Research Report

Cross-cultural Adaptation and Validation of the Hebrew Version of the Vulvar Functional Status Questionnaire (VQ)

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ABSTRACT

Background: As yet, no Hebrew language vulvar functional status questionnaire exists.

Aims: To perform a cross-cultural adaptation of a Hebrew version of the Vulvar Functional Status Questionnaire (VQ), a validated tool used for evaluating dyspareunia among women, and to evaluate the psychometric properties of this version by examining the correlations between results of the questionnaire among women with pain during intercourse and quality of life, level of anxiety, and pelvic floor function.

Methods: The English version of the VQ underwent cross-cultural adaptation to Hebrew according to accepted guidelines. Eighty Hebrew-speaking women with vulvar pain, aged older than 18 years, participated in the study. Participants completed the VQ-Hebrew (VQ-H) (see Supplemental Digital Content, available at: http://links.lww.com/JWHPT/A89), the Hebrew versions of the health-related quality-of-life questionnaire (SF-12), the Pelvic Organ Prolapse/Urinary Incontinence Sexual Function Questionnaire (PISQ-12), and the State-Trait Anxiety Inventory (STAI). All the participants completed the VQ-H again after 2 to 3 weeks. Psychometric properties (test-retest reliability, internal consistency, convergent validity, and factor analysis) were calculated.

Results: The VQ-H demonstrated excellent test-retest reliability: intraclass correlation coefficients ranged from 0.898 to 0.958 ($P < .001$); the Cronbach α was excellent (0.935). A significant correlation was found between the VQ-H and SF-12 scores ($r = -0.360$, $P = .001$). However, the correlation between the VQ-H and STAI and PISQ-12 scores was not statistically significant ($r = 0.172$, $P = .127$ and $r = -0.185$, $P = .100$, respectively). Factor analysis revealed a 4-factor solution representing daily function and pain provoked by or related to various activities.

Conclusion: The VQ-H is a valid and reliable instrument. Its scores reflect the impaired function in all domains of vulvar pain among Hebrew-speaking women.

Key Words: dyspareunia, function, Hebrew translation, reliability, validity, vestibulodynia, vulvar pain

INTRODUCTION

Vulvar pain (vulvodynia) is a common cause of sexual pain among premenopausal women, with a lifetime prevalence ranging from 17% to 19% among 20- to 60-year-old women.[1] Vulvodynia affects women's quality of life (QOL) and may affect that of their partners as well. The pain can be defined by its location (localized or generalized) or by the discomfort caused by it, provoked or unprovoked.

The subjects included in this study suffered from the "provoked pain" that can be provoked by a light touch, such as tight clothing or sitting; it can also be aggravated by intercourse, tampon insertion, or a gynecological examination. Mostly, without the aggravating cause, women are symptom free.

Reliable and valid instruments are essential for clinicians to identify the severity of symptoms and to evaluate the treatment outcomes of vulvodynia. Few self-administered questionnaires exist for this purpose. The various questionnaires were designed to examine different aspects related to pain and function

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of women's vulvodynia. Some questionnaires are specific to vulvodynia, such as the Vulvar Functional Status Questionnaire (VQ), which is used to identify situations that exacerbate the pain and to measure functional impairment.[2] Other questionnaires focus on pain, such as the Vulvar Pain Assessment Questionnaire (VPAQ),[3] or focus on the psychological aspect of pain, such as the Vaginal Penetration Cognition Questionnaire (VPCQ).[4]

Other questionnaires not specific to vulvodynia have been used in vulvodynia research. The Female Sexual Function Index (FSFI) is the most common, which measures women's sexual functioning.[5] The McGill Pain Questionnaire (MPQ) measures pain intensity, and the Pain Catastrophizing Scale (PCS) aims to evaluate the thoughts and feelings that are experienced while in pain.[6] Another questionnaire is the Pain Anxiety Symptoms Scale (PASS),[7] which focuses on chronic pain behaviors and anxiety conceptualization. It is challenging to create a clear pattern of pain perception that justifies the rationale for including multiple measures of pain and emotional function in treatment outcome studies of vulvodynia and vestibulodynia.[8]

Currently, no valid vulvar functional pain questionnaire in Hebrew exists. Therefore, the aim of this study was to conduct a cross-cultural adaptation of the VQ to the Hebrew language and evaluate its psychometric properties.

