with shoulder disorders attending the departments of Orthopaedics and Radiology of the Leiden University Medical Center (LUMC) and the department of Orthopaedics of the Diaconessen Hospital in Leiden, from January 1999 to September 2001 were recruited. Patients were at least 18 years of age and fluent in Dutch. Three groups of patients with persistent shoulder disorders (> 3 months) were enrolled in this study:

Group I: patients from the orthopaedic out-patient clinics who suffered from adhesive capsulitis and were referred to the department of physical therapy of the LUMC.

Adhesive capsulitis was defined as a primary or secondary intrinsic shoulder disease with a characteristic pattern of reduced mobility and a reduced joint capacity of less than 15 cm3 as determined by arthrography. Passive range of motion was less than 50% in external rotation, abduction or elevation, as compared with the other side.

Group II: patients from the department of Radiology of the LUMC, who had calcifying tendinitis of the rotator cuff, as determined by radiography or sonography, and who would undergo needling during fluoroscopy in the Radiology department. During this procedures calcium deposits can be removed by needle lavage and aspiration. [12]

Group III: patients of the departments of Orthopaedics who had a subacromial impingement syndrome or a rotator cuff lesion, as determined by Magnetic Resonance Imaging or arthrography, and who would undergo a surgical subacromial decompression and / or rotator cuff repair.

Patients with chronic inflammatory diseases, osteoarthritis of the glenohumeral joint and patients with impairments in the cervical spine, elbow and / or hand affecting shoulder function were excluded. The local Medical Ethics Committees approved the protocol. All patients gave written informed consent.

Assessment methods

Timing of assessments

One week before the baseline assessment, patients were mailed the SRQ-DLV and asked to complete it and register the time needed to complete it. The baseline assessment, including completion of a second SRQ-DLV, was done directly before the interventions, i.e. at the start of the physiotherapy treatment (group 1), on the day of the needling (group 2) or on the day of admission in the surgery group (group 3). [13] All clinical assessments were done by two trained physical therapists (HMV or DCGB).

Sociodemographic data

At baseline sociodemographic data (sex, age, employment status) were gathered by interview and data on disease history (duration of the complaints, previous treatment) were derived from the medical record.

Shoulder function and daily activities

a. Range of Motion (ROM) Active and passive ROM in the directions of flexion, abduction and external rotation were measured with a conventional goniometer. Patients were in a seated position according to the guidelines of the American Association of Orthopaedic Surgeons. [14] Values were rounded off to 5 degrees.

b. Muscle strength A hand-held dynamometer (MicroFet®, Hoggan, Health Industries Inc., Draper,UT,USA) was used to determine the strength of the glenohumeral abduction, elevation and external rotation. Resistance was increased during 3 seconds until the patient was unable to hold the test position ('break test'). [15] The mean value of 3 attempts was used.

c. Pain Patients were asked to rate shoulder pain at rest, during movement and during the night on 3 separate visual analogue scales (horizontal lines of 100 millimetres with 0 = no pain on the left and 100 = very severe pain on the right side).

d. Arm function dimension of the Dutch Arthritis Impact Measurement Scale 2 (Dutch-AIMS2) Four questions of the arm function dimension of the Dutch-AIMS2 (putting on a pullover shirt, combing hair, scratching or washing the lower back and reaching shelves above the head) were included and scored on a five point scale with each item having a minimum score of 1 point (best function) and a maximum of 5 points (worst function).[16]

e. Shoulder Disability Questionnaire The Shoulder Disability Questionnaire (SDQ) covers 16 items describing in what kind of daily activities patients experience pain with 3 answering options 'yes', 'no' and 'not applicable'. The ratio of the number of items with an affirmative answer over the number of applicable items is multiplied by 100. The ratio is used as a summary score and ranges from minimum 0 (no functional limitation) to maximum 100 (affirmative answer to all applicable items). [8]

f. Shoulder Function Assessment scale (SFA) The SFA is a simple outcome measure that was initially developed for patients with rheumatoid arthritis. It consists of two visual analogue scales, one for pain at rest and one for pain during movement, four multiple choice questions about activities of daily living and three measures for range of motion i.e. total active abduction and two combined movements asking the patient to place the hand on the head with the elbow forward and backward. The overall score has a minimum of 0 points (worst shoulder function) and maximum of 70 points (best shoulder function).[17]

g. Subjective opinion of the shoulder after treatment Overall improvement was measured after 3 months by asking the patients to rate their shoulder disability in comparison with the baseline on a five point Likert scale ('much worse' to 'much better').

