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ADAPTATION OF THE MENSTRUAL PERIOD-RELATED SYMPTOM QUESTIONNAIRE INTO TURKISH: VALIDITY AND RELIABILITY STUDY
MENSTRÜEL DÖNEMLE İLİŞKİLİ SEMPTOM ANKETİ'NİN TÜRKÇE'YE UYARLANMASI: GEÇERLİK VE GÜVENİRLİK ÇALIŞMASI

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ABSTRACT

This methodological research was conducted to adapt the Menstrual Period-Related Symptom Questionnaire to the Turkish by performing its validity and reliability. The study sample consisted of 260 women aged 18-49, who had regular menstruation in the past six months, were literate in Turkish, and resided in Türkiye. The mean age of the women was 22.85±7.63 and the mean menarche age was 13.21±1.36. Data were collected online between 30 October 2023 and 09 January 2024, using the snowball sampling method. Data Collection Form and Menstrual Period-Related Symptom Questionnaire were used to collect research data. The scale was first translated from English into Turkish, and then back-translated into English by a language expert. After ensuring semantic consistency between the original and the back-translated version, the final Turkish version of scale was developed. The validity and reliability of the scale were evaluated using item analysis, content and construct validity, confirmatory and explanatory factor analyses and internal consistency coefficient. Content validity was examined using the Davis technique and calculated as 0.89. The suitability of the data for factor analysis was confirmed by the results of both the Kaiser-Meyer-Olkin (KMO) test (0.921) and Bartlett's Test of Sphericity (x^2(325)=4646.027; p<0.001). The item-total score correlations of the scale ranged between 0.353 and 0.863. The Cronbach α reliability coefficient was 0.943. In conclusion, the Turkish version of the Menstrual Period-Related Symptom Questionnaire was found to be a valid and reliable tool for assessing menstrual symptoms of women.

Keywords: Menstrual cycle, menstruation, reliability and validity, women's health.

ÖZ

Bu metodolojik araştırma, Menstrual Dönemle İlişkili Semptom Anketi'nin Türkçe'ye uyarlanması ve geçerlilik ile güvenirliğinin değerlendirilmesi amacıyla yapılmıştır. Araştırmanın örneklemini, 18-49 yaşları arasında, son altı ayda düzenli adet gören, Türkçe okuryazar olan ve Türkiye'de yaşayan 260 kadın oluşturdu. Kadınların yaş ortalaması 22.85±7.63, ve menarş yaşı ortalaması 13.21±1.36'dır. Veriler, 30 Ekim 2023- 09 Ocak 2024 tarihleri arasında kartopu örnekleme yöntemi kullanılarak çevrimiçi olarak toplandı. Araştırma verilerinin toplanmasında Veri Toplama Formu ve Menstrual Dönemle İlişkili Semptom Anketi kullanıldı. Ölçek, önce İngilizceden Türkçeye çevrilmiş, ardından bir dil uzmanı tarafından tekrar İngilizceye çevrilmiştir. Orijinal ve geri çeviri versiyonları arasında anlamsal tutarlılık sağlandıktan sonra ölçeğin nihai Türkçe versiyonu geliştirildi. Ölçeğin geçerliliği ve güvenilirliği, madde analizi, içerik ve yapı geçerliliği, doğrulayıcı ve açıklayıcı faktör analizleri ve iç tutarlılık katsayısı kullanılarak değerlendirildi. İçerik geçerliliği Davis tekniği kullanılarak incelendi ve 0.89 olarak hesaplandı. Verilerin faktör analizi için uygunluğu, hem Kaiser-Meyer-Olkin (KMO) testi (0.921) hem de Bartlett Küresellik Testi (x^2 (325) = 4646.027; p<0.001) ile doğrulandı. Ölçeğin madde toplam puan korelasyonları 0.353 ile 0.863 arasında değişmektedir. Cronbach α güvenilirlik katsayısı 0.943'tür. Sonuç olarak Menstrual Dönemle İlişkili Semptom Anketi'nin Türkçe versiyonu kadınların menstrual semptomlarını değerlendirmek için geçerli ve güvenilir bir araç olarak bulundu.

