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Reliability and Validity of the Dutch Translated Aberdeen Varicose Vein Questionnaire

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Abstract *Objective:* To evaluate reliability and validity of the Dutch translated Aberdeen Varicose Vein Questionnaire (AVVQ) for measuring health related quality of life (HR-QOL) in patients with venous disease in the lower limb.
Methods: The AVVQ consists of 13 questions related varicose veins. This study assessed feasibility, reliability and validity of the Dutch translated AVVQ in a sample of 145 patients with venous disease of the leg. Test and retest of the Dutch translated AVVQ were performed within a 2 week interval.
Results: There was a high test (99%) and retest (97%) response. Feasibility; AVVQ showed few missing answers (0.6%) and non-unique answers (0.2%). Regarding internal consistency; Cronbach's α exceeded 0.7 indicating a high level of concordance between the AVVQ questions ($\alpha = 0.76$). Test–retest reliability; Spearman's rho showed a significant strong association between test and retest scores (rho = 0.87). Discriminative validity; AVVQ score was able to differentiate between subgroups of patients with different severity of venous disease according to the CEAP classification (Mann–Whitney *U* test, $p < 0.01$).
Conclusions: This study supports applications of the Dutch AVVQ in HR-QOL measurement in patients with venous disease in the Netherlands and the Flemish speaking part of Belgium.

Introduction

Venous disease in the lower limb accounts for substantial healthcare expenditure in the western world.[1,2] A disease specific quality of life (QOL) measurement should be included in the measurement of outcome to assess the effect of treatment for varicose veins. The Aberdeen

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Varicose Vein Questionnaire (AVVQ) was developed and validated by Garratt for measuring QOL in patients with varicose veins of the leg.[3,4] There is no translation and validation of the AVVQ in any other language. We adapted the AVVQ into Dutch following international guidelines, including three independent forward and two backward translations. This is discussed in the Methods.

To implement the AVVQ in the Netherlands we assessed feasibility, score distribution, reliability and known-group validity of the Dutch AVVQ in a sample of patients with venous disease of the lower limb.

Methods

The Aberdeen Varicose Vein questionnaire

The questionnaire consists of 13 questions (items) related to lower limb venous disease and is shown in Table 1. Question 1 is a diagram, where patients draw the location of their varicose veins. Questions 7 and 9 may only be answered with yes or no. The other questions had multiple response options. Questions 3 and 9 were answered with frequency of pain and use of painkillers. Questions 1, 2, 5, 6, 7, 8 and 9 should be answered for both legs.

Item scores were summed up after recoding the scores, which resulted in a scale score from zero to 100, with zero representing the best score, and 100 the worst score.

Adaptation process

The process followed to adapt the AVVQ into Dutch was based on Bullinger.[5] In brief, three translators, all native speakers in Dutch, independently translated the questions and the response options of the original English AVVQ into Dutch. They were instructed to pay attention to conceptual rather than literal equivalence, and to choose words and language constructions that were as simple as possible. The translators were vascular surgeons. The three resulting independent forward translations were compared and discussed in a group meeting of the three translators. Differences were documented and discussed until consensus was reached about the optimal phrasing of the Dutch AVVQ. This common forward translation was then given to two translators who were native speakers in English and fluent in Dutch. They each produced a backward translation that was both compared to the original AVVQ for conceptual equivalence with the original source version. The analysis was documented and necessary adaptations to the Dutch AVVQ version were made. The resulting Dutch AVVQ was then administrated to three patients with venous disease of the lower limbs to provide qualitative testing of readability and comprehension. Because this qualitative testing revealed no problem with the Dutch AVVQ, it was subsequently administrated in the study population to collect data for psychometric analysis.

The complete Dutch translated AVVQ is provided in the Appendix. It may be used without licence fee in scientific projects.

Study population and data collection

All patients who visited our outpatient clinic in Rotterdam, the Netherlands, with venous disease of the leg, were asked to participate in this study. No patient refused to participate. In total 145 patients were included in 18 months, with at least 20 patients in each C-group of the [Clinical-Etiology-Anatomy-Pathophysiology] (CEAP classification), ranging from C1 to C6 (Table 1).[6]

All patients received the AVVQ on the day of their outpatient clinic visit (questionnaire 1).

Questionnaires were filled in at home and returned directly by mail. A second copy of the AVVQ (questionnaire 2) was sent to the participants by mail after two weeks and was returned as well, to determine the test–retest reliability. If patients had a delay in returning the questionnaires, a reminder telephone call was made once. No patients were treated for their venous disease of the leg between test and retest.