h. Work dimension of the Dutch-AIMS2 Four questions from the work dimension of the Dutch-AIMS2 (assessing the inability to do any work, the need to work a shorter day, inability to work efficiently or to change the manner in which usual work was performed) were included and scored on a five point scale with each item having a minimum score of 1 point (best function) and a maximum of 5 points (worst function). [16]

Quality of life

The Short Form-36 (Dutch version[18]) was used, a generic measure of quality of life addressing eight health concepts. [19] From these eight health concepts two summary scales, one for physical and one for mental health can be computed.

Analysis

All variables were tested for normal distribution using the Kolmogorov-Smirnov test and, expressed medians and ranges. Missing values were replaced by the mean value of the group.

Internal consistency of the questionnaire was determined using the baseline data and computing the Cronbach's alpha for the domains and summary score. [20] Intra Class Correlation coefficients (ICC, 2.1) were computed to investigate the reliability of the SRQ-DLV between the two assessments within one week. Differences between the scores obtained within one week were analysed by a Wilcoxon Signed Rank test. [21]

The summary score of the SRQ-DLV was correlated with various outcome measures by means of Spearman's rho.

To examine responsiveness to clinical change the mean difference between baseline and three months was calculated for each variable with a 95% confidence interval (CI). The magnitude of the changes was described in terms of effect size (ES) and standardised response mean (SRM) [22], where

$$ES = \frac{\text{pre-treatment mean - posttreatment mean}}{\text{sd of pre-treatment mean}}$$

$$SRM = \frac{\text{pre-treatment mean - posttreatment mean}}{\text{sd of the change score}}$$

Cohen's interpretation of the magnitude of ES (a value of 0.2 is small, 0.5 is moderate, and 0.8 is large) can also be applied to the SRM. [23]

The Smallest Detectable Difference was computed to detect the minimal number of points the summary scale of the SRQ-DLV should change to reveal a statistically significant difference at the 0.05 level. [24] For this purpose the standard deviation of the difference between one week before baseline and baseline was multiplied by 1.96.

Results

A total of 107 patients fulfilled the selection criteria and participated in the study. Sixty-eight patients were referred for physical therapy because of adhesive capsulitis, twenty-two patients underwent needling in the shoulder for calcifying tendinitis and seventeen patients underwent surgery for subacromial impingement or a rotator cuff lesion. The basic characteristics are shown in Table 7.1. The data of 97 patients were used to compare differences between baseline and follow-up. Two patients could not appear at the follow-up due to reasons of health and a prolonged stay abroad and seven patients were unwilling to participate in the follow-up after three months.

Considering the practical applicability, the median time needed to fill in the questionnaire was 7 minutes (range 3 to 26 minutes). Overall, less than 1% of the answers were missing.

Table 7.1 Demographic and clinical characteristics of 107 patients who were treated for shoulder disorders

	Physiotherapy[1] n=68	Needling[2] n=22	Surgery[3] n=17	Total n=107
Female / male (no. of patients)	45 / 23	14 / 8	8 / 9	67 / 40
Age (mean, sd)	51.8 (8.4)	50.4 (5.1)	47.4 (10.8)	50.8 (8.4)
Paid employment (no. of patients)	40	16	8	64
Duration of complaints; months (mean, sd)	14.0 (10.3)	26.0 (23.7)	24.0 (12.8)	18.6 (15.5)
Previous treatment (no. of patients)				
- surgery	4	-	5	9
- physical therapy	55	17	12	84
- injections	44	9	15	68
- manipulation under anaesthesia	-	-	1	1
Currently using pain medication (no. of patients)	26	15	8	49

[1] Patients with adhesive capsulitis.
[2] Patients with calcifying tendinitis.
[3] Patients with Rotator Cuff tears and / or impingement.

