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The Menopause-Specific Quality of Life (MENQOL) Questionnaire: Psychometric Evaluation among Breast Cancer Survivors

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Abstract

Objective—To evaluate the psychometric properties of the Menopause-Specific Quality of Life (MENQOL) Questionnaire in a sample of breast cancer survivors experiencing menopausal symptoms.

Methods—This was a secondary analysis of MENQOL psychometric data from two larger parent studies investigating acupuncture for the relief of menopausal symptoms among breast cancer survivors. Reliability was assessed for each subscale of the MENQOL via: 1) internal consistency reliability with Cronbach's α, and 2) test-retest reliability at multiple follow-up points with intra-class correlation coefficients (ICCs) and *r*. Convergent and discriminant validity were assessed via correlations of the vasomotor and psychosocial MENQOL subscales with select items in the Kupperman Index and Daily Symptom Diary. A principal components analysis (PCA) was performed to determine construct validity.

Results—For each subscale, Cronbach's α was ≥ 0.70. All subscale test-retest reliabilities at first follow-up were significant and at least moderately correlated ≥ 0.450 (*r*'s and ICCs). Convergent validity was moderate between the vasomotor and psychosocial subscales and the symptom diary (*r*'s ≥ 0.410, *p*'s < 0.001), and larger between these domains and the Kupperman Index (*r*'s ≥ 0.614, *p*'s < 0.001). In the same subscales, discriminant validity was supported by low, non-significant correlations (*r*'s ≤ 0.176, *p*'s > 0.05). The PCA revealed a latent structure nearly identical to the pre-specified instrument domains, with the exception of the physical domain.

Conclusions—With results comparable to those obtained in previous psychometric work, the MENQOL appears to be a reliable and valid instrument to assess quality of life in post-menopausal breast cancer survivors.

Keywords

menopause; quality of life; breast cancer; psychometrics; factor analysis

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1. Introduction

The Menopause-Specific Quality of Life Questionnaire (MENQOL) was introduced in 1996 as a tool to assess health-related quality of life in the immediate post-menopausal period. An inherent assumption of the MENQOL is that disease states and conditions like menopause, which produce symptoms, may disrupt emotional, physical, and social aspects of an individual's life, which must be considered concomitantly with treatment decisions. The MENQOL improves upon several instruments used to assess the impact of menopausal symptoms on quality of life, including the Kupperman Index and the General Well-Being Scale, in the following ways: 1) specificity to the condition of menopause; 2) item development based upon women's own qualitative and quantitative accounts of menopausal symptoms; 3) inclusion of all pertinent domains of the menopause experience, including sexual symptoms; and 4) demonstrated reliability and validity.[1]

The MENQOL is self-administered and consists of a total of 29 items in a Likert-scale format. Each item assesses the impact of one of four domains of menopausal symptoms, as experienced over the last month: vasomotor (items 1–3), psychosocial (items 4–10), physical (items 11–26), and sexual (items 27–29). Items pertaining to a specific symptom are rated as present or not present, and if present, how bothersome on a zero (not bothersome) to six (extremely bothersome) scale.[1,2] Means are computed for each subscale by dividing the sum of the domain's items by the number of items within that domain.2 Non-endorsement of an item is scored a "1" and endorsement a "2," plus the number of the particular rating, so that the possible score on any item ranges from one to eight.

Despite the MENQOL's widespread use and established reliability and validity among women experiencing naturally-occurring menopause,[1,2] its psychometric properties have not been evaluated in a population of breast cancer survivors. Yet menopause frequently occurs as a result of cancer treatment, including chemotherapy, radiation, oophorectomy, and hysterectomy. Although the prevalence of and physiological mechanism inducing menopausal symptoms is thought to be similar between naturally-occurring and treatment-induced menopause,[3,4] the transition may be accelerated[4–6] and symptoms intensified[7] in those who have undergone cancer therapy. Numerous qualitative and quantitative accounts corroborate the negative impact of menopausal symptoms in this group on quality of life.[5, 8–13]

