ORIGINAL STUDY

Linguistic translation and validation of the Menopause-specific Quality of Life (MENQOL) questionnaire in Greek menopausal women

Evgenia-Ioanna Papadima, MD, MSc,[1] Anastasios Boutsiadis, MSc,[2] Alexandra Soldatou, MD, PhD,[3] Sofia Ivanidou, MD, MSc,[1] Tonia Vassilakou, PhD,[4] and Lina Michala, PhD, FRCG[1]

Abstract

Objective: The objective of this study was to translate the Menopause-specific Quality of Life (MENQOL) questionnaire in Greek and validate it for usage in the Greek population both in written and electronic form.

Methods: The original English questionnaire MENQOL with 1-month recall period was translated by our team. According to instructions by Mapi Research Trust, the questionnaire was forward and back-translated, followed by patient testing and proofreading. Then it was transcripted electronically. Validation was performed with the following tests: internal consistency (reliability), stability (test-retest reliability) with Cronbach's alpha correlations, independent and paired *t* tests, and Pearson's correlation coefficients.

Results: A total of 105 women, the majority recently menopausal, participated in the study. Internal consistency using the Cronbach's alpha showed high reliability ranging between 0.833 (physical domain) and 0.896 (vasomotor domain) for the written, and 0.720 (physical domain) and 0.868 (vasomotor domain) for the online form. Test-retest reliability was also high for both forms. The sexual domain of MENQOL had the higher mean, indicating the highest impact on quality of life (3.80 ± 2.35).

Conclusions: The Greek version of MENQOL is a reliable instrument for evaluating menopausal women. Availability of an online form will allow wider dissemination of the questionnaire. Further use of the questionnaire in Greece may lead to better understanding of the bothersome symptoms of menopause; a prerequisite to develop intervention studies for amelioration of quality of life.

Key Words: Greek language – Greek population – Menopause – MENQOL – Quality of life – Validation.

"Menopause" is derived from the Greek words "menos" meaning month and "pausis" meaning cessation. It is a biological stage in a woman's life when she is no longer fertile, and is marked by the ending of menstruation. A woman is defined as menopausal 1 year after her last period.[1]

Vasomotor symptoms (VMS), hot flashes, and night sweats are the hallmarks of menopause, occurring in approximately 75% of women, with 25% of women being severely affected.[1] It, therefore, comes as no surprise that menopause has a negative impact on quality of life (QoL).[2] The World Health Organization (WHO) defines QoL as an "individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns."[3] According to WHO "it is a broad-ranging concept affected by the person's physical health, psychological state, level of independence, social relationships, personal beliefs, and their relationship to salient features of their environment."[3]

The Short Form (36) Health Survey (SF-36) and the Menopause-specific Quality of Life (MENQOL) questionnaire are the most frequently used tools for assessing QoL in menopausal women.[3] The MENQOL is a validated questionnaire for the assessment of menopausal women's symptoms. It is a self-administered instrument, which functions well in differentiating between women according to their QoL and measuring changes in QoL over time.[4] The development and validation of the MENQOL were performed by John R. Hilditch, Jacqueline

E. Lewis, Peter G. Norton, and Earl Dunn, and the questionnaire was developed in English for Canada.[4] It has been widely adopted as a measure of QoL associated with menopause and has been translated in many languages, making it accessible for research in multiple countries.[5,6]

Validated translations for usage in specific populations (Danish for Denmark, Dutch for Belgium and Netherlands, English for USA, Finnish for Finland, French for France, Belgium and Canada, German for Germany, Italian for Italy, Japanese for Japan, Norwegian for Norway, Polish for Poland, Portuguese for Brazil, Spanish for Spain, Mexico, Puerto Rico, USA and Argentina) are available through eProvide; Mapi Research Trust, Lyon, France.[7] To date, there is no validated translation of MENQOL in Greek.

Purpose

The aim of this study was to translate the MENQOL questionnaire in Greek and validate it for usage in the Greek population. We also aimed at determining whether the questionnaire can be used in an electronic form, and to assess acceptability and results equivalency to those obtained through a hard copy.

METHODS

Permission was acquired from Mapi Research Trust, via signed agreement, to translate the questionnaire into Greek for Greece and validate it in Greek menopausal women.

Linguistic Validation of MENQOL with 1-month recall period was made in 2018 from our team. We followed the instructions given (Linguistic Validation Guidance) by Mapi Research Trust. The whole process consisted of four phases and is presented in Fig. 1.

Phase 1: forward translation step

The first step of the validation process involved the forward translation of the questionnaire by two independent professional translators, both bilingual in Greek and English, and native Greek speakers. Each translator produced an independent forward translation of the original items, instructions, and response choices. After this, both translators and the local coordinators, L.M. and E.I.P., agreed on a reconciled version.

Phase 2: backward translation step

At this step, A.S.—a bilingual physician with experience in professional medical translations—back-translated the questionnaire into English, providing Version 2 of the questionnaire. Differences that occurred between the two English versions were then assessed. Subsequently, the author of the original MENQOL—Dr Jacqueline E. Lewis—revised Version 2 and provided her feedback, which we took into consideration and provided an improved version of the questionnaire.

