



## Validation of the Persian Version of Aberdeen Varicose Vein Questionnaire

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### ABSTRACT

**Introduction:** Lower-limb varicose is a common disorder, which is caused in some occupations and is exacerbated over time, imposing direct and indirect costs on individuals and the community. The present study aimed to validate the Persian version of Aberdeen varicose vein questionnaire (AVVQ).

**Methods:** This cross-sectional study was conducted on 75 patients with varicose veins referring to Imam Reza Hospital in Mashhad, Iran in 2014. The subjects were selected via census sampling. The AVVQ was translated into Persian, and its reliability and validity were assessed using face, content, criterion, and construct validity and Cronbach's alpha coefficient for reliability. To evaluate content validity, the content validity ratio (CVR) was calculated, and the criterion validity was determined based on Pearson's correlation-coefficient. In addition, the correlation of the obtained score of each questionnaire item with the total score was verified.

**Results:** The mean age of the patients was 43±16 years. Content validity was assessed based on Lawshe's method and CVR index of >0.7. The mean score achieved in the AVVQ was 62.3± 8.8, and significant correlations were observed between the total score of AVVQ and physical domain (P<0.001; r=-0.62), mental domain (P<0.001; r=-0.39), and mean total score of SF-36 (P<0.001; r=-0.56). Moreover, the Cronbach's alpha for the internal consistency of the questionnaire was estimated at 0.71.

**Conclusion:** According to the results, assessment of the score of quality of life in varicose patients could be an effective approach to the development of proper interventions to improve their quality of life.

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### Introduction

The prevalence of varicose vein has been estimated at 40% in men and 32% in women, while more than 80% of the general population experience minor venous abnormalities. The main risk factors for the exacerbation of varicose veins include multiparity, being overweight (women only), and prolonged standing position (1). Lower-extremity venous insufficiency and varicose veins

are considered to be the seventh most common cause of hospital admissions in the United States.

The incidence of varicose veins depends on several factors, such as age, gender, heredity, parity, obesity, lifestyle, and occupation (2). Varicose veins affect a quarter of the adult population in Western countries, leading to morbidity and constant dependence on health services (3). Low

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quality of life is another complication in patients with varicose veins, which could be improved by surgery. The most common venous symptoms in these patients include pain, eczema, phlebitis, bleeding, and venous ulceration, while 1% of the adult patients have also reported active leg ulceration due to underlying venous diseases (1, 4).

Quality of life decreases with the increased severity of diseases. Patients with varicose veins may also experience other venous diseases, such as edema, skin changes, and ulcers (4, 5). In the surveys conducted in low-income countries, resource allocation has been considered to be of utmost importance for the effective treatment of varicose veins (6), and the patients with poor quality of life are speculated to reap the maximum benefits from the treatment.

Aberdeen varicose vein questionnaire (AVVQ) is a valid instrument for the assessment of the quality of life of patients with lower-limb varicose veins. AVVQ was developed and validated by Garatt et al. in 1996 (7). Considering the lack of the Persian translation of AVVQ, we attempted to translate this tool into Persian and evaluate its validity and reliability in regards to varicose veins in the Iranian population. AVVQ could be used effectually to properly examine the quality of life of these patients, laying the groundwork for further investigations regarding the prevention, early diagnosis, and treatment of varicose veins.

## Methods

This cross-sectional study was conducted on 75 patients with varicose veins. The translated version of AVVQ was applied, which consisted of 13 items. Considering the objectives of the research, five patients responded to each item of the questionnaire in order to determine the sample size. The inclusion criteria were consent to participate in the study and absence of concomitant diseases. In total, 75 patients with varicose veins referring to Imam Reza Hospital in Mashhad, Iran in 2014 were selected via convenience sampling.

AVVQ was validated by Garatt et al. in 1996 and consists of 13 items regarding the quality of life of patients with varicose veins (7). The instrument is used to evaluate the effects of varicose veins on the patients within the past two weeks. The first item is focused on the site of varicose veins, which should be determined by the patient in the form of a schematic image. In addition, seven items are focused on the manifestation of symptoms such as pain, swelling, itching, skin discoloration, ulcers, eczema, and rashes within the past two weeks, and two items are about the use of medications for pain control and patient support. The last three items in AVVQ are focused on the impact of

varicose veins on the daily activities of the patient. The total score in AVVQ is calculated within the range of 0-100, with score zero indicating optimal quality of life (7).