2. Methods

The purpose of this analysis was to evaluate the psychometric properties of the MENQOL in a sample of breast cancer survivors experiencing menopausal symptoms, enabling an appraisal of the instrument's usability in such a population. MENQOL data were combined from two separate, consecutive randomized placebo-controlled trials examining the effectiveness of acupuncture on menopausal symptoms in women previously treated for breast cancer. Both studies compared quality of life and reduction in menopausal symptom frequency and severity among participants randomized to one of three conditions: an education control, an acupuncture body site-specific intervention, or an acupuncture body site-nonspecific placebo. Frequency and severity of menopausal symptoms were measured via daily symptom diaries, the Kupperman Index, and the MENQOL, all administered at baseline, as well as at various follow-up points throughout each study. "Study 1" followed participants (n= 39) over 26 weeks, administering the MENQOL at baseline and weeks 11 and 26. "Study 2" followed participants (n = 69) over 22 weeks, administering the MENQOL at baseline and weeks 5, 9, and 22.

A total of 108 participants were included in baseline analyses. Two participants were lost to follow-up within the combined education control, the group used to determine test-retest reliability. Participants with missing data for a particular analysis were excluded from that analysis. To minimize confounding of quality of life assessment with cancer treatment, participants in each study must not have been undergoing active chemotherapy at time of enrollment. Potential participants were also excluded if they screened positive for depression at baseline via the Center for Epidemiologic Studies Depression Scale, or had undergone acupuncture or taken any hormonal or herbal supplements within the previous three months. Eligibility requirements included endorsement of hot flashes, as identified on the baseline symptom diary, and treatment for breast cancer within the last 12 months.

2.1 Baseline Data Screening

Age, age at menopause, time since last menstrual period (LMP), menopause etiology, any chemotherapy, stage of breast cancer at diagnosis, and type of breast cancer were assessed and compared between the two studies using means, standard deviations, and independent samples t-tests for continuous data and percentages and chi-square tests for categorical data. For each instrument item, univariate normality was assessed through Shapiro-Wilkes tests and visual examination of boxplots and histograms. A screening for multivariate outliers indicated no influential cases, thus all data were retained for analyses. An inter-item correlation matrix was examined for values exceeding 0.70, indicative of item redundancy.[14]

2.2 Reliability

2.2.1 Internal consistency reliability—To assess the extent to which each subscale of the MENQOL measured a similar construct, internal consistency reliability with Cronbach's α was computed for each subscale at baseline.

2.2.2 Test-retest reliability—Within the education control group, test-retest reliability was evaluated for each subscale using two methods: intra-class correlation coefficients (ICCs) and Pearson product-moment (PM) correlations (*r*), similar to the approach taken by the MENQOL's developers.[1] PM correlations are reported since their interpretation tends to be more intuitive; however, ICCs were also computed with the recognition that test-retest scores are non-independent measures, a theoretical violation of *r*. Additionally, the ICC provides a way to calculate test-retest reliability with multiple retests. A two-way random effects model was utilized in computing the ICCs, as sources of error variance could be identified,[15] including time since LMP and chemotherapy treatment. Because of the divergent times at which the retest MENQOLs were administered between the two studies, ICCs and *r*'s were calculated for both the separate and combined study samples. Study 1's third MENQOL administration at 26 weeks was not included in test-retest calculations due to excessive elapsed time.

2.3 Validity

2.3.1 Principal components analysis (PCA)—PCA with oblique promax rotation was performed for the baseline MENQOL administration to determine if the latent item structure mirrored the four domains specified in the instrument's construction. Promax rotation was utilized due to the high number of component inter-correlations, indicating factors would likely be correlated. A Kaiser-Meyer-Olkin (KMO) statistic of 0.696 indicated factor analysis was appropriate for the data,[16] and Bartlett's Test of Sphericity was significant, suggesting absence of multicollinearity. The number of extracted components was determined by the scree plot, percentage of variance explained by each component, number of eigenvalues over one (Kaiser-Guttman rule), and consideration of prior psychometric MENQOL analyses. Items were considered representative of a component if their individual

item loading was ≥ 0.50. Cross-loading items were those items that loaded ≥ 0.30 on two or more components.17

2.3.2 Convergent and discriminant validity—Convergent and discriminant validity were assessed for the vasomotor and psychosocial domains of the MENQOL at baseline via PM correlations between the respective subscale scores and several concurrent measures representing vasomotor and psychosocial quality of life. A similar assessment for the physical or sexual subscales was precluded by the absence of comparative measures.

