DEVELOPMENT OF THE POST-MENOPAUSAL STRESS SCALE (PMSS) TO ASSESS THE LEVEL OF STRESS AMONG POSTMENOPAUSAL WOMEN

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ABSTRACT
Menopause is the permanent cessation of menstruation due to loss of ovarian follicular activity (WHO, 1981). Postmenopause refers to a woman’s time of life after menopause has occurred, which can manifest in both physical and emotional ways. Stress affects not only the physical health of a woman but also their relationships, work performance, a general sense of well-being, and quality of life. In the past decade, there has been an increase in the number of research studies on Stress among menopausal and postmenopausal women. An instrument was developed to assess the level of stress among postmenopausal women. This article describes the development of a Likert scale, the Post-Menopausal Stress Scale PMSS, which is a 20-item self-reported instrument that qualifies three main stress-inducing factors of menopausal symptoms that is, Stress towards Physical factors, towards Psychological factors and Sexual factors. The steps involved in its development are the review of literature, development of items, content validation, translation, and language validity, pretesting, and reliability. After establishing the content validity, the PMSS was pretested with five subjects. To establish the reliability of the PMSS, 20 postmenopausal women were recruited through purposive sampling technique. To measure the stability between scores obtained, test-retest reliability was computed using the Karl Pearson correlation coefficient and the r-value was 0.92. The internal consistency was measured using the Spearman-Brown Prophecy Formula and item-total correlation and the r-value was 0.789. The item discrimination analysis was also computed and the value was 0.62. These statistical measurements indicate that the PMSS was reliable. The PMSS is a valid and reliable tool that can be utilized for assessing the level of stress among postmenopausal women.

Keywords: Postmenopause, Stress, Postmenopausal women.

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INTRODUCTION:
“The most creative act you will ever undertake is the act of creating yourself”.
- Samsher A

Menopause is the physiologic cessation of menstruation associated with declining ovarian function. It is usually complete after one year of amenorrhea. Natural menopause occurs at the time nature intended. Artificial menopause tends to be medically related. This is usually surgical – the ovaries are removed typically during a hysterectomy. It is a normal biological shift in the mid to late 30s when estrogen and progesterone levels decline gradually. Oestrogen is the main female hormone responsible for all reproductive functions.

Menopause is due to estrogen deficiency. 18 October is World Menopause Day and as the world’s population ages, there will be increasing numbers of women entering menopause and living beyond post-menopause. The potential symptoms of menopause may harm the quality of daily life. In addition to these symptoms, women may experience a different level of stress and wellbeing during menopausal and postmenopausal phases of life. Some women also experience a sense of loss during the postmenopausal period. A woman’s attitude towards this change in her life may influence her appraisal of the occurrence and may impact her level of distress associated with the experience.

Stress can be defined as the response of the body to internal and external threat factors and the consequences of this response. Stress exerts physiological effects on peripheral organs, starting from the central nervous system, via hormonal secretion. The purpose of this process is to properly adapt to the changes in the surrounding environment. Although transient stress may accelerate adaptation, chronic stress may cause a variety of mental and physical problems. Therefore, stress has recently drawn attention as a cause and exacerbating factor of various diseases.

A cross-sectional study by Mayo Clinic, 2018 showed that 1,744 women aged 40-65 years showed that higher mindfulness correlated with lower menopause symptom scores, as well as lower stress scores in this population. A correlation was seen between higher menopause symptom scores and higher perceived stress. Thus, more studies are required, for the possible role of concern in improving psychological symptoms, emotional response to menopausal symptoms, and stress in post-menopausal women, says Dr. Richa Sood, lead author of the study from the Mayo Clinic. It is essential to identify the level of Stress among postmenopausal women with valid and reliable tools. The PMSS is one such tool developed by the authors.

Purpose of the study
This study aims to develop a Stress scale for determining the level of stress among postmenopausal women. The development of this stress scale is a part of a larger study, which aims at identifying the effectiveness of a Coping Interventional Educational Package, which has one of the variables as stress among postmenopausal women.

MATERIALS AND METHODS
There were several steps involved in the development of this scale. The steps followed were the review of literature, development of the items, content validation, translation to Tamil language and language validity, pretesting, and reliability. These steps are represented in Figure 1.