Phase 3: patient testing

The Greek-translated MENQOL was pilot-tested on a panel of five menopausal women experiencing hot flashes. The participants were all native Greek speakers, randomly chosen from women attending a specialized menopause clinic. These women were aged 48 to 61 years and were 1.5 to 10 years postmenopause. Additionally, they had never been on hormone therapy (HT). They were all healthy and able-bodied, and they were not familiar with the questionnaire. The comprehension test was performed through individual interviews during which the interviewer (E.I.P.) inquired whether the participant had any difficulty in understanding the
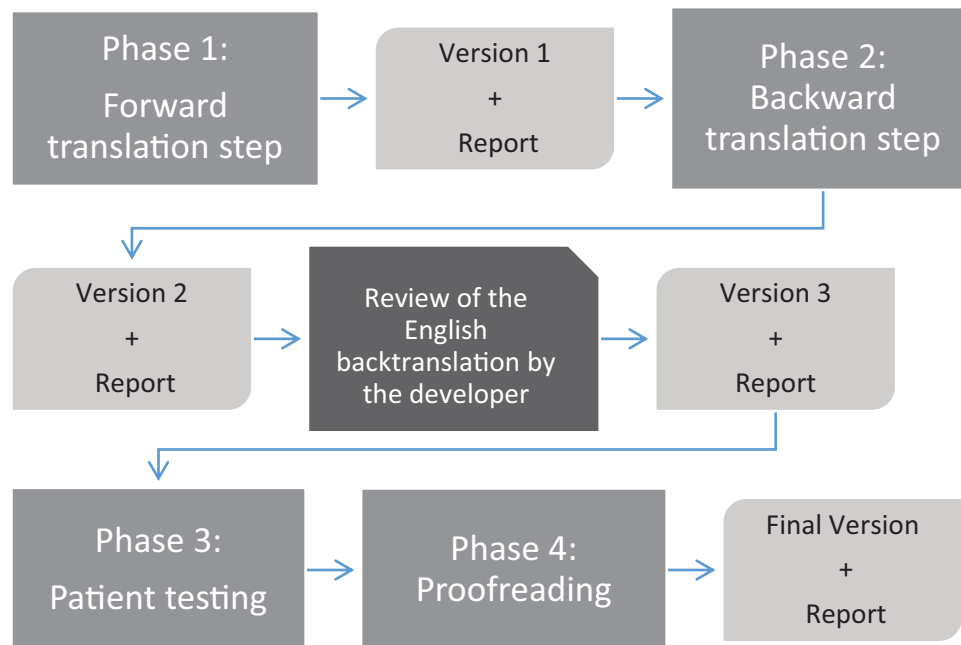

FIG. 1. Algorithm of the linguistic validation of the MENQOL.

questionnaire and checked the participant's interpretation of all items. In questions that were not clearly understood, the interviewer proposed test alternatives of translations and/or asked the participant to propose alternatives.

One major concern with the wording of the questionnaire was relating to items 11 and 23, as all women were confused and found that the two items were similar, if not identical, in meaning. Looking at the two items again, we suggested to clarify that item 11 refers to gas-related pain (''πόνος από αέρια''), and changed question 23 to include a word that more specifically described swelling of the abdominal area (''αισθάνομαι πρησμένη στην κοιλιά''), which was not linked to excessive abdominal wind, like the previously used word ''αίσθημα φουσκώματος.'' We therefore changed the final version of the questionnaire using this alternative.

Phase 4: proofreading

Based on this, we modified the original translation, which was then assessed for grammatical and syntax errors by a professional in Greek linguistics.

The questionnaire was also transcripted electronically, using the Survey Monkey platform. After this, we generated screen captures (screenshots) of the original questionnaire as displayed on screen and sent them to Mapi Research Trust for approval.

Validation

We conducted a cross-sectional study between April, 2018 and December, 2018. Women were recruited during routine visits either at community health centers or a specialized clinic for the Menopause and Climacteric. We also advertised our study intention on the National School of Public Health website. We aimed for a convenience sample of 100 to 120 women, without previous power calculation. The study was approved by the scientific board of Alexandra Hospital (approval number 74/26-01-2018). All participants gave written informed consent.

We included women aged 45 to 65 years, at least 1 year into natural menopause, who complained of any symptoms that they attributed to the menopause.

Exclusion criteria were a history of hysterectomy, HT, and diagnosis of a medical condition requiring regular hospitalizations or medical treatment, such as renal or hepatic disease, cancer, mental illness, uncontrolled endocrine conditions, and rheumatic or cardiovascular disease.

The MENQOL was used to assess the QoL of participants. It was a self-administered questionnaire and consisted of a total of 29 items in four domains: vasomotor (items 1-3), psychosocial (items 4-10), physical (items 11-26), and sexual (items 27-29). For each item, participants were asked to indicate if they had experienced each symptom or problem within the past month, and, if so, to rate how bothered they were on a 0 (not at all bothered) to 6 (extremely bothered) 7-point Likert scale.[4] If the answer for an item was ''no,'' it was scored as ''1.'' Scores on all items ranged from 1 to 8. Each domain was scored separately; there was no overall score.