Anahtar kelimeler: Menstrüel siklus, menstrüasyon, güvenilirlilik ve geçerlilik, kadın sağlığı.

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INTRODUCTION

Menstruation is a physiologically normal process that occurs from menarche to menopause in the form of menstrual bleeding and indicates fertility. Women menstruate for about half of their lives and also experience physical, behavioral, and emotional symptoms related to the changes brought on by this process.[1,2] Symptoms that occur due to menstruation are generally classified as premenstrual syndrome (PMS) and dysmenorrhe.[3] The American College of Obstetrics and Gynecology defines PMS as physical and psychological symptoms that begin five days before menstruation and end four days after the onset of menstruation in three menstrual cycles. Menstrual cramps are one of the most common health problems that occur during the reproductive phase of a woman's life. It affects approximately one in two women.[4] It is known that 47.8% of women worldwide and 52.2% in Türkiye suffer from PMS.[4,5]

Menstrual symptoms vary from woman to woman, depending on personal characteristics, pre-existing medical conditions, environmental factors and psychological variables, and may even vary between cycles.[4,6] PMS leads to an increase in psychological distress as well as physical symptoms. It has also been associated with negative effects on an individual's overall quality of life, as well as their daily activities. It can also lead to disruptions in social life, school and work.[7,8] Satıoğlu and Kabakçı, reported that 82.5% of female university students experienced some degree of discomfort, including abdominal, back and waist problems, during menstruation. Additionally, the participants (77%) reported experiencing psychological disorders, including tension, sensitivity and aggressiveness.[9] On the other hand, another study found that half of the women suffered from pain during each menstrual period and often showed symptoms of irritability, back pain and weakness.[1] The menstrual symptoms experienced by women affect them functionally and emotionally, reducing their self-efficacy and diminishing their quality of life.[1,10] Healthcare professionals have a responsibility to improve health by determining the symptoms experienced by women during menstruation and implementing the necessary care and treatment plan for the problems identified.[8] It is important to properly assess women with PMS in a society, raise awareness about this issue, sensitise the women and collaborate with them for curative studies to contribute to the health of women and the community.[7]

There is a need for studies that use standardised measurement tools to objectively assess possible symptoms that women may experience during menstruation.[4] The scales in the literature are diverse. While existing scales focus on PMS and dysmenorrhea some aim to assess the impact and experience of menstruation.[2,3,11-13] However, there is a need for scales that assess menstrual symptoms holistically, have a high degree of individual comprehensibility, can be used internationally, and are easy to understand and use. In this way, healthcare professionals can provide a measure to evaluate women's menstrual experiences and it may be easier for them to monitor the effectiveness of the care and treatment provided.[14]

The objective of this study was to perform a Turkish validity and reliability assesment of the Menstrual-Related Symptoms Questionnaire, as developed by Ferretti et al., and to contribute to the Turkish literature.[14]

MATERIALS AND METHODS

This study was methodologically planned to adapt the Menstrual-Related Symptoms Questionnaire to the Turkish language and to determine its validity and reliability.

The study population consisted of all women aged 18-49 years living in Türkiye between 30.10.2023-09.01. 2024. The study sample was collected online using the snowball method. Snowball sampling method was chosen in this study to efficiently reach individuals who meet the specific criteria of the research. Women aged 18-49 years, who had regular menstruation in the last 6 months and could read and write Turkish were included in the study. The minimum number of observations generally required for a factor analysis is at least 5 observations for each variable.[15] The scale used in this study has 26 items. Accordingly, the minimum number of people to be reached was calculated as 130. In this study, participants were informed that participation in the study was entirely voluntary and that the data collected would only be used for scientific purposes. If they gave their consent, the data collection phase was initiated and 260 participants were reached.