Figure 1: The steps followed in the development of PMSS.
Review of literature
According to Polit and Beck, it might be possible to adapt an existing instrument rather than starting from scratch. Hence, the authors reviewed the literature to identify the instruments that were already available for determining the level of stress among postmenopausal women. PubMed, CINAHL, books, reports, articles, periodicals, published, and unpublished research studies were reviewed for this purpose. The opinion towards Menopause – Specific Quality of Life Questionnaire (MENQOL), Perceived Stress Scale (PSS), and Menopause Rating Scale (MRS) were identified.

Development of items
The investigators produced a pool of items based on the literature that was reviewed, the clinical observation, and their professional experience. The 23 statements that were developed were stratified into three main domains: Physical factors (12 items), Psychological factors (7 items), and Sexual factors (4 items). A five-point Likert scale was used to evaluate the level of Stress among postmenopausal women ranging from not at all (Score – 0), Sometimes (Score – 1), rarely (Score – 2), frequently (Score – 3), and more frequently (Score – 4).

Content Validation
Content validity concerns the degree to which an instrument has an appropriate sample of items for the construct being measured and adequately covers the construct domain (Polit DF & Beck CT, 2011). The content validity of this draft tool was established by submitting it to seven experts who reviewed its content. Five experts were from the field of Obstetrics and Gynecology and two were from Obstetrics and Gynecological Nursing. Of the 23 items in the PMSS, 18 items had 100% agreement among the experts, two items had only 20% agreement and three items had no agreement among experts. Two items were modified and three items were deleted, which resulted in a total of 20 items. These 20-items PMSS was subjected to content validity for the second time, by submitting it to five experts. There was a 100% agreement among the experts, on all the items. Thus, no modification was made in the 20-item PMSS. (Annexure 1)

In addition to the percentage of agreement, the content-validity ratio (CVR) was calculated for each item based on the formula from Lawshe (1975).

\[
CRV = \frac{n_e - N/2}{N/2}
\]

CVR = a direct linear transformation from the panel list saying “essential”
ne = the number of the panel list indicating “essential”
N/2 = total number of the panel list divided by two.

CVR values range from +1 to -1. Values closer to 1 indicate experts’ agreement that the item is essential to content validity. Lawshe concluded that a CVR of at least 0.99 would be necessary with seven experts or fewer subject matter experts.

The CVR was calculated to quantify the extent of experts’ agreement. The five-point agreement questionnaire for the accuracy of the items that ranged from “strongly agree” to “disagree” was given to the subject experts. The items that had responses as “strongly agree” and “agree” were considered as “essential” and those that had responses as “strongly disagree” and “disagree” were considered as “not necessary”. Those items which the experts had responded to as “uncertain” were considered as “useful but not essential”. The CVR for PMSS was +1 indicating that the items are essential to content validity.

Translation and language validity
After establishing the content validity of the PMSS, it was translated into Tamil, the regional language, by an expert. The translated version was retranslated to the English language by another expert, for establishing language validity. There was no ambiguity in any of the items or instructions, and so no modification was made. The tool was then pretested.

Pretesting
It is the trial administration of a newly developed instrument to identify flaws or assess the time requirement (Polit DF & Beck CT, 2011). Pretesting the PMSS is an essential step before establishing reliability. The purpose of the pretesting is to enhance the clarity of the tool and to check question-wording. After obtaining formal
administrative permission, the Tamil version of the tool was administered to five postmenopausal women in a selected rural area. This was done to determine the clarity of the items and the average time required for completing the tool. The PMSS was found to be clear and understandable to the postmenopausal women. The average time taken to complete the tool was 25–30 min. The reliability of the PMSS was established after the pretesting.

Reliability
Reliability refers to the degree of consistency or dependability with which an instrument measures the attribute (Polit DF & Beck CT, 2011). The stability of quantitative measure is the extent to which the same scores are obtained when the instrument is used by the same people on a separate occasion. Assessment of stability is derived through test-retest procedures; it is a statistical technique used to estimate components of measurement error by repeating the measurement process on the same subjects, under conditions as similar as possible, and comparing the observations (Oermann MH & Gaberson KB, 2009). The item-total correlation test is performed to check if any item in the set of tests is inconsistent with the averaged behavior of the others, and thus can be discarded. The analysis is performed to purify the measure by eliminating garbage items before determining the factors that represent the construct (Gliem AJ & Gliem RR, 2003).

The reliability of the PMSS was established using test-retest and internal consistency.