To establish vasomotor domain convergent validity, vasomotor items of the Kupperman Index ("hot flashes," "profuse perspiration") and daily symptom diary ("hot flashes," "night sweats") were correlated with the vasomotor subscale scores of the MENQOL in a method similar to that utilized by Lewis et al.[2] In the Kupperman Index, menopausal symptoms are given a score on a scale from zero to three, corresponding to "not present" to "severe." This score is multiplied by a constant, indicative of the relative importance attributed to the specific symptom.18 In this analysis, the averages of the combined hot flash and profuse perspiration scores were the basis for correlation.

The daily symptom diary measures severity of hot flashes and night sweats on the same zero to three scale used by Kupperman. These scores are multiplied by daily frequency of symptoms. In this analysis, participants recorded in the diary prior to randomization for seven days. An average for both symptoms was computed for this period by summing the products of severity and frequency and dividing by seven. These individual symptom means were then combined into an average that became the basis for correlation. Later, a post-hoc individual item mean correlation was performed to observe if this would improve the low combined symptom convergent correlation.

To assess psychosocial domain convergent validity, psychosocial subscale scores were correlated with the seven-day average of the "mood change" item of the daily symptom diary and select items of the Kupperman Index (weighted combined score from items "nervous irritability" and "depressive moods"). Discriminant validity was assessed for both the vasomotor and psychosocial domains via correlations of the respective subscales with the psychosocial and vasomotor items of the Kupperman Index and symptom diary.

3. Results

3.1 Sample and Item Characteristics

The two samples included within this analysis did not differ significantly in any baseline variables, except for type and stage of breast cancer. See Table 1 for sample baseline characteristics.

Univariate normality was violated for each item of the MENQOL, consistent with expectations for dichotomous items embedded within Likert-scale type formats.[19, 20] Specifically, the vasomotor items and item 14 ("difficulty sleeping") were negatively skewed, indicative of item endorsement and an accompanying high degree of interference in quality of life. All other items were positively skewed. Only one redundancy (r = 0.738) was noted from the inter-item correlation matrix: item 13 ("feeling tired or worn out") and 17 ("decrease in stamina"). Both items were retained in the analyses in order to facilitate comparisons to past psychometric work with the MENQOL.

3.2 Reliability

3.2.1 Internal consistency reliability—Cronbach's α for each subscale is displayed in Table 2. α-values for all subscales were between 0.710–0.850 without any item deletions,

except the sexual subscale, whose α-value improved to 0.710 with the removal of item 28 ("vaginal dryness"). 0.70 is considered the lower threshold for adequate internal consistency reliability for an established instrument.[21]

3.2.2. Test-retest reliability—PM and ICC test-retest reliability correlations are presented in Table 3. ICCs at the combined first follow-up ranged from 0.616 on the sexual subscale to 0.822 on the vasomotor subscale, and all were significant at the $\alpha = 0.05$ level. *R*'s were lower than ICCs overall. ICCs and *r*'s were more often significant and consistently higher for the week five to nine period, than from baseline to either of these follow-up points for all Study 2 subscales. The ICCs for the combined three follow-up periods in Study 2 were above 0.720 and significant at $\alpha < 0.01$ for each domain. Study 1 *r*'s and ICCs failed to reach significant levels for the sexual, physical, or vasomotor subscales (with the exception of *r* in the vasomotor subscale).

3.3 Validity

3.3.1 Principal components analysis—The scree plot suggested extraction of eight factors, whereas nine eigenvalues exceeded one and explained 69.6% of the variance. Item loadings in the component, pattern, and structure matrix with nine extracted components revealed the emergence of three to four strong components that explained just under 50% of the variance. Here, we report item loadings from the pattern matrix.

Items 1–3, corresponding to the vasomotor subscale, all loaded above 0.70 on a single component with no identified cross-loadings. Items 4–10, corresponding to the psychosocial subscale, all loaded above 0.54 on a single component with no cross-loadings, except items 4, ("being dissatisfied with my personal life"), 5 ("feeling anxious or nervous") and 6 ("experiencing poor memory"), each of which had one or more cross-loadings in multiple matrices. Items 11–26, corresponding to the physical subscale, had multiple primary loadings on six different components, with the majority of items either loading on a non-extracted component (i.e., a component explaining only a small amount of variance or having less than three primary loadings) or cross-loading on several different components. Notably, item 18 ("feeling a lack of energy") and item 25 ("frequent urination") did not load on any component. The only three-item blocks in the physical subscale loading above 0.50 on a single component—the conservative criterion recommended to designate a component [14, 21]—were (1) items 12 ("aching in muscles and joints"), 15 ("aches in back of neck or head"), and 24 ("low backache"); and (2) items 19 ("drying skin"), 22 ("changes in appearance, texture or tone of your skin"), 23 ("feeling bloated"), and 28 ("vaginal dryness during intercourse"). Respective Cronbach's α for the items loading in these two component blocks were 0.521 and 0.627.