Data Collection Tools

The data collection form and Menstrual-Related Symptom Questionnaire prepared by the researchers after reviewing the relevant literature were used to collect the research data.[2,7,11,14]

Data Collection Form: The form comprises five questions designed to elicit demographic information and gynaecological characteristics (including age of menarche and menstrual characteristics) from the women participating in the study. [2,7,11]

Menstrual-Related Symptoms Questionnaire: The scale developed by Ferretti et al., comprises 26 questions on common physical and psychological symptoms that women may experience due to their menstrual cycle. The Menstrual-Related Symptoms Questionnaire (MRSQ) contains questions about the presence and severity of certain symptoms; the menstrual symptom questionnaire includes items related to experiences that do not describe symptoms (i.e., respondents reporting if they know when their period willlikely begin). This scale also includes a distinction between crampy and congestive dysmenorrhea types. The MRSQ also does not include the distinction between spasmodic and the distinction between spasmodic and congestive types of dysmenorrhea, as it is erroneous to characterize all syptoms into these categories. In the MRSQ, the severity of each symptom is expected to be reported on a four-point Likert scale (1 = no symptom to 4 = severe). Scores on the scale can range from 26 to 104. As the score increases, so does the severity of the symptom. There are no sub-dimensions in this scale. The Cronbach α value was found to be = 0.90 in the original scale.[14]

Translation of the Scale Into Turkish and Intercultural Adaptation

The researchers initially translated the English version of the scale into Turkish. Subsequently, the translated scale was translated back into English by an English

language teacher using the back-translation method. The researchers investigated whether there were any differences in meaning between the original version of the scale and the back-translated scale. It was found that there were no changes that would have disrupted the meaning or structure during translation and that linguistic equivalence was achieved for the Turkish form of the scale.

Statistical Analysis

The data were analysed using the Istanbul University Licence Program; Statistical Package for Social Sciences for Windows 29.0 [SPSS] and IBM SPSS Amos 25.0 programmes. The quantitative data obtained from the research data were analyzed using descriptive analysis methods such as mean, standard deviation and frequency. In order to test the reliability and validity of the scale, a series of analyses were conducted, including "Reliability Analysis", "Item-Total Score Correlation", "Confirmatory Factor Analysis (CFA)" and "Exploratory Factor Analysis (EFA)". The statistical significance value was assumed to be p≤0.05. Acceptable model fit was evaluated using the cutoff values: CFI (Comparative Fit Index)≥ 0.90, AGFI (Adjusted Goodness of Fit Index)≥ 0.85, GFI (Goodness of Fit Index) ≥ 0.85, RMSEA (Root mean square error of approximation) ≤ 0.08.[16-18] The reliability and validity analyzes were conducted in accordance with the COSMIN (Consensus-based Standards for the selection of health status Measurement Instruments) guidelines.

RESULTS

Socio-Demographic Characteristics

The mean age of the women (n=260) was determined as 22.85±7.63 (min: 18 – max: 44; 25th percentiles: 17.71-75th percentiles: 27.9, Median: 22) and the mean age of menstruation as 13.21±1.36 (min: 9 – max: 17). 42.35% of the women (n=110) stated that their menstrual cycle was "regular" and 57.65% (n=150) stated that their menstrual cycle was "irregular".