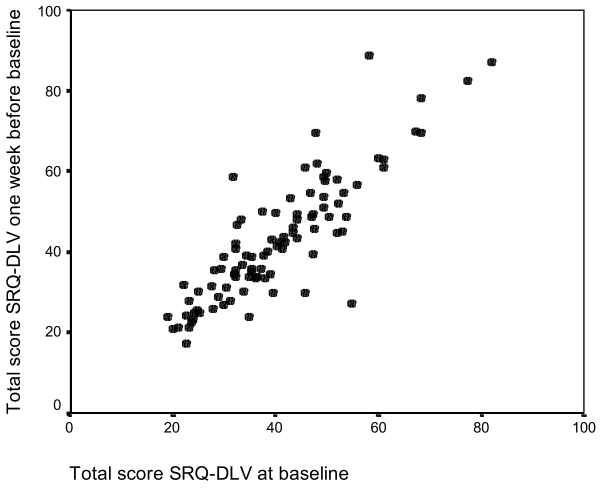

Figure 7.1 Scatterplot of the total score of the Shoulder Rating Questionnaire (SRQ) –DLV at baseline and one week before baseline in patients with various shoulder disorders (n =93)

Table 7.2 Test-retest scores of the Shoulder Rating Questionnaire-Dutch Language Version to evaluate reliability in patients with shoulder disorders (n=93)

	Median score (range) one week before baseline	Median score (range) at baseline	Mean difference (95% CI)	p- value ¶	ICC (95% CI)
Summary score	39.1 (18.9–81.9)	40.7 (17.1–88.8)	- 2.4 (-4.0– -0.8)	0.001*	.85* (.78–.90)
Domains:					
Global assessment	4.3 (0 -14.4)	5.2 (0–14.2)	- 0.6 (-1.1– -0.03)	0.132	.63* (.49–.74)
Pain	16.0 (8.0–36.0)	16.0 (8.0–38.0)	- 0.6 (-1.4–0.2)	0.066	.81* (.73–.87)
Activities of Daily Living (ADL)	8.7 (4.7–18.0)	9.3 (4.0–18.0)	- 0.4 (-0.8–0.08)	0.007*	.66* (.53–.76)
Sports / recreational activities	5.0 (3.0–14.0)	6.0 (3.0–15.0)	- 0.4 (-0.8– -0.08)	0.012*	.80* (.71–.86)
Work	3.0 (2.0–10.0)	3.0 (2.0–10.0)	0.05 (-0.3– -0.4)	0.537	.86* (.80–.90)

ICC = Intraclass Correlation Coefficient
¶ Wilcoxon Signed Rank Test
* p <0.05

Table 7.3 Spearman's correlation coefficients[¶] of the total score of the Shoulder Rating Questionnaire-Dutch Language Version related to (parts of) other measures in 107 patients with shoulder disorders (adhesive capsulitis, calcifying tendinitis, rotator cuff tears)

	Summary score of SRQ-DLV
Measures of shoulder function	
Active abduction	.41*
Active forward flexion	.38*
Active ext. rotation	.13
Abduction force	.37*
Elevation force	.30*
External rotation force	.22
Visual analogue scale for pain in rest	-.41*
Visual analogue scale for pain during movement	-.48*
Visual analogue scale for pain at night	-.57*
Activities and societal participation	
Dutch-AIMS2 arm function	-.49*
Dutch-AIMS2 work	-.74*
Shoulder Disability Questionnaire (SDQ)	-.31*
Shoulder Function Assessment (SFA) scale	.62*
Quality of life	
Short Form-36 (summary scale physical health)	.62*
Short Form-36 (summary scale mental health)	.34*

[¶] r = 0.10 to 0.29 = small, r = 0.30 to 0.49 = medium, r = 0.50 to 1.0 =large (idem when values are negative)

[29] p<0.01 .