METHODS

Design

This was a cross-cultural adaptation and reliability study.

Cross-cultural Adaptation

The performance of the translation and cultural adaptation was based on the guidelines of Beaton et al.[9] Two independent translators translated the VQ from English into Hebrew (forward translation). Both translators' mother tongue was Hebrew, and they were fluent in English and aware of the questionnaire's conception. A reconciliation meeting was conducted, and the 2 forward translations were compared to obtain a consensus Hebrew version. The consensus version was then backward translated by 2 other independent English-speaking translators, unaware of the questionnaire's conception. The expert review committee consisted of all the translators, the authors, and 2 experienced physicians. All translations were reviewed for semantic, idiomatic, experiential, and conceptual equivalence. After reaching a consensus, a prefinal Hebrew version (VQ-H) was constructed. The prefinal version was then tested on a small sample of 10 subjects with vulvar pain to determine whether all questions were clear and understandable. No modifications were needed following this pretest.

Subjects

Participants were recruited during the period from September 2020 to March 2021 through social media groups (Facebook and WhatsApp) specified for women with dyspareunia or other sexual pain. *Inclusion criteria* included Hebrew-speaking women of reproductive age, older than 18 years, diagnosed with vulvodynia, and having access to a smartphone. *Exclusion criteria* included participation in another interventional clinical trial, a history of major psychiatric or neurological disorder, a history of major trauma or operation to the genitourinary system, or active rheumatologic disease. The study was approved by the ethics committee of Ben Gurion University.

Sample Size Estimation

The sample size calculation was performed using Power and Sample Size Calculation software (PS power and sample size calculation). We planned a repeated measurements study of a continuous response variable and calculated the sample size after collecting data from the first 10 subjects. The difference in responses between the 2 measurements was normally distributed with 2.5 SDs. The difference between means was 1.3; for extra assurance, we considered 1 as the potential difference. With this difference in the mean response, we needed to study 51 subjects to reject the null hypothesis that this response difference is zero with a probability (power) of .8. Type I error probability associated with the test of this null hypothesis is 0.05. To control for dropouts, we planned to recruit 80 subjects.

Questionnaires

A correlation was examined between the VQ-H and related Hebrew-translated questionnaires regarding the level of anxiety (STAI), QOL (SF-12), and pelvic floor function (PISQ-12).

The **VQ** is a questionnaire designed by physical therapists with the aim of identifying impaired functions due to pain as well as conditions that exacerbate it. The questionnaire contains 11 self-reported items; the score ranges from 0, representing the lowest level of function, to 3, the highest level of function. The total score is the sum of the 11 scores. The VQ was found to be valid and reliable for patients with vulvar pain.[2]

The **State-Trait Anxiety Inventory (STAI)** is a questionnaire designed to measure trait and state anxiety. It is used to diagnose anxiety and to differentiate between anxiety and depressive symptoms.[10] The questionnaire contains 20 items that are rated on a

4-point scale; higher scores indicate greater anxiety. Internal consistency coefficients for the scale range from 0.86 to 0.95; test-retest reliability coefficients range from 0.65 to 0.75 over a 2-month interval.[10]

The **SF-12** is a self-reported outcome measure of general health and its impact on the life of participants. It is commonly used to assess QOL. The questionnaire is a validated and reliable tool comprising 12 items that are scored online.[11,12]

The **Pelvic Organ Prolapse/Urinary Incontinence Sexual Function Questionnaire (PISQ-12)** is a short-form questionnaire that aims to evaluate sexual function in women with pelvic organ prolapse and/or urinary incontinence. The PISQ-12 contains 12 items. Questions 1 to 4 are scored from 0 (never) to 4 (always), and questions 5 to 12 are scored in reverse. A higher total score indicates better sexual function. It is a self-administered instrument that is validated and reliable.[13]

The Hebrew versions of the STAI, SF-12, and PISQ-12 were found to be highly correlated to their original English versions.[14–16]

All participants completed the questionnaires and demographic information on one occasion and were asked to refill the VQ 2 to 3 weeks after the first admission (they received the link and a reminder on WhatsApp).