Language and Content Validity

In this study, expert opinions were gathered from academics specializing in women's health and disease nursing (n = 4) and experienced women's health nurses (n = 4). In order to assess content validity, the Davis technique (DT) was employed. The content validity index (CVI) of the 26-item scale was determined to be 0.89 on the basis of expert feedback. Specifically, the CVI for items 8, 17, 22, and 24 was 0.86, while the CVI for all other items was 1. These four items (8, 17, 22, 24) were revised according to the experts' recommendations. The suggestions for the points mentioned relate to making the expressions more comprehensible. For example, point 8 "swelling of the extremities" should be changed to "swelling of the extremities (hands, feet, etc.)" to make it easier to understand. According to the literature, a CVI greater than 0.80 is considered acceptable.[19,20] The final version of the scale was tested on a group of participants not included in the main study sample (n=23). During this pilot testing, researchers conducted face-to-face interviews to gather feedback on the clarity and comprehensibility of the items. The results of the pilot study indicated that all items were clear and easily understood by participants.

Construct Validity

Exploratory Factor Analysis

The suitability of the data for factor analysis was confirmed by the results of both the Kaiser-Meyer-Olkin (KMO) test (0.921) and Bartlett's Test of Sphericity (x^2 (325) =4646.027; p<0.001). In this study to ascertain the factor structure of the scale used, principal component analysis (PCA) was selected as the extraction method.[21,22] The analysis revealed a factor structure that accounted for 66.31% of the total variance. The Scree Plot chart was analysed and it was determined that the scale had one factor, as a sudden and sharp drop was seen in the first component (Figure 1).

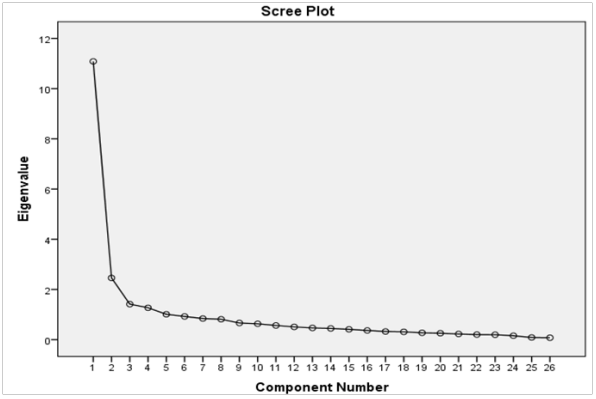

Figure 1. Scree plot

The factor loading provides information about the direction and strength of the relationship between the item and the factor. A factor loading of more than 0.30 generally indicates a moderate correlation between the item and the factor.[23] In this study, the factor loadings of all the items were found to be between 0.479 and 0.863. It was found that the items showed a moderately high correlation with the factors.[24] The results pertaining to the factor loadings of the items are presented in Table 1.

Internal Consistency

The Cronbach α value of the questionnaire on menstruation-related symptoms was calculated to be 0.943. The correlation values between the items-total score correlation of the Menstrual Period-Related Symptom Questionnaire ranged from 0.353 to 0.809 (Table 1).

Confirmatory Factor Analysis

The results of the fit index for the model created for the one-factorial structure of the scale are shown in Table 2. The analysis results indicated that all fit index values fell within acceptable ranges. The path diagram (Figure 2) reveals that the factor loadings of the scale items range M1: 0.56, M2: 0.44, M3: 0.40, M4: 0.47, M5: 0.42, M6: 0.42, M7: 0.47, M8: 0.26, M9: 0.55, M10: 0.41, M11: 0.71, M12: 0.62, M13: 0.71, M14: 0.37, M15: 0.55, M16: 0.45, M17: 0.47, M18: 0.41, M19: 0.88, M20: 0.82, M21: 0.90, M22: 0.91, M23: 0.74 M24: 0.83, M25: 0.86, M26: 0.73. The item 8 demonstrates a very low factor loading, indicating a weak correlation with the latent factor and suggesting that it may not effectively measure the intended construct. However, the overall scale maintains its unidimensional structure and demonstrates a satisfactory model fit, as confirmed through the fit indices. Given these results, the evaluation proceeded without removing Item 8 to preserve the integrity and consistency of the scale for further analysis.