Each domain score was the average of the item scores in that domain (higher scores indicated poorer QoL).[4,5]

The questionnaire was completed on site, and women had the opportunity to ask for clarifications. Thirty two participants were asked to complete an electronic form as well, either before or after completion of the written form. Finally, 25 completed both questionnaires; 14 completed the written and 11 completed the online questionnaire first. In all cases, this was obtained with a time gap ranging between 15 and 30 days.

Data were analyzed by SPSS 17.0. Variables were described using mean values (mean ± SD), and also absolute numbers and relative frequencies. Statistical significance was set at 0.05.

The percentage of missing responses ranged from 0% (ie, no missing) to 3.4% of the entire MENQOL questionnaire. Higher (>1%) percentages of missing data were observed for questions q3 and q24 for women without any medical/surgical history of note, and q28, q4, q27, and q29 for those with medical/surgical history. The missing data were handled appropriately. The imputed score was calculated from values converted for analysis according to previous scoring guidelines.[5] Item scores were imputed only if the participant had responded to more than half of the domain items, otherwise the questionnaire was considered invalid. If the participant answered ''yes,'' but did not indicate ''how bothered'' she was, the value was imputed from the mean of her scores for all ''yes'' answers within that domain. In the case where the item was missed completely, the imputed value was the mean for that item generated from other women's responses.[5]

To validate the translated questionnaires, the following tests were undertaken: internal consistency (interclass correlation [ICC]) and stability (test-retest reliability) with the calculation of Cronbach's alpha correlations for all domains. Independent *t* tests were used to compare the differences between responders and nonresponders, and between women with or without medical/surgical history. Paired *t* test was used to compare the differences between the two forms of the questionnaire (written and online). Pearson's correlation coefficients were calculated between MENQOL domains and age, body mass index (BMI), and menopause period. Analysis of variance (ANOVA) *F* test was performed to compare sexual domain scores by marital status.

RESULTS

A total of 163 menopausal women were approached. Twelve women (7.36%) declined to participate, giving a response rate of 92.64%. Of the 151 women recruited, 4 were excluded because of invalid questionnaires and 42 for meeting one or more of the exclusion criteria. Therefore, 105 women were included in the data analysis. The sample characteristics and the information about nonresponders are presented in Table 1. There were no statistically significant differences between responders and nonresponders in all parameters assessed, except education. Forty five participants had a positive medical or surgical history, including a mild or

TABLE 1. *General description of participants (responders-nonresponders)*

	Responders (n = 105)	Nonresponders (n = 12)	Comparison	Total (N = 117)
Age[a] (y)	56.3 (4.62)	56.8 (6.74)	Two independent-samples *t* test P = 0.818	56.4 (4.95)
Menopause age[a] (y)	48.7 (5.01)	48.2 (5.34)	Two independent-samples *t* test P = 0.772	48.6 (5.14)
Menopause period[a] (y)	8.1 (7.04)	8.6 (6.74)	Two independent-samples *t* test P = 0.820	8.1 (7.07)
Weight[a] (kg)	68.4 (12.08)	NA		
Height[a] (cm)	1.62 (0.060)	NA		
BMI[a] (kg/m²)	26.3 (5.04)	NA		
Waist circumference[a] (cm)	87.1 (15.25)	NA		
Hip circumference[a] (cm)	100.8 (17.66)	NA		
WHR[a]	0.86 (0.171)	NA		
Body fat[a] (%)	34.8 (7.95)	NA		
Breast mammography[b]		NA		
Yes	100 (97.1%)			
No	3 (2.9%)			
Smoking[b]		NA		
Yes	32 (30.5%)			
No	73 (69.5%)			
Number of cigarettes[b]		NA		
1≤ up to <10	8 (25%)			
10≤ up to <20	8 (25%)			
≥20	16 (50%)			
Education level[b]				
High School	39 (40.2%)	2 (22.2%)	Pearson chi-square P = 0.051	41 (38.7%)
University/Master	45 (46.4%)	3 (33.3%)		48 (45.3%)
Other	13 (13.4%)	4 (44.4%)		17 (16.0%)
Occupation level[b]				
Unemployed	11 (10.7%)	2 (20.0%)	Pearson chi-square P = 0.206	13 (11.5%)
Civil servant/private employee	57 (55.3%)	2 (20.0%)		59 (52.2%)
Domestically	12 (11.7%)	2 (20.0%)		14 (12.4%)
Retired	23 (22.3%)	4 (40.0%)		27 (23.9%)
Marital status[b]				
Unmarried/divorced/widowed	20 (19.6%)	4 (40.0%)	Pearson chi-square P = 0.134	24 (21.4%)
Married	82 (80.4%)	6 (60.0%)		88 (78.6%)
Residence[b]				
Athens	125 (84.5%)			
Other	23 (15.5%)			

The data were collected from April, 2018 to December, 2018.
BMI, body mass index; NA, not available data; WHR, waist-to-hip ratio.
[a]Values are mean and standard deviation of mean.
[b]Values are count and percent.

well-controlled health condition, such as thyroid disease (21), hypercholesterolemia (11), hypertension (9), asthma (4), osteoporosis (3), type II diabetes mellitus (3), chronic obstructive pulmonary disease (1), and a history of myomectomy (4). Comparison of MENQOL domain scores between women with a positive medical/surgical history and healthy women or women with well-regulated conditions did not yield statistically significant differences (Table 2). Based on this, we decided to exclude women with a severe positive medical/surgical history and include in the analysis only those with a chronic and well-regulated condition.