Statistical Analysis

All statistical procedures were performed using the SPSS statistical package version 26, SPSS Inc. The *P* value was considered significant at a level of less than .05. Descriptive statistics were used to describe the demographic and clinical characteristics of all participants.

Test-retest reliability was performed by intraclass correlation coefficient (ICC). ICC values higher than 0.8 were considered to represent excellent reliability.[17] The Pearson correlation was used to examine the correlation of the VQ-H with the other questionnaires (STAI, SF-12, and PISQ-12) and to evaluate the convergent validity. Internal consistency of the VQ-H was calculated using Cronbach α analysis. Internal consistency was considered adequate when the Cronbach α was between 0.7 and 0.95.[18] Floor and ceiling effects were considered to be present if more than 15% of the respondents achieved the lowest or highest possible total score, respectively.[18] Finally, factor structure was analyzed using factor analysis with varimax rotation.

RESULTS

Eighty participants with vulvar pain who met the inclusion criteria were enrolled. Sociodemographic and clinical characteristics are summarized in Table 1.

Table 1. Demographic and Clinical Characteristics of the Studied Sample (N = 80)

Variable	Mean (Range)	SD
Age, y	28.50 (21-49)	4.77
BMI, kg/m^2	22.97 (16.18-36.44)	4.11
Number of birth	0.92 (0-7)	1.39
Age of first sex, y	20.26 (14-28)	3.06
Sport per week (times)	1.53 (0-6)	1.43
Years of pain	5.81 (1-17)	3.61
Sleeping hours	6.77 (3.5-9)	0.98
	n (%)	
Physical therapy use	72 (90.0%)	
SSRI	8 (10.0%)	
Migraine	14 (17.5%)	
Irritable bowel syndrome	5 (6.3%)	
Fibromyalgia	2 (2.5%)	
Primary vestibulodynia	50 (32.5%)	
Secondary vestibulodynia	30 (37.5%)	
Urinary tract infection	17 (21.3%)	
Yeast infection	31 (38.8%)	
Contraceptive pills	17 (21.3%)	

Abbreviations: BMI, body mass index; SD, standard deviation; SSRI, selective serotonin reuptake inhibitor.

The mean age of all participants was 28.5 ± 4.77 years, ranging from 21 to 49 years. VQ-H scores ranged from 2 to 26 (Table 1). There were no floor or ceiling effects, as none of the respondents achieved the lowest or highest score (2 participants scored 2, and 1 participant scored 26). All participants filled out the VQ-H, STAI, SF-12, and PISQ-12.

Internal Consistency

The Cronbach α for the VQ-H was 0.685, indicating a moderate level of internal consistency. For all items, the deletion of a specific item would have reduced the Cronbach α (Table 2).

Table 2 and the Figure demonstrate that there were items that received a relatively high mean score on a scale of 0 to 3. A higher score indicates that women reported these actions to be more painful than the others. These items are as follows: the use of a speculum, tampon use, finger inside the vagina, and touching outside the vagina.

