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Original Article (Pages: 14699-14709)

# The Development and Evaluation of a Culturewise Instrument for Menstrual Hygiene

Mohammadali Rezaei[1], *Neda Mohammadinia[2], Kazem Najafi[3], Mohammad Ali Morowatisharifabad[4]

[1] PhD of Health in Disaster and Emergencies, Assistant Professor, School of Nursing and Midwifery, Bam University of Medical Sciences, Bam, Iran.

[2] PhD of health education & health promotion, Assistant Professor, Department of Community Health Nursing, School of Nursing and Midwifery, Bam University of Medical Sciences, Bam, Iran.

[3] Kazem Najafi; PhD student of nursing, Nursing Department, School of Nursing & Midwifery, Bam University of Medical Sciences, Bam, Iran.

[4] PhD of Health Education, Professor, Department of health education and promotion, School of Public Health, social determinants of health research center, Shahid Sadoughi University of Medical Sciences, Yazd, Iran.

***Abstract***

***Background:*** Menstrual hygiene is a complex phenomenon which is affected by various factors especially cultural factors, and poor menstrual hygiene can be a major cause for infertility and other problems. This study aimed at developing and psychometrically evaluating a cultural instrument for comprehensive measurement of menstrual hygiene.

***Methods:*** This study was performed in two phases based on the PEN3 cultural model. The first phase was a qualitative study and literature review for the initial development of the instrument. The second phase was to determine the validity and reliability of the instrument. In order to determine the validity, we used the expert panel, impact score, Content Validity Ratio (CVR), and Content Validity Index (CVI); to determine the reliability, we used the test-retest method and Cronbach's alpha coefficient.

***Results:*** The instrument (questionnaire) has two parts; the first part consisted of 10 demographic questions and the second part was constructed based on PEN3 cultural model structures. After measuring the validity, Score Impact results suggested that all Items had a score of 1.5 or above. In the content validity index, we omitted 2 Items with CVI lower than 0.79 and 11 Items with CVR lower than 0.49. As for the reliability of the questionnaire (Cronbach's alpha), the items with the reliability coefficient higher than 0.7 were confirmed. So the reliability of the Acknowledge section was 0.87, Attitude 0.92, Practice 0.90, and the score for Enablers was 0.87.

***Conclusion:*** This study presents a reliable and valid cultural instrument for comprehensive measurement of menstrual hygiene. Thus, it can be used to assess needs or investigate the effects of executive and educational interventions.

***Key Words:*** Cultural instrument, Instrument development, Menstrual hygiene, Psychometrics.

*Please cite this article as: Rezaei M, Mohammadinia N, Najafi K, Morowatisharifabad M. The Development and Evaluation of a Culturewise Instrument for Assessing Menstrual Hygiene. Int J Pediatr 2021; 9 (11):14699-14709. DOI: **10.22038/IJP.2020.51383.4084**

**** Corresponding Author:***

Neda Mohammadinia, PhD of health education & health promotion, Assistant Professor, Department of Community Health Nursing, School of Nursing and Midwifery, Bam University of Medical Sciences, Bam, Iran. Email: nedamohammadinia@yahoo.com

Received date: Aug.217,2020; Accepted date:Sep.7,2020

## 1- INTRODUCTION

A vital period in human evolution is adolescence (1) and the turning point of this era is puberty (2). Menarche is the last (3) and the most significant sign of puberty (4). The age of menarche varies from 9 to 18 (5) and its average age is 13.8 years in Iran (6). Considering the processes related to menstruation, the stressful symptoms and sometimes their interference with daily life of individuals, it is very important to pay attention to menstruation (7), especially because a woman spends, on average, about 67 months of her life in menstruation from menarche to menopause (8 and 9).

Menstruation can step beyond a physiological process and society may consider it positive or negative (10). For instance, in the opinion of Turkmen people, the menstrual period is a sign of physical health and fertility, and they believe that the dirty blood thereby exits the body (11). In India, menstruation is associated with superstition and this period excludes women from many social practices (12). Based on the estimations made by UNICEF, one in ten African girls leaves school during menstruation (13). A large body of studies stated that the main reasons for not attending school during menstruation include dysmenorrhea (14,15), the lack of a private space for changing and disposing of the sanitary napkins, washing the multi-use napkins, long class hours (16-19), and shortage of water and health facilities (13), and embarrassment and fear of issues such as blood leakage (19). In many developing countries, plants are also considered a popular treatment (13) and may even be followed by health risks, although they may not undergo some of the pharmacological experiments (20).

Thus the phenomenon of menstrual hygiene as a valuable chain has four parts: awareness and attitude, access to sources of information and health products. It requires using a private, safe and clean space for disposing of sanitary napkins and water and sewage systems suitable for washing in the living environment, and girls' education place (21).

This complex phenomenon is affected by various physiological, cultural, social, economic factors etc., which despite the quantitative researches, all of these factors have not yet been identified, i.e. in different societies they encounter it differently which can be due to cultural beliefs, lack of awareness, inadequate attitudes or lack of sufficient facilities that would result in inappropriate consequences of the management. Therefore, the most important step in preventing and resolving these consequences and problems is providing access to appropriate cultural instruments for assessing needs, followed by implementation of educational interventions.

Culture is an important factor that shapes human behavior, and should be considered in all health education and promotion programs (22). Thus, the present study used the PEN-3 model in which culture is considered as the centerpiece of preventive and health promoting behaviors (23).