Finally, items 27–29, corresponding to the sexual subscale, all loaded above 0.70 on a single component, except item 28. Although this item cross-loaded with the sexual items, it had a primary loading with one of the component blocks within the physical subscale as noted above. See Table 4 for individual item loadings according to the specified factor structure.

3.3.2 Convergent and discriminant validity—With regard to convergent validity, the "hot flash" and "profuse perspiration" items of the Kupperman Index together had a significant correlation of 0.614 with the vasomotor subscale of the MENQOL. The correlation was somewhat less, but still significant, between the MENQOL's vasomotor domain and the combined "hot flash" and "night sweat" items of the symptom diary. Correlation of individual diary items with the vasomotor subscale did not improve the strength of the relationship.

The "nervous irritability" and "depressive moods" items of the Kupperman Index together correlated highly ($r = 0.724$) and significantly with the psychosocial subscale of the MENQOL. Similar to the symptom diary's correlation with the vasomotor subscale, the "mood change" item of the diary correlated moderately, though significantly, with the MENQOL's psychosocial subscale. Evidence of discriminant validity for both the vasomotor and psychosocial subscales, respectively, was established by the uniformly low, non-significant correlations with the psychosocial and vasomotor items of the Kupperman Index and symptom diary (r's ≤ 0.176, p's > 0.05; see Table 5).

4. Discussion

In this analysis, the MENQOL exhibited adequate to good internal consistency reliability on all subscales except the sexual, moderate to high test-retest reliabilities in all domains at the combined first follow-up point, and an underlying factor structure generally mirroring the domains specified by the MENQOL, except in the physical domain. Convergent validity was established for the vasomotor and psychosocial subscales with the Kupperman Index, which was less evident for the daily symptom diary. Discriminant validity for these subscales was also supported.

Overall, the pooled age at onset of menopause in this analysis was lower than reported in previous MENQOL work,[1, 2] and the majority of participants reported a pathological cause of menopause, as expected. Study differences in staging and types of cancer may be attributable to the large number of unclassified cancers in Study 1, rather than true group differences. Because there were no other sample differences, the two groups could be combined for most analyses. The negative skewing of the vasomotor items is expected, due to the strong, direct relationship between vasomotor symptoms and the physiological basis of menopause. Additionally, "difficulty sleeping" (item 14) is very closely tied to the phenomenon of night sweats,[22, 23] which would account for the negative skew of this item.

Internal consistency reliabilities of the psychosocial and physical subscales in this analysis were approximately equal to those reported by Lewis et al.2 and Hilditch et al.,1 while the vasomotor and sexual subscales were considerably less, but similar to results reported in an analysis of an adapted version of the MENQOL.[24] Notably, that study had a sample of women with a range of ages comparable to our analysis. The discrepancy in the sexual and vasomotor subscales may also be due to their brevity, decreased response rate and non-endorsement of the sexual items (possibly a result of their stronger relationship to natural aging, particularly item 28, "vaginal dryness"), and the acceleration of and variable nature of vasomotor symptoms among breast cancer survivors. Although also problematic in the factor analysis, consideration of item 28 for removal (or grouping with another subscale) warrants further investigation in this population, as any deletion in such a small subscale may decrease internal consistency reliability.[25]

Combined study test-retest reliabilities for each subscale from baseline to first follow-up tended to be slightly less than those reported by Lewis et al.,[2] Hilditch et al.,[1] or Gelfand et al.[24] The wide variability of individual test-retest reliabilities among both domain and study is likely due to several factors, including small n's, the six week difference between the two studies at first follow-up, retest periods beyond the two to four weeks reported by the other studies, and the possibility that menopause symptoms in breast cancer survivors behave in a more state- than trait-like fashion.[5, 6] Additionally, Study 2's test-retest reliabilities tended to be lower when taking the baseline measurement into account. This suggests a sensitization effect, a point strengthened by the fact that participants did not regularly complete the daily symptom diary until week five.