Prior to the use of AVVQ, the SF-36 questionnaire was completed for each patient, which is a validated instrument to measure health-related quality of life and has proven beneficial in various diseases. SF-36 contains 36 items on the mental component scale (MCS) and physical component scale (PCS). Each component is divided into eight domains, including physical functioning, physical role, bodily pain, general health, vitality, social functioning, emotional role, and mental health. The score of each item is calculated within the range of 0-100. In the present study, both questionnaires were completed by trained interviewers.

Data analysis was performed in SPSS version 16, and the P-value of less than 0.05 was considered statistically significant. After obtaining the initial permit from the editor of AVVQ, the questionnaire was translated from English into Persian by two bilingual translators with a medical background, whose native language was Persian. The translators were trained on the conceptual aspect of the instrument rather than its word similarity, so that they could properly select simple equivalents. They independently translated the questionnaire, and any disagreement between the translators was resolved through discussion. Furthermore, back-translation was performed by two independent translators, and the translated questionnaire was compared to the original version. Finally, the revised version of the translated questionnaire was reviewed by 10 radiology and surgery experts in order to confirm its face validity. The final Persian translation of AVVQ was initially completed by 10 random participants so as to assess the face validity.

To examine the content validity of the instrument, the content validity ratio (CVR) was calculated. To this end, a panel of 10 experts evaluated each item of the questionnaire and presented their opinion by selecting the various options, including essential (E), helpful (H) or unnecessary (U) for each item. The following formula was devised based on Lawshe's method for the evaluation of content validity:

$$CVR = (ne - N/2) / (N/2)$$

In the mentioned formula, *ne* represents the number of the panelists selecting the E option, and *N* shows the total number of the panelists (8). In addition, the minimum acceptable CVR value is 0.7. In the present study, the experts decided whether all the items had relevance, and the CVR index was calculated for each item. The CVR index

for all the items in AVVQ (n=13) was determined to be >0.7, and no items were eliminated.

In the current research, Pearson's correlation-coefficient was also used to assess the criterion validity of AVVQ. In addition, the correlations between the total score of AVVQ and MCS, PCS, and SF-36 total scores were evaluated, assuming the values within the range of -1-+1, where  $\pm 1$  and zero indicated agreement and disagreement, respectively. The correlation between the score of each item of AVVQ with the total score of the questionnaire was also assessed in order to determine the construct validity. The Cronbach's alpha coefficient was applied to evaluate the reliability of the translated questionnaire, and the values within the range of 0.7-0.8 were considered acceptable.

## Results

The mean age of the patients was  $43 \pm 16$  years, with the youngest patient aged 13 years and the eldest aged 80 years. The mean scores of the physical domain, mental domain, and total score of the SF-36 were  $58.2 \pm 23.9$  (max: 99.2, min: 16.7),  $67.7 \pm 21.4$  (max: 98.75, min: 9.25), and  $62.6 \pm 20.7$  (max: 95.6, min: 13.7), respectively. In addition, the mean total score of AVVQ was  $16.2 \pm 8.3$  (max: 34.2, min: 2.3).

To assess the face validity of AVVQ, the semi-final questionnaire was distributed among some participants and experts, who determined the face defects of the questionnaires for correction. Moreover, the content validity of the instrument was determined based on the Lawshe's method and CVR index (>0.7), and construct validity was evaluated based on the correlation of the items with the total score of the questionnaire (Table 1). According to the obtained results, the correlation-coefficient between each item and total score of the questionnaire was >0.3, with the exception of items eight, nine, and 11 (Table 1).

With regard to the criterion validity, the total score of SF-36 had an inverse, significant correlation with the total score of AVVQ in the physical and mental domains (Table 2).

In order to assess the reliability of the Persian version of AVVQ, the internal consistency was calculated at the Cronbach's alpha of 0.71. The obtained results also indicated significant correlations between the total score of AVVQ and variable of bodily pain ( $P < 0.001$ ;  $r = -0.55$ ), physical functioning ( $P < 0.001$ ;  $r = -0.5$ ), general health ( $P < 0.001$ ;  $r = -0.46$ ), mental health ( $P < 0.001$ ;  $r = -0.5$ ), emotional role ( $P = 0.03$ ;  $r = -0.24$ ), social functioning ( $P = 0.001$ ;  $r = -0.35$ ), physical domain ( $P > 0.001$ ;  $r = -0.62$ ), mental domain ( $P < 0.001$ ;  $r = -0.39$ ), and mean total score of SF-36 ( $P < 0.001$ ;  $r = -0.56$ ).