Test-Retest Reliability

All participants (N = 80) completed the VQ-H twice in an interval of 2 to 3 weeks in order to minimize clinical changes in patients' condition. Mean ± SD values for the first and second admissions were 10.287 ± 3.47 and 8.675 ± 3.92, respectively; there was a significant difference (t_{79}= 7.845, $P < .001$]

Table 2. Descriptive Scale Characteristics and the Cronbach α of the VQ-H

	Mean ± SD	Scale Mean if Item Deleted	Cronbach α if Item Deleted
Wearing tight clothing	0.55 ± 0.73	8.02	0.610
Worsening of pain related to walking	0.11 ± 0.39	8.46	0.604
Worsening of pain related to sitting	0.44 ± 0.84	8.14	0.604
Taking painkillers due to the pain	0.05 ± 0.27	8.52	0.622
Worsening of pain related to bowel movement	0.6 ± 0.79	7.99	0.576
Avoiding meeting friends because of the pain	0.19 ± 0.58	8.41	0.586
The experience when the gynecologist inserts a speculum	1.91 ± 0.73	6.67	0.600
The ability to use a tampon	1.27 ± 1.26	7.31	0.629
Letting the partner insert his finger or penis in the vagina	1.71 ± 0.89	6.87	0.626
Partner's touch outside the vagina	1.13 ± 0.86	7.46	0.632
Woman touching herself for sexual pleasure	0.71 ± 0.86	7.87	0.583

Abbreviation: SD, standard deviation.

between the scores. Because of these findings and the α rate, the questionnaire was validated on the basis of the second admission of the questionnaire. ICC value was found to be 0.935 (95% confidence interval, 0.898-0.958), which is considered excellent internal consistency.

Convergent Validity

The results of the convergent validity are listed and presented in Table 3. The VQ-H was significantly correlated with the SF-12; the Pearson correlation was $r = -0.36$ ($P < .001$).

The Pearson correlation between the 2 scores of the VQ filled 2 weeks apart (represented as VQ_1 and VQ_2) was high (0.884) and statistically significant ($P < .001$).

The VQ showed a negative, moderate but significant correlation with the SF-12 (−0.36, $P = .001$). The correlations with the STAI and PISQ-12 were low and not significant (0.17, $P = .127$, and −0.19,