Reliability

To assess internal consistency reliability, we measured Cronbach's alpha for each domain and the entire MENQOL. Because questions in each domain should cover one specific

TABLE 2. *Comparison of MENQOL domain scores by medical/surgical history*

Domain	Medical or surgical history	n	Mean	SD	Two independent samples *t* test, *P*
Vasomotor (q1-q3)	No	105	3.08	2.05	0.894
	Yes	43	3.13	2.11	
Psychosocial (q4-q10)	No	105	3.41	1.40	0.301
	Yes	43	3.10	1.72	
Physical (q11-q26)	No	105	3.52	2.17	0.488
	Yes	43	3.19	1.35	
Sexual (q27-q29)	No	105	3.80	2.35	0.116
	Yes	43	3.28	2.45	
Total MENQOL (q1-q29)	No	105	3.45	2.62	0.292
	Yes	43	3.20	2.43	

Higher score means more bothersome symptoms/domain.
MENQOL, Menopause-specific Quality of Life; SD, standard deviation

TABLE 3. *Internal consistency reliability of the MENQOL*

Cronbach's alpha	Vasomotor (q1-q3)	Psychosocial (q4-q10)	Physical (q11-q26)	Sexual (q27-q29)	Total MENQOL (q1-q29)
Written	0.896	0.835	0.833	0.866	0.907
Online	0.868	0.744	0.720	0.831	0.847

MENQOL, Menopause-specific Quality of Life.

concept,[4] we expected strong inter-relationship among them. Cronbach's alpha values were 0.833 and 0.896 for the written, and 0.720 and 0.868 for the online questionnaire (Table 3). The domain with the lowest Cronbach's alpha for both forms of the questionnaire was the physical domain. The domain with the highest Cronbach's alpha for both forms was the vasomotor domain.

Test-retest

Twenty eight women completed the questionnaire in both the written and online form. Three were excluded because of invalid questionnaires. Fourteen completed the written questionnaire first followed by the online and 11 did it vice versa. Because there was no intervention between the two completions, test-retest reliability was determined by domain, using intraclass correlation coefficients.

Interclass correlation, single measures, and average measures absolute agreement

We examined ICC, using Pearson's correlation with 95% confidence interval (CI). We used an arbitrary cut-off of ICC <0.5. The ICC was below 0.5 for 4 out of 29 items. Cronbach's alpha for each item was assessed using the written version of the questionnaire.

The ICC was then repeated on a domain basis, to assess agreement of average measures. The results were acceptable. ICC was >0.70 for all domains and 0.80 for the whole MENQOL (Table 4).

Finally, paired t tests were performed to compare MENQOL domain scores for the written and the online form of the questionnaire of the same participants. There was no statistically significant difference in the individual scores between written and electronic questionnaires ($P = 0.803$). Both forms presented consistent levels of reliability which were generally high (Table 5).

The QoL of Greek menopausal women

According to the scoring results of MENQOL, the sexual domain had the higher mean (3.80 ± 2.35), indicating the highest impact on QoL, followed by the physical symptoms' domain (3.52 ± 2.17), then the psychosocial (3.41 ± 1.40), and last, the vasomotor (3.08 ± 2.05) domain (Table 6).

No correlation was found between MENQOL domains and BMI, age, and menopause period (Supplemental Table 1, http://links.lww.com/MENO/A559).

There was no statistically significant difference in MENQOL sexual domain scores by marital status (one-way ANOVA P value = 0.607) (Table 7).

Frequently identified issues for women

The most frequently identified issues on the MENQOL are listed with descending order of magnitude (Supplemental Table 2, http://links.lww.com/MENO/A560). The most frequent complaints were feeling anxious or nervous (423), weight gain (414), and aching in muscle and joints (409).

DISCUSSION

In the present cross-sectional study, we aimed to translate the MENQOL and validate it for usage among Greek menopausal women. Our team translated and adapted the questionnaire in Greek and tested the acquired version in a Greek population, in both paper and electronic form. The results demonstrated that the MENQOL is a valid and reliable

TABLE 4. *Interclass correlation (ICC) single measures absolute agreement between written and online questions for the same respondent, and average measures absolute agreement*