Table 1. Results of the exploratory factor analysis of the scale

Items		Factor loading	Item-Total Score Correlation
Item 1	Abdominal bloating	0.521	0.593
Item 2	Breast tenderness	0.557	0.474
Item 3	Dizziness	0.550	0.495
Item 4	Headache	0.479	0.529
Item 5	Hot flashes	0.636	0.487
Item 6	Palpitations	0.664	0.512
Item 7	Nausea	0.533	0.562
Item 8	Swelling of the extremities (hands, feet, etc.)	0.499	0.353
Item 9	Acne	0.645	0.523
Item 10	Diarrhea/Constipation	0.566	0.459
Item 11	Fatigue	0.619	0.717
Item 12	Abdominal cramping	0.614	0.661
Item 13	Lower back pain	0.609	0.694
Item 14	Food cravings	0.794	0.364
Item 15	Increased/decreased appetite	0.781	0.573
Item 16	Insomnia	0.533	0.546
Item 17	Confusion	0.776	0.558
Item 18	Forgetfulness	0.690	0.506
Item 19	Anxiety/nervousness	0.822	0.778
Item 20	Irritability	0.863	0.809
Item 21	Emotional hypersensitivity	0.845	0.788
Item 22	Mood swings	0.846	0.804
Item 23	Depression	0.659	0.707
Item 24	Tendency to cry easily	0.747	0.739
Item 25	Angry outbursts	0.791	0.776
Item 26	Increased desire to be alone	0.601	0.679
	Cronbach α value	***0.943***	
	Explained Variance (%)	***66.31***	