**Table 1.** Construct Validity of AVVQ Based on Correlation-Coefficient Test (Correlation between score of each item and total score)

Questions	Pearson correlation coefficient	P value
Q1	0.756	0.001>
Q2	0.536	0.001>
Q3	0.481	0.001>
Q4	0.486	0.001>
Q5	0.421	0.001>
Q6	0.481	0.001>
Q7	0.622	0.001>
Q8	-0.085	0.460
Q9	0.275	0.017
Q10	0.391	0.001
Q11	0.209	0.072
Q12	0.600	0.001>
Q13	0.453	0.001>

**Table 2.** Criterion Validity of AVVQ Based on Correlation-Coefficient Test (Correlation between total scores of AVVQ and SF-36)

SF-36	Pearson's Correlation-Coefficient	P-value
Physical Domain	-0.621	0.001>
Mental Domain	-0.399	0.001>
Total Score of SF-36	-0.563	0.001>

## Discussion

The present study was conducted on 75 patients with varicose veins using the Persian translation of AVVQ, the validity of which was examined in five stages using the backward-forward method as an acceptable approach to confirming the face validation of an instrument. According to the obtained results, the CVR of the questionnaire items was within an acceptable range. Therefore, it could be inferred that each item in AVVQ could accurately measure the quality of life of patients with varicose veins. The previous studies regarding the validity of AVVQ in other languages have not reported the CVR index.

In a study, Klem used discriminative validity to show the construct validity of the Dutch version of AVVQ, concluding that the instrument was able to differentiate between subgroups of patients with variable disease severity (9). In the current

research, the construct validity of AVVQ was evaluated based on the correlation of the total score and questionnaire items. In addition, the correlation-coefficient between each item and the total score of AVVQ was determined to be within the range of 0.3-0.75 in most of the cases. Meanwhile, the correlation-coefficients were  $<0.3$  in case of three items, which was considered unacceptable. These items were focused on the incidence of skin rashes/eczema, skin ulcers, and restrictions in clothes selection.

In a similar research, Shepherd et al. compared AVVQ with two other questionnaires, namely SQOR-V and SF-12, concluding that both AVVQ and SF-12 had high sensitivity to the assessment of the quality of life in patients with varicose veins (10). In another study conducted by Kurz Xavier on patients with varicose veins, the mean physical PCS and mental MCS scores of SF-36 were reported to be 45.6 and 46.1, respectively (11), while these scores were significantly higher in the present study ( $58.2 \pm 23.9$  and  $67.7 \pm 21.4$ , respectively).

Regarding the evaluation of criterion validity, only Klem et al. have reported negative, significant associations between the total score of translated AVVQ with the MCS and PCS areas of the SF-36, which is indicative of the high criterion validity of the Persian version of the instrument (9). Furthermore, it demonstrated that higher AVVQ scores are interpreted as lower quality of life and presence of more symptoms. On the other hand, the findings of the current research denoted that the correlation between the AVVQ score and physical domain of SF-36 was more significant compared to the correlation with the mental domain, confirming that physical symptoms largely influence the quality of life.

In this regard, Smith et al. conducted a research in the United Kingdom, stating that physical components (physical functioning, role limitation due to physical problems, and bodily pain) had the most significant associations with the quality of life (12). In another study performed in the Netherlands, Klem et al. denoted a negative, strong, significant correlation between the total scores of AVVQ and SF-36 ( $P < 0.01$ ), which demonstrated the high criterion validity of the former, consistent with the results of the present study (9).

Garratt A. M. et al. and Garratt A. et al. have reported the acceptable internal consistency of the original version of AVVQ (7,13). The findings of the current research were also indicative of the proper reliability of the Persian version of AVVQ, with the Cronbach's alpha estimated at 0.7. According to the Altman and Bland hypothesis regarding the tools that could be used for the comparison of various groups by researchers, the Cronbach's alpha

of 0.7-0.8 is acceptable, which is in line with the current research.

## Conclusion

According to the results, the Persian version of AVVQ regarding the quality of life of patients with varicose veins is a reliable and valid instrument, which could be used in the investigations of the quality of life of these patients. Moreover, our findings demonstrated that reduced physical symptoms and pain in these patients could remarkably affect their quality of life. Therefore, the key role of primary care in patients with varicose veins is to provide reassurance and physical exercise (e.g., leg elevation and weight reduction) if necessary.

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## Conflict of Interest

The authors declare no conflict of interest.

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