Item, domain	ICC	95% CI	Cronbach's alpha
MENQOL 1, vasomotor domain	0.82	(0.65-0.91)	0.85
MENQOL 2, vasomotor domain	0.61	(0.32-0.80)	0.74
MENQOL 3, vasomotor domain	0.26	(−0.11 to 0.57)	0.37
MENQOL 4, psychosocial domain	0.64	(0.36-0.81)	0.78
MENQOL 5, psychosocial domain	0.52	(0.19-0.74)	0.69
MENQOL 6, psychosocial domain	0.54	(0.22-0.76)	0.75
MENQOL 7, psychosocial domain	0.65	(0.38-0.82)	0.77
MENQOL 8, psychosocial domain	0.79	(0.60-0.90)	0.88
MENQOL 9, psychosocial domain	0.60	(0.29-0.79)	0.74
MENQOL 10, psychosocial domain	0.75	(0.54-0.87)	0.81
MENQOL 11, physical domain	0.33	(−0.04 to 0.62)	0.50
MENQOL 12, physical domain	0.75	(0.53-0.87)	0.90
MENQOL 13, physical domain	0.47	(0.13-0.71)	0.60
MENQOL 14, physical domain	0.39	(0.03-0.66)	0.49
MENQOL 15, physical domain	0.64	(0.36-0.81)	0.77
MENQOL 16, physical domain	0.61	(0.32-0.80)	0.73
MENQOL 17, physical domain	0.54	(0.22-0.76)	0.75
MENQOL 18, physical domain	0.69	(0.44-0.84)	0.79
MENQOL 19, physical domain	0.69	(0.44-0.84)	0.76
MENQOL 20, physical domain	0.86	(0.72-0.93)	0.93
MENQOL 21, physical domain	0.62	(0.33-0.80)	0.79
MENQOL 22, physical domain	0.69	(0.44-0.84)	0.86
MENQOL 23, physical domain	0.79	(0.60-0.90)	0.90
MENQOL 24, physical domain	0.63	(0.35-0.81)	0.78
MENQOL 25, physical domain	0.60	(0.30-0.79)	0.73
MENQOL 26, physical domain	0.52	(0.19-0.74)	0.77
MENQOL 27, sexual domain	0.71	(0.47-0.85)	0.87
MENQOL 28, sexual domain	0.75	(0.53-0.87)	0.85
MENQOL 29, sexual domain	0.58	(0.27-0.78)	0.73
Vasomotor	0.70	(0.45-0.85)	0.81
Psychosocial	0.83	(0.67-0.92)	0.90
Physical	0.80	(0.62-0.90)	0.88
Sexual	0.79	(0.59-0.90)	0.87
Total MENQOL	0.80	(0.62-0.90)	0.88

MENQOL, Menopause-specific Quality of Life.

TABLE 5. *Paired t test for MENQOL domain scores*

Domain score	Group	Mean
Vasomotor (q1-q3)	Written (n = 25)	3.02
	Online (n = 25)	2.93
	Mean difference (95% CI for mean difference)	0.093 (−0.538 to 0.725)
	P	0.597
Psychosocial (q4-q10)	Written (n = 25)	3.05
	Online (n = 25)	3.00
	Mean difference (95% CI for mean difference)	0.049 (−0.328 to 0.426)
	P	0.791
Physical (q11-q26)	Written (n = 25)	3.01
	Online (n = 25)	3.04
	Mean difference (95% CI for mean difference)	−0.034 (−0.296 to 0.228)
	P	0.803
Sexual (q27-q29)	Written (n = 25)	3.15
	Online (n = 25)	3.24
	Mean difference (95% CI for mean difference)	−0.092 (−0.578 to 0.388)
	P	0.621
Total MENQOL	Written (n = 25)	3.05
	Online (n = 25)	3.03
	Mean difference (95% CI for mean difference)	0.016 (−0.297 to 0.301)
	P	0.803

MENQOL, Menopause-specific Quality of Life.

instrument for evaluating Greek menopausal women. The internal consistency of the questionnaire was high in all domains, and the entire questionnaire performed well in both forms, confirming its reliability and acceptability. The validity and reliability of the Greek-translated questionnaire are similar to previously translated versions[8-10] for the written form, and slightly lower for the online form.[8]

Looking closely at the results, responses in the paper format were more consistent than the online form. This may be due to the fact that women had the opportunity to seek help when completing the written form. Nevertheless, consistency in the online form remained acceptable.

It is worth mentioning that the agreement between electronic and written answers was lower for four questions (q3, q11, q13, q14). However, differences resolved when the agreement of domains was checked. With regards to agreement of average measures, both ICC and Cronbach's alpha gave very high agreement. Any difference was eliminated, and overall there was good reliability.

We strongly believe that the availability in an online form will allow better dissemination of the questionnaire. Given that older women in Greece are gradually becoming accustomed to social and electronic media, having an electronic form would increase availability and acceptability of the

TABLE 6. *The QoL of Greek menopausal women*

Domain	n	Mean (SD)	Min-Max
Vasomotor	105	3.08 (2.05)	1-8
Psychosocial	105	3.41 (1.40)	1-7.57
Physical	105	3.52 (2.17)	1-6.20
Sexual	105	3.80 (2.35)	1-8

QoL, quality of life.