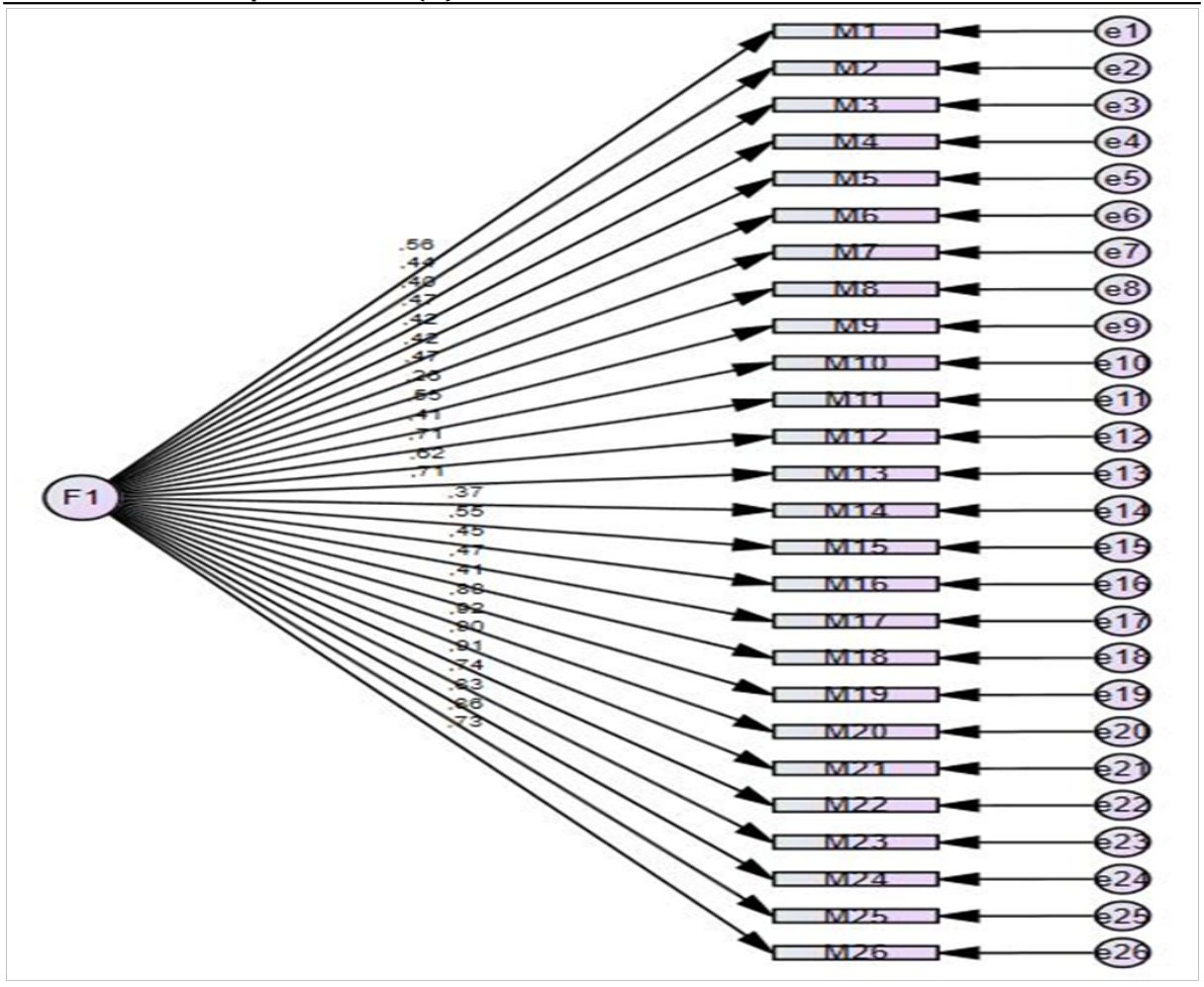

Figure 2. Path diagram

Table 2. Fit indices in confirmatory factor analysis

	χ2 (sd)	p	CMIN**/df	RMSEA***	CFI****	AGFI*****	GFI******
MRSQ*	4.92	<0.001	5.00	0.0778	0.925	0.854	0.920

*MRSQ: Menstrual Period-Related Symptom Questionnaire; **CMIN/df: Chi-square value to degrees of freedom /; ***RMSEA: Root mean square error of approximation; ****CFI: Comperative Fit Index; *****AGFI: Adjusted Goodness of Fit Index****** GFI: Goodness of Fit Index

Test-retest Reliability

The COSMIN guideline states that 50-99 participants are sufficient for the application of the repeat test. Therefore, the menstrual-related symptom questionnaire was administered a second time two weeks later[25] to 55 participants from the group of women to whom the scale was applied for the purpose of re-testing via the online platform. The test-retest reliability was assessed using the Intraclass Correlation Coefficient (ICC) with a two-way mixed-effects model and absolute agreement definition (ICC (3,1)). The analysis showed excellent reliability between the test and retest scores (ICC = 0.901; 95% CI = [0.85–0.94]; $p < 0.001$). Consequently, the scale was found to be stable over time.[16]

DISCUSSION

Researchers expect a quality measurement instrument to be valid and reliable. Validity determines whether a measurement is carried out correctly according to the rules and whether it truly reflects the characteristic that is to be measured. Reliability, on the other hand, refers to the consistency between the responses that individuals give to the items of the measurement instrument.[16]

When adapting a scale to Turkish culture, it is recommended to prove the scope validity and linguistic-cultural equivalence of the scale items with numerical data and to interpret the expert opinions using grading techniques in order to evaluate them correctly.[16] In this study, the DT was used for scope validity. In the translation and back-translation of the menstrual symptoms questionnaire, the meaning of the original items was retained. No special adjustment was required for cultural adaptation. The CVI value determined in the scale is expected to be higher than 0.80.[17] The CVI value was determined to be 0.89 in the study. Accordingly, the language and scope validity of the scale is sufficient. For scale adaptations, it is recommended to conduct a pilot study with 10-15 people who have similar characteristics to the sample group while maintaining the same method of data collection.[16,17]The final Turkish form, which was prepared in accordance with the expert opinions, was applied to a pilot group of 23 individuals. Validity refers to the ability of a test or scale to measure the item in question accurately and without error. In this context, a scale is considered valid if it measures the intended values completely and accurately.[17,18] Exploratory and confirmatory factor analyses were conducted for scale construct validity. The results of the exploratory factor analysis indicated that the data were adequate and appropriate for analysis (KMO = 0.921; Bartlett's test of sphericity: $\chi^2(325) = 4646.027$, $p < 0.001$). The factor loadings of the items ranged from 0.479 to 0.863, with the scale explaining 66.31% of the total variance. The results of the confirmatory factor analysis indicated that the standardised factor loadings of the scale items ranged from 0.45 to 0.73, and the goodness-of-fit indices demonstrated an acceptable fit (χ^2/df = 4.92, RMSEA = 0.078, CFI = 0.925, GFI = 0.920, AGFI = 0.854).