Analysis

Only questionnaires with at least a 90% response to all items were eligible for analysis. In case of non-unique responses (more than one response per item), a random

Table 1 The Aberdeen Varicose Vein questionnaire

1 Please draw in your varicose veins in the diagram below (Fig. 1)
2 In the last two weeks, for how many days did your varicose veins cause you pain or ache?
3 During the last two weeks, on how many days did you take painkilling tablets for your varicose veins?
4 In the last two weeks, how much ankle swelling have you had?
5 In the last two weeks, have you worn support stockings or tights?
6 In the last two weeks, have you had any itching in association with your varicose veins?
7 Do you have purple discolouration caused by tiny blood vessels in the skin, in association with your varicose veins?
8 Do you have a rash or eczema in the area of your ankle?
9 Do you have a skin ulcer associated with your varicose veins?
10 Does the appearance of your varicose veins cause you concern?
11 Does the appearance of your varicose veins influence your choice of clothing including tights?
12 During the last two weeks, have your varicose veins interfered with your work/housework or other daily activities?
13 During the last two weeks, have your varicose veins interfered with your leisure activities (including sport, hobbies and social life)?

selection of either response was used. In case of a missing item response the total possible score for that item was subtracted from the maximum possible score for the scale. By doing so, a sumscore could still be calculated by dividing the total score by the new maximum possible score and multiplying by 100. For the items relating to left and right legs, some patients suffering from varicose veins in only one leg had a tendency to miss out boxes for the unaffected leg, rather than ticking the first box implying no symptoms. If a patient consistently missed out the response set for one leg had not drawn in any varicose veins on that leg in question 1 (Fig. 1), their missing responses were coded zero (no symptoms).

Evaluation of feasibility consisted of the assessment of response rates, and missing/non-unique answers. Score distribution was assessed by floor (25% of respondents or more exhibiting the worst possible score) and ceiling (25% of respondents or more exhibiting the best possible score) effects. Cronbach's α was used to evaluate internal consistency of the AVVQ.[7] This test assesses the average level of correlation between questions in a questionnaire. If the questionnaire is measuring a specific problem (venous disease of the leg), then there should be a high level of concordance between these questions. If a questionnaire is to be reliable, alpha should exceed 0.7. Test–retest reliability of the AVVQ scores was assessed by Spearman's correlation coefficient (rho), by two sided Wilcoxon's signed rank tests, and by effect size: $d = [\text{mean(a)} - \text{mean(b)}]/\text{SD}$ at the first measurement.[8] Effect sizes can be interpreted as follows: $d = 0.2–0.5$ is considered a small effect size, $d = 0.5–0.8$ is considered a medium effect size and $d > 0.8$ is a large effect size.

The discriminative ability between subgroups of patients with different severity of venous disease was assessed by Mann–Whitney U tests, and effect sizes.[8]

Results

Response

Questionnaire 1 was returned by 143 patients (test response 99%). There were no incomplete forms. Questionnaire 2 was returned by 140 patients (retest response 97%) with no incomplete forms. The five patients who did not return questionnaire 2 included the two patients who also did not return questionnaire 1. The age range was 23–85 years (mean 54; SD 13); 69% was female. There were at least 20 patients in every C-class of the CEAP classification (Table 1).

Feasibility

The AVVQ showed few missing answers (0.6% on average) and non-unique answers (0.2% on average). Some spontaneous remarks were made regarding the first item, in which patients had to draw their varicose veins in a picture of both legs (Fig. 1) (e.g. 'there are only varicose veins on my ankle and foot').

Score distributions and internal consistency

Two items of the AVVQ had floor effects. These were items 'degree of ankle swelling' (28%) and 'any discolouration?' (45%). None of the items had ceiling effects. Cronbach's α was 0.76.

Test–retest reliability

Mean AVVQ test score was 19.16 (SD 12.09) and mean AVVQ retest score was 19.62 (SD 11.76). Spearman's rho showed a significant strong association between test and retest scores (rho = 0.87, $p < 0.01$). Non-parametric testing for differences between the average AVVQ scores at test and retest (two sided Wilcoxon's signed ranks test) was not significant ($p = 0.12$). The effect size was very small (0.04).