Table 7.5 Distribution of change scores of the summary score of the SRQ-DLV after 3 months in relation to the Smallest Detectable Difference (+/-15.2) (n=97)

Change score	No. of patients	Mean change (95% CI)
Larger than 15.2	57	33.1 (29.6–36.6)
From 0 to 15.2	32	6.7 (5.2–8.3)
From -15.2 to 0	7	-6.1 (-2.0– -10.3)
Lower than -15.2	1	-16.8

Cronbach's alpha for internal consistency was 0.89 for the total questionnaire and 0.81, 0.80, 0.72 and 0.84 for the domains pain, daily activities, sports / recreational activities and work, respectively.

Ninety-three patients returned the SRQ-DLV within one week by mail. A scatterplot of the total score of the SRQ-DLV shows how closely individual patients rated themselves on two consecutive occasions within a week's interval (Figure 7.1). In these

Table 7.4 Median baseline and 3 months scores (range), mean change (sd), effect sizes (ES) and standardised response means (SRM) in 97 patients who were treated for various shoulder complaints.

	Baseline	3 months	Mean change (95% BI)	*p*-value[#]	Effect Size[¶]	SRM[¶]
Measures of shoulder function						
- active abduction°	85.0 (30–180)	120.0 (40–180)	31.0 (24.0–38.1)	<0.001*	0.85	0.88
- active forward flexion°	105.0 (40–180)	130.0 (40–170)	16.7 (11.6–21.8)	<0.001*	0.56	0.66
- active external rotation°	30.0 (-30–80)	35.0 (-10–90)	5.2 (2.4–8.0)	<0.001*	0.25	0.38
- muscle force in abduction (Newton)	102.0 (35–268)	112.0 (26–235)	10.9 (4.1–17.7)	0.002*	0.24	0.33
- muscle force in elevation (Newton)	54.0 (0–154)	64.5 (0–134)	11.2 (5.9–16.6)	<0.001*	0.42	0.48
- muscle force in external rotation (Newton)	69.0 (0–164)	79.0 (0–142)	11.3 (4.6–17.9)	0.001*	0.36	0.40
- visual analogue scale for pain in rest	37.0 (0–98)	16.0 (0–74)	16.9 (11.2–22.5)	<0.001*	-0.61	-0.60
- visual analogue scale for pain during movement	60.0 (3–100)	38.0 (0–98)	22.3 (16.8–27.8)	<0.001*	-0.93	-0.81
- visual analogue scale for pain at night	63.0 (2–99)	34.0 (0–98)	20.7 (14.1–27.4)	<0.001*	-0.72	-0.62
Activities and societal participation						
Dutch-AIMS2 arm function	16.0 (5–24)	10.0 (5–21)	4.3 (3.3–5.3)	<0.001*	1.0	0.87
Dutch-AIMS2 work	13.0 (4–20)	7.0 (4–18)	3.8 (2.7–4.9)	<0.001*	0.83	0.95
Shoulder Disability Questionnaire	81.2 (18–100)	62.5 (0–100)	24.3 (19.0–29.7)	<0.001*	-1.67	-0.91
Shoulder Function Assessment scale	38.6 (12–62)	53.6 (14–69)	13.2 (10.8–15.5)	<0.001*	1.13	1.14
Shoulder Rating Questionnaire-DLV summary score	39.6 (19–90)	62.1 (22–100)	21.5 (17.8–25.1)	<0.001*	1.5	1.17
- global assessment	5.0 (0–14)	10.0 (0–15)	4.4 (3.5–5.2)	<0.001*	1.37	1.04
- pain	16.0 (8–36)	26.0 (10–40)	8.8 (7.1–10.5)	<0.001*	1.37	1.04
- ADL	8.5 (5–18)	12.7 (6–20)	4.0 (3.3–4.7)	<0.001*	1.42	1.11
- sports / recreational activities	5.0 (3–14)	9.0 (3–15)	3.2 (2.6–3.8)	<0.001*	1.28	1.0
- work	3.0 (2–10)	5.5 (2–10)	1.1 (0.3–1.8)	0.005*	0.31	0.27
Quality of life						
- SF-36 summary scale physical health	43.8 (15–94.4)	56.8 (16.9–100)	11.7 (8.1–15.3)	<0.001*	0.72	0.65
- SF-36 summary scale mental health	72.6 (22–99)	81 (17.5–100)	6.0 (1.8–10.2)	0.004*	0.28	0.28