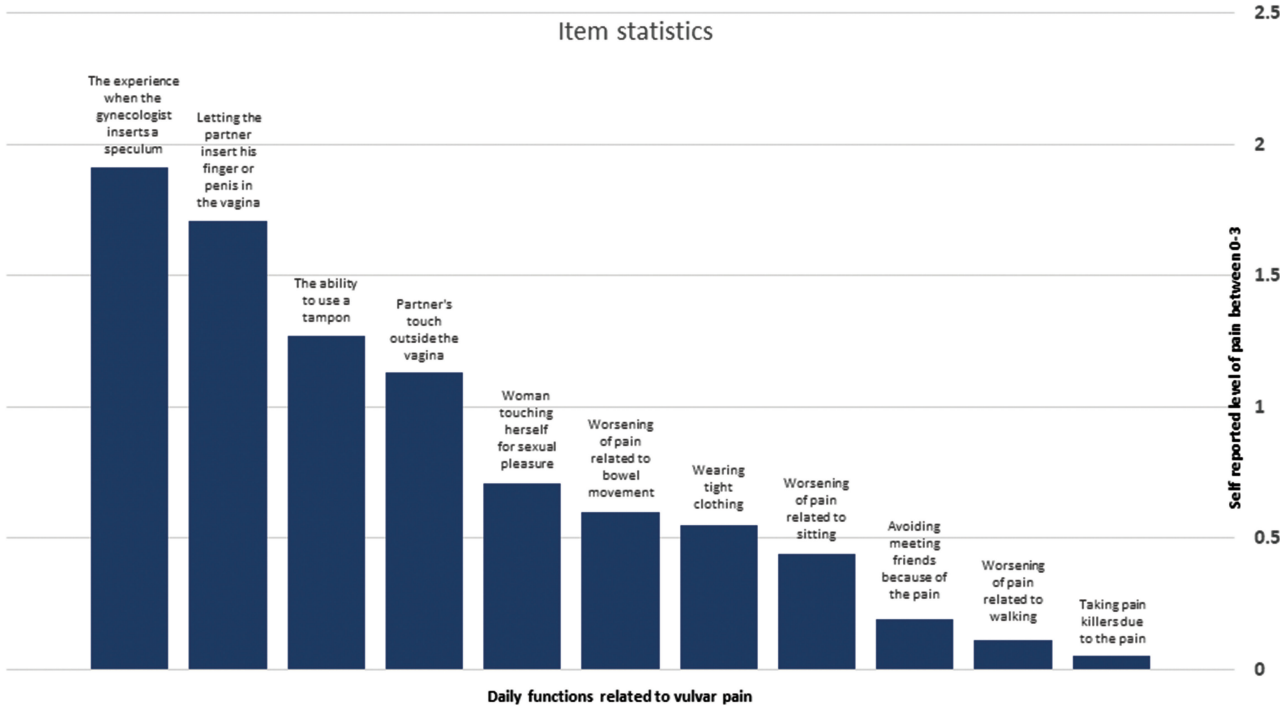

Figure. Histogram of mean values of VQ-H items.

Table 3. Convergent Validity (N = 80)

		VQ_1	STAI	SF-12	PISQ-12
VQ_2	Pearson correlation	0.884	0.172	−0.360[a]	−0.185
	Significance (2-tailed)	<.001	.127	.001	.100
STAI	Pearson correlation			−0.496[a]	−0.113
	Significance (2-tailed)			<.001	.319
SF-12	Pearson correlation				0.239[b]
	Significance (2-tailed)				.033

Abbreviations: PISQ-12, Sexual Incontinence Prolapse/Urinary Organ Pelvic Questionnaire; SF-12, Short-Form Health Survey; STAI, State-Trait Anxiety Inventory; VQ, Vulvar Pain Functional Questionnaire.
[a]Correlation is significant at the .01 level (2-tailed).
[b]Correlation is significant at the .05 level (2-tailed).

P = .100, respectively), thus demonstrating that no other existing questionnaires measure the same topic.

Factor Analysis

We performed factor analysis using varimax rotation. Four factor structures were extracted with eigenvalues greater than 1. The eigenvalues for the 4 factors were 2.90, 1.66, 1.46, and 1.08. The 4 factors explained 64.5% of the variance. After rotation, the variance explained by the factors was as follows: 20.22%, 15.86%, 14.65%, and 13.74%.

The first factor represents the QOL (items included worsening of pain related to walking, taking pain pills due to the pain, worsening of pain related to bowel movement, avoiding meeting friends because of the pain). The second factor represents activities of daily living (items included wearing tight clothing, worsening of pain related to walking, worsening of pain related to sitting). The third factor represents use of external accessories (items included the experience when the gynecologist inserts a speculum, the ability to use a tampon, woman touching herself for sexual pleasure). The fourth factor represents pain related to the partner (items included letting the partner insert his finger or penis in the vagina, the partner's touch outside the vagina). The results are presented in Table 4.

DISCUSSION

Vulvar pain (vulvodynia) is a common cause of sexual pain among premenopausal women. Women are reluctant to report pain during intercourse,[19] whether due to a lack of awareness to a possible solution or out of embarrassment or shame.[20] In addition, sometimes the intensity of the pain masks other feelings, and it is difficult for women to characterize the effects of pain. Moreover, there is a wide range of functional impairments among women with pelvic pain and vulvodynia. For some women, pain may affect 1 or

Table 4. Rotated Component Matrix[a]

	Component			
	1	2	3	4
Wearing tight clothing	−0.103	0.666	0.242	0.127
Worsening of pain related to walking	0.621	0.572	−0.060	−0.080
Worsening of pain related to sitting	0.233	0.745	0.099	−0.167
Taking pain pills due to the pain	0.724	0.161	−0.035	0.196
Worsening of pain related to bowel movement	0.718	0.087	0.224	0.117
Avoiding meeting friends because of the pain	0.759	0.475	0.019	−0.058
The experience when the gynecologist inserts a speculum	0.371	−0.253	0.703	−0.037
The ability to use a tampon	−0.068	0.194	0.661	0.057
Letting the partner insert his finger or penis in the vagina	0.107	−0.018	0.043	0.828
Partner's touch outside the vagina	0.069	−0.026	0.040	0.844
Woman touching herself for sexual pleasure	0.031	0.241	0.745	0.054

[a]Extraction method: Principal component analysis. Rotation method: Varimax with Kaiser normalization. Rotation converged in 10 iterations.