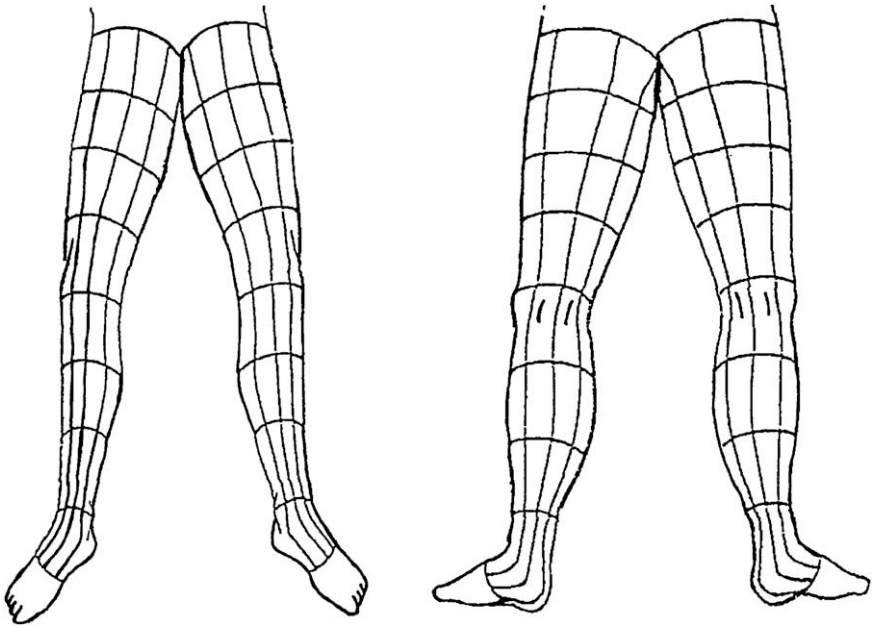


Figure 1 Diagram of legs (question 1 of AVVQ).

Table 2 Preoperative and postoperative AVVQ scores (standard deviation)

Group	Preoperative AVVQ score (SD)	Postoperative AVVQ score (SD)	p^a
All patients ($n = 143$)	19.54 (11.77)	16.11 (12.02)	<0.01
Subgroup A ($n = 50$)	11.12 (5.43)	9.24 (6.56)	$=0.01$
Subgroup B ($n = 50$)	18.65 (9.04)	14.96 (9.84)	<0.01
Subgroup C ($n = 43$)	30.36 (11.57)	25.43 (13.36)	<0.01

Subgroup A: clinical severity classes 1 and 2.
Subgroup B: clinical severity classes 3 and 4.
Subgroup C: clinical severity classes 5 and 6.
[a] Two-sided Wilcoxon's signed ranks test.

Discriminative 'known groups' validity

The AVVQ score was able to differentiate between subgroups of patients with different severity of venous disease (Mann—Whitney U test, $p < 0.01$); the effect sizes were large (0.84 and 1.01) (Table 2).

Discussion

This study established the feasibility, reliability and validity of the AVVQ in a Dutch population of outpatients with varicose veins. The psychometric properties of the Dutch AVVQ were similar to the original UK version. Score distributions, internal consistency and test—retest reliability in the Dutch sample have shown similar results as the UK samples.[3,4,9]

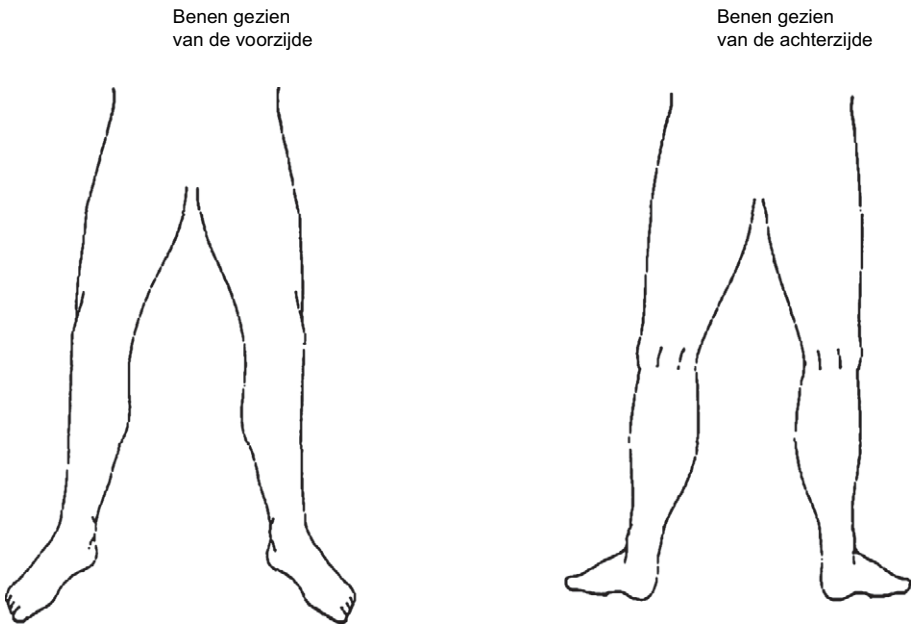
In the Dutch sample 2 items showed floor effects: 'degree of ankle swelling' and 'any discolouration?'. Regarding the former item; many patients in the higher C-classification suffered ankle swelling, which accounts for the floor effect in this study. Regarding the latter item; the large proportion of patients with small reticular veins may explain the high number of patients endorsing this item. Cronbach's α of 0.76 is comparable to internal consistency reported by Garrat (Cronbach's α of 0.72—0.74) in a UK sample.[3,9]

Conclusions

The current evaluation of the Dutch AVVQ showed properties that are largely comparable to those found in similar UK samples. This supports applications of the Dutch AVVQ in QOL measurement in patients with venous disease in the Netherlands and the Dutch speaking part of Belgium.