In the PCA analysis, almost all items in the vasomotor, psychosocial, and sexual subscale loaded strongly and exclusively in their respective domains. Physical subscale items loaded on multiple components, and in several cases, at least three of these items could be combined to identify a new component. For example, items 12, 15, and 24, might be termed "aches," while the items in the second component block might be called "dryness" (see Table 4). Elimination of other physical subscale items based upon this analysis, however, is premature; a formal factor analysis procedure has never been undertaken for the MENQOL to our knowledge, and our sample size is on the smaller end of the continuum suggested for meaningful factor analysis results. Although our combined sample had over 100 participants and a subjects-to-items ratio of 3.7:1, meeting the acceptable standard for factor analysis according to several sources,[1, 26] Nunnally and Bernstein[21] suggest a sample size of at least 4–5:1. Additionally, a theoretical controversy exists in regard to the suitability of factor analysis for quality of life scales.[27, 28]

The moderate correlation between the vasomotor items of the Kupperman Index and the MENQOL to establish convergent validity is similar to that reported by Lewis et al.[2] As they noted, correlation was likely attenuated by comparing two items in the Kupperman to the MENQOL's three. Additionally, the Kupperman Index differs from the MENQOL in its intended administration via interview, absence of a clearly defined recall period, and scarcity of psychometric data.[18] Conversely, the Kupperman psychosocial domain correlation displays good convergent validity. This domain discrepancy may be due to the weightings applied to the multiplicative constants of the Kupperman's vasomotor items, compared to the constant of "1" assigned to both psychosocial items of the Kupperman. The latter format is more comparable to the MENQOL.

Failure of the symptom diary items to achieve high convergent validity with the MENQOL's vasomotor and psychosocial subscale items is likely due to differences in the recall periods between the instruments (one day versus one month) and *intended* measurement intervals (seven days versus one month). Moreover, sample size for the symptom diary is somewhat less than for the other comparisons of convergent validity.

5. Conclusions

This analysis examined the psychometric properties of the MENQOL in a population of breast cancer survivors. Overall, the instrument performed nearly as well in this subgroup as the target population of women experiencing natural menopause. In order to confirm these results and incorporate the MENQOL into breast cancer research, psychometric analysis with a larger sample of women, in whom menopausal symptoms may be more exclusively attributed to cancer treatment, is indicated.

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Table 1

Pooled Baseline Sample Characteristics

Characteristic		*n*	Mean	SD[a]	%	*p* (between studies)
Age (years)		108	53.2	6.0		0.60
Age at menopause		97	46.8	5.3		0.29
Time (months) since LMP[b]		108	85.5	136.5		0.14
Menopause cause	Cancer treatment	49			45.4	0.88
	Gynecological surgery	19			17.6	
	Natural	39			36.1	
	Total	**107**			**99.1**	
Type of breast cancer	DCIS[c]	21			19.4	0.01
	ILC[d]	10			9.3	
	IDC[e]	40			37.0	
	Other	24			22.2	
	Total	**95**			**88.0**	
Stage of breast cancer	0	10			9.3	0.02
	I	34			31.5	
	II	40			37.0	
	III	7			6.5	
	Total	**91**			**84.3**	
Chemotherapy	Yes	64			59.3	0.33
	No	37			34.3	

Characteristic	*n*	Mean	SD[a]	%	*p* (between studies)
Total	**101**			**93.5**	

[a] SD = standard deviation;

[b] LMP = last menstrual period;

[c] DCIS = ductal carcinoma in situ;

[d] ILC = invasive lobular carcinoma;

[e] IDC = invasive ductal carcinoma

Table 2

Internal Consistency Reliability

Subscale domain	Cronbach's α	*n*	Item number(s) deleted	Resultant α if item deleted
Vasomotor	0.711	107	2	0.726
Psychosocial	0.850	108		
Physical	0.818	108	21; 26	0.820 (#21); 0.819 (#26)
Sexual	0.673	97	28	0.710