[#]Wilcoxon Signed Rank Test. [¶] 0.2 = small, 0.5 = moderate, 0.8 = large (idem when values are negative). *p <0.05.

patients test-retest reliability of the SRQ-DLV and its subscales was moderate to good, however, except for the global assessment, pain and work domain, subscale scores were significantly better at the baseline assessment (Table 7.2). ICC's for the summary score and the domains pain, sports / recreational activities and work are good (all .80 or higher) while the ICC's for global assessment and ADL are somewhat lower, 0.63 and 0.66, respectively.

Spearman correlation coefficients between the SRQ-DLV and measures of shoulder function, activities, societal participation and quality of life are presented in Table 7.3. In general, correlations with the SRQ-DLV summary score and measures of shoulder function (range of motion, muscle strength and pain in rest) and overall mental health were, although statistically significant, weak to moderate. The associations with pain during movement and at night and measures including daily activities involving the shoulder (Dutch AIMS2 arm function and work, SFA scale and overall physical health) were somewhat stronger.

In general, patients improved significantly between baseline and follow up according to all variables (Table 7.4). The effect sizes and standardised response means of the applied measures were in general moderate to good, with the values of the SRQ-DLV summary scale and subscales (except for the work subscale) exceeding 1, indicating excellent ability to detect a clinical difference.

With the Smallest Detectable Difference for the SRQ-DLV summary scale being 15.2 points, in 58 out of the 97 patients of whom change scores could be computed, the change score of the summary score after three months was larger than 15.2 points (Table 7.5). In 57 out of these 58 patients this change score was positive.

With respect to the patient's overall judgement of shoulder function three months after baseline, forty patients rated their shoulder function as much better and thirty-four as better, while seventeen patients did not report a change in shoulder function. Five patients judged their shoulder function as worse (one patient with adhesive capsulitis, two with calcifying tendinitis and two patients with a rotator cuff tear) while one patient, suffering from adhesive capsulitis, judged the change in shoulder function as much worse. Change scores of the summary score of the SRQ-DLV in relation to these subjective overall results are presented in Table 7.5.

Discussion

In this study it was shown that a translation and adaptation of the Shoulder Rating Questionnaire into the Dutch language was successful. The properties of the translated version regarding internal consistency, test-retest reliability, validity and responsiveness to clinical change for well-defined clinical shoulder problems were good and comparable with the properties of the original version. Completing this self-administered questionnaire only takes a short time and is therefore user-friendly.

This is the first time the Shoulder Rating Questionnaire has been translated and adapted into another language. International guidelines for cross-cultural adaptation of health related measures were used to preserve equivalence of the measure in the

Dutch language. In the end only small adaptations to the Dutch situation in the do - main of recreational and athletic activities were proposed and tested.

In both the original and the present study the Cronbach's alpha exceeded the 0.70 threshold for the overall questionnaire and every subscale. The test-retest reliability of the SRQ-DLV appeared to be good, although in the original study correlation coeffi - cients were somewhat higher. Moreover, we found a systematic difference between two assessments done within one week in clinically stable patients, with the second meas - urement (except for the domains sports and work) showing a better result than the first measurement. This observation is likely to be attributed to the so-called "regression to the mean" phenomenon.[25] All patients entering this study had serious shoulder com - plaints at baseline warranting treatment at that time point, and therefore an improve - ment is more likely to occur than a worsening.