Sampling
The population for the reliability comprised of postmenopausal women. After administrative permission from a selected rural area in Valparai, 10 postmenopausal women were selected through a Simple random sampling technique to collect data, for computing reliability. The criteria for selection of the samples were the postmenopausal women who were between the age group of 45 – 65 years, who give the consent to participate in the study and who were not taking any hormonal replacement therapy.

Data collection
The study received approval from the Ethical Committee of Himalayan University as this is part of the doctoral study undertaken by the first author. Formal permission for data collection was taken from the Village Administrative Officer from the selected rural area, where the pilot study was conducted. The purpose of the data collection was explained to the postmenopausal women, their consent was taken and the PMSS was administered.

Statistical analysis
The internal consistency of the instrument was measured using Cronbach's alpha and item-total correlation. To measure the stability between scores obtained, test-retest reliability was computed using the Karl Pearson correlation coefficient. The instrument was administered to the postmenopausal women and was repeated to the same subjects, after a gap of 7 days. All statistical analysis was performed using Statistical Package for Social Sciences (SPSS) version 16.0.

RESULTS
Internal consistency
Item analysis applied; there were 20 items with coefficients 0.30, which indicates that there was a low correlation with other items in the instrument. The final instrument consisted of 20 items. The Cronbach's alpha computed was 0.92. It is estimated that the Cronbach's alpha if the item deleted (Last column) was above 0.82 for all the items. When the values are greater than alpha is 0.7. This means that no need to drop any items. Even though for five items the findings showed in negative in item-total correlation the items were not taken out since the alpha value showed above 0.75 if the item deleted.

Test-retest reliability
Test-retest reliability using Pearson's correlation coefficient was computed using the formula.

\[ r = \frac{n(\Sigma xy) - (\Sigma x)(\Sigma y)}{\sqrt{[n\Sigma x^2 - (\Sigma x)^2][n\Sigma y^2 - (\Sigma y)^2]}} \]

The r-value of the PMSS was 0.92 and it indicates that the PMSS was reliable.
DISCUSSION
A tool to determine the level of Stress among postmenopausal women in the Indian setting has not been identified so far. Generally speaking, the higher the alpha is, the more reliable the test is. There isn’t a commonly agreed cutoff. Usually 0.7 and above are acceptable. The Cronbach’s alpha value of the PMSS was found to be acceptable (0.789). The Cronbach’s alpha coefficient is a measurement of the internal consistency of the items in the instrument. If the overall Cronbach's alpha coefficient is over 0.80, it is considered quite sufficient, if it is over 0.70 it is sufficient. Alpha coefficient indicated that internal consistency was adequate. The test-retest reliability showed the tool was stable.

Limitation of the study
The most significant limitation of the study is that factor analysis was not carried out. No measure of construct validity was performed.

CONCLUSION
It is concluded from the study findings that the PMSS had reliability and validity within an acceptable range. The factor analysis may be done after which the instrument can be used for further studies.

ACKNOWLEDGMENT
My sincere thanks to the experts who validated the tool as well as all the postmenopausal women who participated in the collection of data for establishing reliability. The authors also extend gratitude to Dr. Ibrahim A. Abdelazim, Consultant, Department of OBG, KOC hospital, Kuwait, and Professor, Department of OBG, Ain Shams University, Egypt, Certified Publons Academy Reviewer and International Researcher, and to Mrs. Bhuvaneswari N, Biostatistician, for the statistical inputs.

REFERENCES
### POSTMENOPAUSAL STRESS SCALE (PMSS)

<table>
<thead>
<tr>
<th>S. NO</th>
<th>STRESS FACTORS</th>
<th>NOT AT ALL</th>
<th>SOMETIMES</th>
<th>RARELY</th>
<th>FREQUENTLY</th>
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<td>3</td>
<td>Night sweats</td>
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<td>Difficulty in sleeping</td>
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<td>Feeling tired</td>
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<td>8</td>
<td>A decrease in physical strength</td>
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<td>Decreased sexual desire</td>
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</table>

**Scoring interpretation:**

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<th>Level of Stress</th>
<th>Allotted scores</th>
<th>Percentage</th>
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<td>0 %</td>
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<tr>
<td>Mild</td>
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<td>1 – 25%</td>
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<tr>
<td>Moderate</td>
<td>21 – 40</td>
<td>26.25 – 50%</td>
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<tr>
<td>Severe</td>
<td>41 – 60</td>
<td>51.25 – 75%</td>
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<tr>
<td>Very Severe</td>
<td>61 – 80</td>
<td>76.25 – 100%</td>
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