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Table 3

Domain-Specific Test-Retest Reliability

			Baseline to 1st follow-up (Study 1 = week 11; Study 2 = week 5)		Baseline to week 9	Week 5 to week 9	Baseline to week 5 to week 9
			Combined Study 1 & 2	Individual Study 1 & 2			
Vasomotor	***r***	Study 1	0.701^{***} (25)	0.976^{**}(6)			
		Study 2		0.505^{*}(19)	0.488^{*}(18)	0.733^{***} (18)	
	ICC	Study 1	0.822^{***}	0.987			
		Study 2		0.667^{*}	0.656^{*}	0.870^{***}	0.812^{***} (18)
Psychosocial	***r***	Study 1	0.514^{**} (25)	0.928^{**}(6)			
		Study 2		0.381(19)	0.279(18)	0.863^{***} (18)	
	ICC	Study 1	0.658^{**}	0.958^{**}			
		Study 2		0.527	0.430	0.921^{***}	0.720^{**}(18)
Physical	***r***	Study 1	0.571^{**} (25)	0.431(6)			
		Study 2		0.578^{**}(19)	0.253(18)	0.703^{**}(18)	
	ICC	Study 1	0.707^{**}	0.602			
		Study 2		0.710^{**}	0.401	0.784^{**}	0.757^{***} (17)
Sexual	***r***	Study 1	0.451^{*} (24)	0.426(6)			
		Study 2		0.464(18)	0.670^{**}(18)	0.688^{**}(17)	
	ICC	Study 1	0.616^{*}	0.568			
		Study 2		0.632^{*}	0.800^{**}	0.815^{**}	0.850^{***} (17)

$^{*}p < 0.05$;

$^{**}p < 0.01$;

$^{***}p < 0.001$

r = Pearson product-moment correlation; ICC = intra-class correlation coefficient. Parenthesized numbers indicate *n* for a particular follow-up period for both *r* and ICC.

Table 4

Factor Structure Based on Pattern Matrix from PCA Analysis with Promax Rotation

		Extracted Component				
		Component 1: "Psychosocial"	**Component 2: "Aches-Physical"**	**Component 3: "Vasomotor"**	**Component 4: "Dryness-Physical"**	***Non-component: "Sexual"*****
MENQOL Subscale	MENQOL Item Number					
Vasomotor	1			0.839		
	2			0.742		
	3			0.846		
Psychosocial	4*	1.007				
	5*	0.876				
	6*	0.678				
	7	0.535				
	8	0.819				
	9	0.615				
	10	0.717				
Physical	12		0.707			
	15		0.742			
	19				0.956	
	22*				0.548	
	23*				0.547	
	24		0.693			
Sexual	27					0.833
	28*				0.638	
	29					0.784
% of Variance Explained by Component		23.5	9.5	7.0	6.3	5.7
Cumulative % of Variance Explained by Components		23.5	33.0	40.0	46.3	52.0

* Items with one or more cross-loadings (i.e., loadings of ≥ 0.30 on components other than the primary/highest loading item)

** The "sexual" component is not a true component, as less than three items load on it. It is depicted here primarily to compare our findings with the MENQOL's subscales as originally conceived.

Note Values represent primary component loadings for each item. Each component is named in quotations for the items of which it is composed. From the physical subscale, items 11, 13, 14, 16, 17, 20, 21, & 26 are not shown here due to loadings on non-extracted components (i.e., components which did not explain a significant amount of variance or did not have ≥ 3 item loadings); Items 18 and 25 are not represented due to absence of loadings on any component.

Table 5

Convergent & Discriminant Validity in the Vasomotor and Psychosocial Subscales

MENQOL	Kupperman Index				Symptom Diary		
	HF[a]	PP[b]	NI[c]	DM[d]	HF[a]	NS[e]	MC[f]
Vasomotor subscale	0.614*** (107)		0.176 (107)		0.432*** (105)	0.410*** (100)	0.097 (89)
					0.478*** (100)		
Psychosocial subscale	0.082 (108)		0.724*** (108)		−0.032 (105)	0.061 (100)	0.481*** (89)
					−0.018 (100)		

*** $p < 0.001$

Tabled values represent *r*; parenthesized numbers indicate *n* of correlation. Convergent validity represented on left diagonal and discriminant validity represented on right diagonal.

[a] HF = hot flash item;

[b] PP = profuse perspiration item;

[c] NI = nervous irritability item;

[d] DM = depressive mood item;

[e] NS = night sweat item;

[f] MC = mood change item