In our study significant associations of the summary score of the SRQ-DLV with measures of shoulder function, activities, societal participation and overall quality of life emphasises the ability of the SRQ-DLV to measure shoulder disability on various aspects of health status. In addition, the responsiveness of the SRQ-DLV proved to be excellent. More and more, the importance of the sensitivity of measurement instru - ments to detect clinical changes over time is acknowledged. [22]

An important reason for selecting the Shoulder Rating Questionnaire to be trans - lated and validated into Dutch was its potential ability to investigate the influence of shoulder disorders on three levels: shoulder function, activities involving the upper extremity and societal participation (work, leisure and sports activities). The last of these in particular is not common in questionnaires regarding shoulder disorders. In the SRQ the domains of work, athletic and recreational activities refer to important elements of a patient's life that may be relevant for the overall quality of life. In our study the responsiveness of the work subscale was relatively small in comparison with the other subscales of the SRQ-DLV and the work dimension of the Dutch AIMS-2. As the SRQ-DLV work subscale and the Dutch AIMS-2 work dimension actually comprise the same items, a revision of the scoring method for the items in the SRQ-DLV work subscale may be needed. In addition, the added value of the SRQ-DLV in relation to other available instruments for evaluating shoulder function must be considered. Although its internal consistency and reliability may be somewhat weaker than those of other instruments available in Dutch [26,27], its performance was still suffi - cient and its sensitivity to detect clinical changes over time appeared to be excellent. If the use of alternative instruments that were developed in other countries is considered, we strongly advocate to make translations and adaptations according to international guidelines for cross-cultural adaptations of questionnaires, a process which appeared to be feasible and successful in our study.

In conclusion, we have successfully translated and adapted the SRQ into the Dutch language. Our data show that the SRQ-DLV is a reliable, valid and responsive instru - ment for use in clinical trials including patients with various shoulder disorders. [22] Until now the SRQ has only been used in hospital settings and in studies with well-defined shoulder disorders.[9,28] The applicability of the SRQ-DLV for patients with shoulder complaints in primary care, where diagnosis of shoulder disorders is not always con -

firmed by radiography or MRI, has to be established and will be investigated in further studies.

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Clinical messages

The process of translation and adaptation of a patient based questionnaire according to international guidelines for cross-cultural adaptations of questionnaires appeared to be feasible and successful.

The Dutch Language Version of the Shoulder Rating Questionnaire is a reliable, valid and responsive instrument to be used in clinical trials.

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Appendix

Shoulder Rating Questionnaire Dutch Language Version

1. Ga na in welke mate uw schouderklachten u beïnvloeden en plaats een kruisje (X) op de onderstaande schaalverdeling hoe goed u zich voelt.

erg slecht ———————————————————— erg goed

2. Hoe omschrijft u, gedurende de afgelopen maand, de pijn in uw schouder die u gewoonlijk voelt in rust?

a. heel erg	b. erg	c. matig	d. gering	e. geen

3.Hoe omschrijft u, gedurende de afgelopen maand, de pijn in uw schouder die u gewoonlijk voelt bij het uitvoeren van activiteiten?

a. heel erg	b. erg	c. matig	d. gering	e. geen

4. Hoe vaak heeft u in de afgelopen maand 's nachts moeite gehad met slapen door pijn in uw schouder?

a. elke dag	b. meerdere dagen per week	c. één dag in de week	d. minder dan één dag per week	e. nooit

5. Hoe vaak heeft u in de afgelopen maand ernstige pijn in uw schouder gehad?

a. elke dag	b. meerdere dagen per week	c. één dag in de week	d. minder dan één dag per week	e. nooit

6. Als u let op het gebruik van uw schouder tijdens dagelijkse persoonlijke en huishoudelijke activiteiten (zoals aankleden, wassen, autorijden, huishoudelijke karweitjes etc), hoe zou u de mogelijkheid om uw schouder te gebruiken beschrijven?

a. zeer ernstig beperkt; onmogelijk	b. ernstig beperkt	c. matig beperkt	d. gering beperkt	e. niet beperkt

Vraag 7- 11: Hoeveel moeite heeft u in de afgelopen maand gehad met de volgende activiteiten vanwege uw schouderklacht?