TABLE 7. *Descriptive statistics of sexual domain score by marital status*

Sexual domain/marital status	n	Mean (SD)	Min-Max	95% CI
Unmarried	4	3.28 (1.265)	(1-8)	(2.04-4.52)
Married	78	3.84 (1.761)	(1-8)	(3.45-4.23)
Divorced	13	3.63 (2.156)	(2-8)	(2.46-4.80)
Widowed	2	3.12 (2.821)	(1-5)	(0-7.03)

One-way ANOVA, P value = 0.607.
CI, confidence interval; SD, standard deviation.

questionnaire. According to NapoleonCat.com, in September, 2019, 11.57% of women in Greece aged 45 to 64 years were social media and network sites users, such as Facebook, Instagram, and Messenger.[11] According to the Hellenic Statistic Authority, more than half of online access in Greek households relates to health information.[12] It would thus be possible to use it more widely among menopausal women, to identify those in need for specific management. According to the European Council, information technologies used in the field of health can boost the development and implementation of innovative data-driven technological solutions that will result in better health outcomes and improved QoL for patients.[13] To our knowledge, this was the first attempt at validating the MENQOL in an electronic form, although the online form of the MENQOL may not be quite ready for implementation.

So far, MENQOL has been translated in more than 15 languages, and the forms can be accessed freely for academic use. Looking at the literature, MENQOL has been validated for use in the Chinese, Iranian, Serbian, and French-Canadian populations, and has been shown to have adequate acceptability, validity, and reliability.[8,14-16]

The mean age of participants in our study was 56 years. The majority were recently menopausal. Although MENQOL originally targeted women in their early menopause, its use in women over 62 years of age has been demonstrated by investigators,[17] and thus it is recommended for use in women from 40 to 65 years of age.[6] Age or duration of menopause did not have an impact on QoL, in agreement with findings in the Iranian population.[18]

Most of our participants were overweight and obese, whereas more than half had an abnormally high percentage of body fat. We believe that this is representative of Greek menopausal women in this respect, as previous studies in Greece have presented similar results.[19-21] We could not identify a link between a higher BMI and bothersome VMS or QoL as shown by others.[18,22]

The Greek validation identified certain areas of minor concern. For example, questions on urinary symptoms performed less well, possibly due to the fact that women were less eager to report on those symptoms. However, MENQOL acts as a more holistic screening tool and aims at identifying a wide array of problems during menopause. Urinary incontinence and pelvic floor disorders may require specifically designed questionnaires. There are indeed validated questionnaires in Greek for this purpose, and they may be used in

conjunction with MENQOL to increase identification of urinary symptoms in this age group.[23]

Menopause is now widely recognized to have an effect on QoL. A large British study found that menopausal symptoms are strongly related to all aspects of health functioning.[24] The existence of menopause-associated depression remains controversial. Changes in sex hormones and particularly hypoestrogenism may affect QoL,[25] but other factors may influence emotional status at this stage in life, including cardiovascular issues, VMS, sleep problems, and stressful life events.[26]

Reports on QoL in Greek menopausal women have so far been reassuring. In 2006, a study found that postmenopausal Greek women using HT had a better self-reported QoL than those who did not.[27] In 2012, a large population study using the Utian Quality of Life Scale (UQOL) found that menopause as a life event has no effect on the QoL of Greek middle-aged women.[20] This agrees with findings in the general population in Greece, where self-reported health is among the best in the European Union.[28]

Although previous studies appear to produce reassuring results on QoL in Greek menopausal women, MENQOL could serve to identify more subtle nuances of QoL that would not come up on generic QoL questionnaires. Furthermore, MENQOL could serve as a tool to screen for symptoms related to the menopause that are either not perceived as medical concerns or are embarrassing to discuss with a physician. In its electronic form, in particular, it can be completed easily and discreetly, allowing the health professional to identify physical and mental health areas that can be improved.

Many symptoms of the menopause, such as body aches, anxiety, or weight gain, may not be perceived to be linked to the menopause, and others, such as vaginal dryness, may be thought to be an irreversible effect of ageing with no solution. The latter, in particular, was specifically mentioned by women during the pilot stage of the translation. Nevertheless, behavioral therapy,[29,30] diet and lifestyle modifications,[31,32] and systemic or local estrogen treatment[33,34] may alleviate many of the bothersome symptoms of the menopause.

The MENQOL questionnaire could act as a platform and an incentive for both women and doctors to discuss issues that would otherwise remain undisclosed and not addressed. In our study, the three symptoms with the highest degree of bother were ''feeling anxious or nervous,'' ''weight gain,'' and ''aching in muscles and joints''; these, along with sexual changes (interest in sex and intimacy), were the issues that resulted in the highest bothersome ratings in other groups of menopausal women.[9] Given that other questionnaires used in Greek menopausal populations, such as the UQOL and the Greene Climacteric Scale, do not assess weight gain as a concern,[20,27] we could conclude than MENQOL could be more appropriate for identifying menopausal issues.