2 functions, while in others, several functions may be affected. The existence of a questionnaire that details the various functions that are associated with pain may help women to better define the difficulty they are facing (whether it is directly related to the vulvar pain or to other reasons) and empower women to discuss their pain and sensations during intercourse. Therefore, it is essential to have a valid and reliable tool for assessing pelvic floor function due to pain.

The aims of this study were to translate and cross-culturally adapt the English version of the VQ into Hebrew and to test the psychometric properties of the translated version. The translation procedure was conducted successfully according to accepted guidelines,[9] and the VQ-H was found to be a valid and reliable instrument.

The convergent validity represents the moderate strength and a negative direction of the correlation, meaning that the higher the VQ score, the lower the SF-12 score would be. The moderate strength of this correlation would probably be stronger with a larger sample.

Factor analysis using varimax rotation revealed 4 factor groups that explained 64.5% of the total variance.

The items of the VQ represent women's complaints that were gathered over the years regarding the effect of pain on various daily functions.

As shown in the Figure, the most painful action for women with vulvar pain is the use of a speculum. Speculum use is a procedure that is performed in a medical facility by a medical authority, involves contact in intimate areas, and is not under the patient's control; the action itself involves both superficial and deep contact. As professionals, these results should be considered when carrying out the vulvar examination. It should be performed very gently while involving the patient as much as possible with what is being done and acknowledging her discomfort or pain.

Compared with the original questionnaire in which ICC with the Cronbach alpha was 0.75 and 87% agreement on test-retest reliability, the ICC for the VQ-H was found to be 0.93. This is considered an excellent result. Internal consistency and test-retest reliability of the VQ-H indicate that this is a reliable instrument attuned to Israeli culture.

The STAI showed a low correlation with the VQ-H. The relatively low correlation found in our study may be attributed to the fact that the VQ items do not refer to mental state and symptoms despite being a functional questionnaire. This finding is consistent with the factor analysis results.

Our study has some limitations. First, the questions in the original questionnaire referred to "pelvic pain"; however, the Hebrew translation prevented a full understanding of the terminology and, as a result, the term was redefined as "pelvic floor pain," since the questionnaire was designed to examine pelvic floor pain in the vulvar area.

In addition, some questionnaire items are not specific to vulvodynia. The aim of the questionnaire is not to facilitate a differential diagnosis but rather to assess the impact of pain on daily activity regardless of the underlying cause. This is true for the Hebrew version as that for the original questionnaire.

The responsiveness of the VQ-H was not measured in this study. Participants were women with Internet access who were already aware of their condition and had been diagnosed. This could lead to a selection bias. However, despite these limitations, the study population was heterogeneous in terms of demographic variables, symptoms, behavior, and history.

To the best of our knowledge, this is the first study to examine vulvodynia using the VQ in the Israeli population, and it is the first to validate it in a non–English-speaking population. This contributes to the external validity of this tool.

The heterogeneous population of our study, regarding demographic variables, symptoms, behavior, and history, contributed to the generalizability of our findings.

CONCLUSIONS

The English version of the VQ was successfully translated and culturally adapted into Hebrew, and the VQ-H was found to be a valid and reliable instrument for clinical use and research among Hebrew speakers in Israel with vulvar pain.

Further studies are needed to assess the responsiveness of the VQ-H.

KEY POINTS

- The VQ was translated into Hebrew and culturally adapted for Hebrew-speaking patients with vulvar pain.
- The VQ-H demonstrated excellent test-retest reliability, a moderate level of internal consistency, convergent validity, and 4 factor subscales.
- The VQ-H is a suitable instrument to measure function in patients with vulvar pain.

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