7. Het aantrekken of uittrekken van een trui of T-shirt.

a. onmogelijk	b. veel moeite	c. enige moeite	d. weinig moeite	e. geen moeite

8. Het kammen of borstelen van uw haar.

a. onmogelijk	b. veel moeite	c. enige moeite	d. weinig moeite	e. geen moeite

9. Het reiken naar een legplank boven uw hoofd.

a. onmogelijk	b. veel moeite	c. enige moeite	d. weinig moeite	e. geen moeite

10. Het wassen of krabben van uw onderrug met uw hand.

a. onmogelijk	b. veel moeite	c. enige moeite	d. weinig moeite	e. geen moeite

11. Het tillen of dragen van een volle tas met boodschappen (3-5 kg).

a. onmogelijk	b. veel moeite	c. enige moeite	d. weinig moeite	e. geen moeite

12. Hoe omschrijft u uw schouderfunctie met betrekking tot het gebruik van uw schouder tijdens vrije tijd of sportactiviteiten (handwerken, tuinieren, tennis, golf, aerobics etc.)?

a. zeer ernstig beperkt; onmogelijk	b. ernstig beperkt	c. matig beperkt	d. gering beperkt	e. niet beperkt

13. Hoeveel moeite heeft u in de afgelopen maand gehad met bijvoorbeeld het gooien van een bal of het bovenhands serveren bij tennissen , vanwege uw schouderklacht?

a. onmogelijk	b. veel moeite	c. enige moeite	d. weinig moeite	e. geen moeite

14. Welke activiteit (vrije tijd of sportbeoefening) doet u bijzonder graag?

Activiteit …
Kies dan de mate van beperking die u eventueel ervaart bij deze activiteit vanwege uw schouderklacht.

a. zeer ernstig beperkt; onmogelijk	b. ernstig beperkt	c. matig beperkt	d. gering beperkt	e. niet beperkt

15. Wat was, gedurende de afgelopen maand, uw voornaamste arbeid?

a. betaalde arbeid, nl …
b. huishoudelijk werk
c. school
d. werkeloos
e. niet werkzaam als gevolg van uw schouderklachten
f. niet werkzaam als gevolg van andere oorzaken
g. gepensioneerd

Indien u antwoord d, e, f of g hebt ingevuld bij vraag 15, dan mag u vraag 16-19 overslaan en verder gaan naar vraag 20.

16. Hoe vaak was het voor u de afgelopen maand onmogelijk uw normale werk uit te voeren vanwege uw schouderklacht?

a. elke dag	b. meerdere dagen per week	c. één dag in de week	d. minder dan één dag per week	e. nooit

17. Hoe vaak kon u, op de dagen dat u werkte gedurende de afgelopen maand, uw werk niet zo nauwkeurig of zo efficiënt uitvoeren als u zou willen, vanwege uw schouderklacht?

a. elke dag	b. meerdere dagen per week	c. één dag in de week	d. minder dan één dag per week	e. nooit

18. Hoe vaak heeft u, op de dagen dat u werkte gedurende de afgelopen maand, voortijdig moeten stoppen met uw werk vanwege uw schouderklacht?

a. elke dag	b. meerdere dagen per week	c. één dag in de week	d. minder dan één dag per week	e. nooit

19. Hoe vaak heeft u, op de dagen dat u werkte gedurende de afgelopen maand, uw gebruikelijke werk moeten aanpassen vanwege uw schouderklacht?

a. elke dag	b. meerdere dagen per week	c. één dag in de week	d. minder dan één dag per week	e. nooit

20. Hoe tevreden was u gedurende de afgelopen maand over uw schouder?

a. ontevreden	b. redelijk	c. goed	d. heel goed	e. uitstekend

21. Rangschik twee aspecten uit het onderstaande rijtje waarin u het liefste verbetering zou willen zien (plaats het cijfer **1** bij het meest belangrijke het cijfer **2** bij het op één na meest belangrijke).

… Pijn
… Dagelijkse persoonlijke en huishoudelijke activiteiten
… Vrijetijds- of sportactiviteiten
… Werk