Every valid scale is also expected to be reliable. Reliability is defined as the absence of imbalance and consistency between the responses given to the scale items by the actual participants.[23,26] In this study, the responses scored for each item followed a normal distribution and all items showed good item-total correlation. One of the most commonly used methods for measuring the reliability of scales is the Cronbach's α coefficient. If the Cronbach α-coefficient is in the confidence interval of $0.00<\alpha<0.40$, the scale is considered unreliable; if it is in the confidence interval of $0.41<\alpha<0.60$, the scale has low reliability; if it is in the confidence interval of $0.61<\alpha<0.80$, the scale has medium reliability; and finally, if it is in the confidence interval of $0.81<\alpha<1.00$, the scale has high reliability.[26] The study determined a Cronbach's α value of 0.943, indicating high internal consistency. The results of the analyses demonstrated that the Menstrual Period-Related Symptom Questionnaire is a reliable and valid tool for using in Türkiye.

This study has several limitations. Since the information obtained from this study is based on the subjective evaluations of the participants, there is a possibility of self-report bias. In addition, only women aged 18-49 years with regular menstruation for the last 6 months were evaluated in this study, so the results cannot be generalised to other female sample groups in the society.

CONCLUSION

The Menstrual Period-Related Symptom Questionnaire can be used in studies on various causes of menstrual symptoms. Each step of this study was conducted according to the COSMIN guidelines. The Menstrual Period -Related Symptom Questionnaire is a measurement tool that assesses menstrual symptoms with quick, simple and understandable items. Further studies should confirm other groups such as adolescents, women diagnosed with polycystic ovary syndrome and endometriosis. In this study, online platforms were the preferred method for data collection. However, despite the convenience offered by this method, there are fundamental limitations such as the generalization of the data to the entire population and the accessibility to people who do not have internet access.

Ethics Committee Approval: Ethics committee approval was received for this study from the Niğde Ömer Halisdemir University Ethics Committee (Date: 24/10/2023, Number: 14-08).

Informed Consent: Written consent was obtained online from all women participating in the study.

Peer-review: Externally peer-reviewed.

Author Contributions: Conception- RA, ÇB, MK; Design - RA, ÇB, MK; Supervision- RA, ÇB, MK; Materials- RA, ÇB, MK; Data Collection and/or Processing- RA, MK;

Analysis and/or Interpretation- ÇB, MK; Literature: RA, ÇB; Review- RA, ÇB, MK; Writing- RA, ÇB, MK; Critical Review: RA, ÇB, MK.

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Hakem Değerlendirmesi: Dış bağımsız

Yazar Katkıları: Fikir- RA, ÇB, MK; Tasarım- RA, ÇB, MK; Denetleme- RA, ÇB, MK; Kaynaklar- RA, ÇB, MK; Malzemeler-BK, AK; Veri Toplanması ve/veya işlenmesi - RA, MK; Analiz ve/veya yorum-ÇB, MK; Literatür taraması-RA, ÇB; Yazıyı yazan- RA, ÇB, MK; Eleştirel inceleme- RA, ÇB, MK.

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