The sexual domain had the most important impact on QoL among the women we studied, similarly to what has been shown by Paulose and Kamath[35] in 2018. In particular,

married women appeared to fare worse, and this comes in contrast with previous studies that have looked at sexual satisfaction among menopausal women.[36] A possible explanation may be that we did not differentiate between sexually and nonsexually active women, but only recorded whether they had a partner or not, whereas the study by McCall-Hosenfeld et al[36] assessed sexually active women only, to rate their satisfaction. We did not evaluate rates of sexual activity among participants, because MENQOL is not designed to determine detailed aspects of sexual satisfaction. Other questionnaires, such as the FSFI, which has been validated in a Greek population,[37] may be used in conjunction with MENQOL when more details on sexual satisfaction are sought.

The vasomotor symptoms' domain came last in our study, probably as we did not solely look at women recently into the menopause. We also specifically excluded women with an iatrogenic menopause, where the most bothersome symptoms are usually vasomotor, followed by sexually-related ones.[9]

The relatively small number of participants may be a limitation of this study. However, we intended to obtain the highest homogeneous group of women possible, to formally evaluate and validate the questionnaire. We specifically excluded women taking HT, local estrogen, or those on antidepressants and anxiolytics. These women, along with women suffering with major medical problems, formed almost one-third of our original cohort. We decided to include women with minor medical problems, as they did not differ significantly from healthy women. This does not preclude the use of the Greek questionnaire for menopausal women with complex medical issues in the future, as has been the case in its original English format.[9,10]

Another limitation is that our services are based in Athens, and therefore, we mostly included women living in the Athens Metropolitan area (84.5%). However, approximately three quarters of the Greek population lives in urban areas, and according to the 2011 inventory, 35% of female women aged 45 to 65 years were living in Athens.[38] Furthermore, a recent study looking at QoL in Asian menopausal women found no difference between women living in urban and rural areas.[35] The fact that we mostly included women from urban areas may explain why the majority of them were educated.

Finally, the fact that retesting was done with the two versions of the questionnaire may be considered a limitation. Indeed, some of the variance observed may result from the use of the two formats. In addition, reliability over time of the MENQOL is complicated by the use of the two forms of the questionnaire on two separate occasions. However, as both forms of the questionnaire were found to be consistent and acceptable, we believe this has not biased our results significantly.

CONCLUSIONS

The MENQOL is a clinical tool that does not clinically rate symptoms, rather records the presence or absence of specific symptoms and assesses their impact by asking how bothersome those symptoms are. Greek-translated MENQOL is a

valid and reliable instrument for evaluating Greek menopausal women. Further use of the questionnaire in Greece will lead to better understanding of the bothersome symptoms of menopause, so as to offer consultations to menopausal women and develop intervention studies for amelioration of QoL.