Appendix
Dutch translated AVVQ

1. Kunt u alstublieft uw spataderen in de plaatjes hieronder tekenen: (te zien zijn een plaatje van uw benen van voren en uw benen van achteren)



2. In de laatste twee weken, gedurende hoeveel dagen had u pijnklachten van uw spataderen?
(vul één hokje in)

	Rechter been	Linker been
Geen enkele dag	☐	☐
Tussen de 1 en 5 dagen	☐	☐
Tussen de 6 en 10 dagen	☐	☐
Gedurende meer dan 10 dagen	☐	☐

3. Gedurende de laatste twee weken, op hoeveel dagen gebruikte u pijnstillers voor uw spataderen?
(vul één hokje in)

Geen enkele dag	☐
Tussen de 1 en 5 dagen	☐
Tussen de 6 en 10 dagen	☐
Gedurende meer dan 10 dagen	☐

4. In de laatste twee weken, hoeveel enkelzwelling heeft u gehad?
(vul één hokje in)

Geen enkele dag	☐
Lichte enkelzwelling	☐
Middelmatige enkelzwelling (U moest bijvoorbeeld uw benen hoog leggen wanneer mogelijk)	☐
Ernstige enkelzwelling (U had bijvoorbeeld problemen uw schoenen aan te trekken)	☐

5. In de laatste twee weken, heeft u toen steunkousen gedragen?
(vul één hokje in voor ieder been)

	Rechter been	Linker been
Nee	☐	☐
Ja, steunkousen die ik zonder recept gekocht heb	☐	☐
Ja, steunkousen van de dokter, die ik af en toe droeg	☐	☐
Ja, steunkousen van de dokter, die ik iedere dag droeg	☐	☐

6. In de laatste twee weken, heeft u toen jeuk gehad door uw spataderen?
(vul één hokje in voor ieder been)

	Rechter been	Linker been
Nee	☐	☐
Ja, maar alleen boven de knie	☐	☐
Ja, maar alleen onder de knie	☐	☐
Boven én onder de knie	☐	☐

7. Heeft u paarse huidverkleuringen veroorzaakt door zeer fijne bloedvaatjes in de huid, in de buurt van uw spataderen?
(vul één hokje in voor ieder been)

	Rechter been	Linker been
Nee	☐	☐
Ja	☐	☐

8. Heeft u huiduitslag of eczeem in de buurt van uw enkel?
(vul één hokje in voor ieder been)

	Rechter been	Linker been
Nee	☐	☐
Ja, maar het behoeft geen behandeling van een dokter of verpleegkundige	☐	☐
Ja, en het moet worden behandeld door de dokter of verpleegkundige	☐	☐

9. Heeft u een open been in verband met uw spataderen?
(vul één hokje in voor ieder been)

	Rechter been	Linker been
Nee	☐	☐
Ja	☐	☐

10. Verontrust het uiterlijk van uw spataderen u?
(vul één hokje in)

- ☐ Nee
- ☐ Ja, een beetje
- ☐ Ja, heel erg

11. Verontrust het uiterlijk van uw spataderen u dermate dat het uw kledingkeuze bepaalt of dat u daarom steunkousen draagt?
(vul één hokje in)

- ☐ Nee
- ☐ Soms
- ☐ Vaak
- ☐ Altijd

12. Gedurende de laatste twee weken, hebben uw spataderen problemen gegeven bij uw werk/huishoudelijk werk of andere dagelijkse activiteiten?
(vul één hokje in)

- ☐ Nee
- ☐ Ik was in staat te werken, maar mijn werk heeft er licht onder moeten lijden
- ☐ Ik was in staat om te werken, maar mijn werk heeft er behoorlijk onder geleden
- ☐ Mijn spataderen hebben me één of meer dagen verhinderd te werken

13. Gedurende de laatste twee weken, hebben uw spataderen problemen gegeven bij uw vrijetijdsbezigheden (zoals sport, hobby's en uw sociale leven)?
(vul één hokje in)

- ☐ Nee
- ☐ Ja, het plezier was licht verminderd
- ☐ Ja, het plezier was behoorlijk verminderd
- ☐ Ja, mijn spataderen hebben me verhinderd deel te nemen aan elke vrijetijdsbesteding

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