REFERENCES

1. NCC-WCH. *Menopause Full Guideline: Clinical Guideline Methods, Evidence and Recommendations, Version 1.5*. UK: National Collaborating Centre for Women's and Children's Health; 2015; 11.
2. Jenabi E, Shobeiri F, Hazavehei S, Roshanaei G. Assessment of questionnaire measuring quality of life in menopausal women: a systematic review. *Oman Med J* 2015;30:151-156.
3. WHOQOL Group. Programme on Mental Health WHOQOL, Measuring Quality of Life. Geneva: WHO/MSA/MNH/PSF/97.4; 1997. Available at: https://www.who.int/mental_health/media/68.pdf. Accessed October 12, 2019.
4. Hilditch JR, Lewis J, Peter A, et al. A menopause-specific quality of life questionnaire: development and psychometric properties. *Maturitas* 1996;24:161-175.
5. Lewis JE, Hilditch JR, Wong CJ. Further psychometric property development of the Menopause-Specific Quality-of-Life questionnaire and development of a modified version, MENQOL-Intervention questionnaire. *Maturitas* 2005;50:209-221.
6. Sydora BC, Fast H, Campbell S, et al. Use of the Menopause-Specific Quality of Life (MENQOL) questionnaire in research and clinical practice: a comprehensive scoping review. *Menopause* 2016;23:1038-1051.
7. Mapi Research Trust, Home, Instruments, MENQOL-Menopause Specific Quality of Life Questionnaire; 2019. Available at: https://eprovide.mapi-trust.org/instruments/menopause-specific-quality-of-life-questionnaire#-languages. Accessed November 1, 2019.
8. Guangning N, Hongyan Y, Jian L, ChuMei Z, Xiaoyun W. Psychometric properties of the Chinese version of the Menopause-Specific Quality-of-Life questionnaire. *Menopause* 2017;24:546-554.
9. Dolye C, Adams L, McAndrew A, et al. Validation of the MENQOL for use with women who have been treated for gynecologic or breast cancer. *Can Oncol Nurs J* 2018;28:228-233.
10. Hasan SS, Ahmadi K, Santigo R, Ahmed SI. The validity of the menopause-specific quality of life questionnaire in women with type 2 diabetes. *Climacteric* 2014;17:456-464.
11. Napoleoncat., Statistics, Social media users in Greece; 2019. Available at: https://napoleoncat.com/stats/social-media-users-in-greece/2019/09. Accessed November 1, 2019.
12. Hellenic Statistical Authority, ELSTAT, Use of Information and Communication Technologies by Households and Individuals (ICT); 2018. Available at: https://www.statistics.gr/el/infographic-information-technologies-2018. Accessed November 1, 2019.
13. Overview of the national laws on electronic health records in the EU Member States and their interaction with the provision of cross-border eHealth services Final report and recommendations; 2014. Available at: https://ec.europa.eu/health/sites/health/files/ehealth/docs/laws_report_recommendations_en.pdf. Accessed November 1, 2019.
14. Hossien Fallahzadeh Quality of life after the menopause in Iran: a population study. *Qual Life Res* 2010;19:813-819.
15. Gazibara T, Kovacevic N, Nurkovic S, et al. Menopause-specific Quality of Life Questionnaire: factor and Rasch analytic approach. *Climacteric* 2019;22:90-96.
16. Blumel JE, Castelo-Branco C, Binfa L, et al. Quality of life after the menopause: a population study. *Maturitas* 2000;34:17-23.
17. Kulasingam S, Moineddin R, Lewis JE, Tierney MC. The validity of the Menopause Specific Quality of Life Questionnaire in older women. *Maturitas* 2008;60:239-243.
18. Shobeiri F, Jenabi E, Hazavehei SM, Roshanaei G. Quality of life in postmenopausal women in Iran: a population-based study. *J Menopausal Med* 2016;22:31-38.
19. Yannakoulia M, Melistas L, Solomou E, Yiannakouris N. Association of eating frequency with body fatness in pre-and postmenopausal women. *Obesity* 2007;15:100-106.
20. Giannouli P, Zervas I, Armeni E, et al. Determinants of quality of life in Greek middle-age women: a population survey. *Maturitas* 2012;71:154-161.
21. Papavagelis C, Avgeraki E, Augoulea A, Stamatelopoulos K, Lambrinoudaki I, Yannakoulia M. Dietary patterns, Mediterranean diet and obesity in postmenopausal women. *Maturitas* 2018;110:79-85.
22. Koo S, Ahn Y, Lim JY, Cho J, Park HY. Obesity associates with vasomotor symptoms in postmenopause but with physical symptoms in perimenopause: a cross-sectional study. *BMC Womens Health* 2017;17:126.
23. Athanasiou S, Grigoriadis T, Kyriakidou N, Giannoulis G, Antsaklis A. The validation of international consultation on incontinence questionnaires in the Greek language. *Neurol Urodyn* 2012;31:1141-1144.
24. Meena K, Mai S, Michael M. The menopausal transition was associated in a prospective study with decreased health functioning in women who report menopausal symptoms. *J Clin Epidemiol* 2005;58:719-727.
25. Caruso S, Cianci S, Amore FF, et al. Quality of life and sexual function of naturally postmenopausal women on an ultralow-concentration estriol vaginal gel. *Menopause* 2016;23:47-54.
26. Soares CN. Depression and menopause. *Psychiatr Clin North Am* 2007;40:239-254.
27. Koundi KL, Christodoulakos GE, Lambrinoudaki IV, et al. Quality of life and psychological symptoms in Greek postmenopausal women: association with hormone therapy. *Gynecol Endocrinol* 2006;22:660-668.
28. European Foundation for the Improvement of Living and Working Conditions, Living and working in Greece. Eurofound; 2017. Available at: https://www.eurofound.europa.eu/country/greece. Accessed November 1, 2019.
29. Carmody JF, Crawford S, Salmoirago-Blotcher E, Leung K, Churchill L, Olendzki N. Mindfulness training for coping with hot flashes: results of a randomized trial. *Menopause* 2011;18:611-620.
30. van Driel C, de Bock GH, Schroevers MJ, Mourits MJ. Mindfulness-based stress reduction for menopausal symptoms after risk-reducing salpingo-oophorectomy (PURSUE study): a randomised controlled trial. *BJOG* 2019;126:402-411.
31. Kalra B, Agarwal S, Magon S. Holistic care of menopause: understanding the framework. *J Midlife Health* 2012;3:66-69.
32. Mintziori G, Lambrinoudaki I, Goulis DG, et al. EMAS position statement: non-hormonal management of menopausal vasomotor symptoms. *Maturitas* 2015;81:410-413.
33. Baber RJ, Panay N, Fenton A. The IMS Writing Group (2016): 2016 IMS Recommendations on women's midlife health and menopause hormone therapy. *Climacteric* 2016;19:109-150.
34. NAMS. 2017 Hormone Therapy Position Statement. *Menopause* 2017;24:728-753.
35. Paulose B, Kamath N. Quality of life of postmenopausal women in urban and rural communities. *J Menopausal Med* 2018;24:87-91.
36. McCall-Hosenfeld JS, Jaramillo SA, Legault C, et al. Correlates of sexual satisfaction among sexually active postmenopausal women in the Women's Health Initiative-Observational Study. *J Gen Intern Med* 2008;23:2000-2009.
37. Zachariou A, Filiponi M, Kirana PS. Translation and validation of the Greek version of the female sexual function index questionnaire. *Int J Impot Res* 2017;29:171-174.
38. Hellenic Statistical Authority Demographic characteristics/2011. ELSTAT. Available at: http://www.statistics.gr/en/statistics/-/publication/SAM03/2011. Accessed November 1, 2019.