The PEN-3 model consists of three-dimensions (PEN); every PEN consists of three parts (**Fig. 1**).

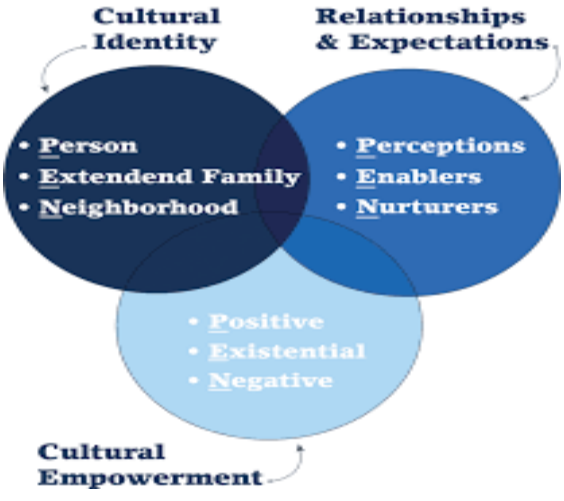


**Fig. 1:** PEN-3 cultural model (23)

PEN1 is health education and cultural identity, which may be directed to the person, extended family (relatives), or neighborhoods (communities and leaders) (24.25). PEN2 is the relationships and expectations which include perceptions (knowledge, beliefs, and values), enabler factors (resources, facilities, equipment, skills, etc.) and reinforcing factors or nurturers (individuals who person follow them) (23,26); and PEN3 or cultural empowerment that classify beliefs, enablers and nurturers based on impact on health behavior: positive group (in the direction of health behavior), existence group (without affecting health behavior) or negative group (inhibiting health behavior) (24,27).

Despite the importance of attending to menstrual hygiene and the numerous studies on menstrual hygiene in Iran, no standard and culturally sensitive instrument is found for comprehensively measuring all dimensions of menstrual hygiene. Therefore, the researcher aimed to develop an instrument and evaluate it psychometrically in order to take a step to improve menstrual hygiene and prevent further complications in the samples of Iranian population.

## 2- MATERIAL & METHODS

### 2-1.First stage

Initially, a qualitative study was conducted with Directed Content Analysis approach. Then, based on its results and the review of the related literature, the researchers developed an instrument for culturally measuring menstrual hygiene.

### 2-2. participants

The participants were 32 individuals (13 students, 10 their mothers, and 9 their teachers) from 5 secondary schools in Bam city. Bam city is in Kerman province, south-east of Iran. Inclusion criteria were filling the consent form, active participation in interviews and having experienced at least one-year menstruation cycles. Participants were selected based on an objective-oriented approach and continued until data saturation (no new code being extracted).

### 2-3. Data collection

Data were collected in four centralized group discussions consisting of 3-5 people and in-depth interviews with students, their mothers and their teachers on menstrual hygiene. Content analysis of interview data after being analyzed by Granhime and Landman method, led to 5 main themes based on PEN-3model structures (Acknowledge, Attitude, Practice, In-school available Enablers, In-house available Enablers). Then, according to the themes obtained from the interviews, review of studies and available resources in this field, a set of 97 items about menstrual hygiene were prepared.

### 2-4. Development of the instrument

This instrument was a questionnaire with two parts. The first part consisted of 10 demographic Questions including the parents' age, education, job, educational level, monthly income, birth rate and hearing about the menstruation and its source, and the second part, included 97 items of the menstrual hygiene based on PEN-3 model structures (Acknowledge, attitude, student practice during menstruation and available facilities in the school and the home).

Items scoring in the Acknowledge subscale was as follows: the correct option: 2, I don't know: 1, and the incorrect: 0. In the attitude subscale, we used the 5-point Likert scale for accountability as Strongly agree: 4, agree 3, N/A: 2, disagree: 1, and totally disagree: 0. In the Practice subscale, the items of always, sometimes and never were given scores of 2, 1, and 0, respectively. The last subscale of the questionnaire dealt with the available facilities, with three options, and

the answers of Yes, Somewhat and No, were scored 2, 1 and 0, respectively.

**2-5. second stage**

In the next step, validity and reliability of the questionnaire were quantitatively and qualitatively evaluated. In order to quantitatively determine the face validity, we determined the impact score and the opinions of 10 students were investigated in the target group, based on which the items less than 1.5 were omitted from the questionnaires (24) (Score Impact = Frequency% × Importance).

In order to qualitatively determine the face validity of the scale, five experts, having PhD in Reproductive Health and Nursing, were asked to qualitatively investigate the questionnaire and present their corrective opinions in writing regarding the simplicity, clarity and relevance of the Items. In order to qualitatively assess the content validity, they were also asked to provide their corrective comments in writing in terms of grammar, use of proper words, the importance of Items, the placement of Items in their section, and the completion and responding time of the instrument, and finally all corrective comments were applied.

In the quantitative assessment of content validity and to ensure that the correct questions were selected, we calculated the Content Validity Ratio (CVR) and Content Validity Index (CVI) of the questionnaire. The author used the expert panel method to investigate the content validity ratio (CVR) and the questionnaire was sent to 15 experts in the fields of reproductive health, health education, nursing and gynecology and obstetrics. They were asked to answer the options in front of each question (1- necessary, 2-useful, but unnecessary, 3-unnecessary). In order to calculate the Content Validity Ratio (CVR), the responses were calculated based on the following formula and adapted to the Lawsheh Tables (24).

$$CVR = \frac{n_E - \frac{N}{2}}{\frac{N}{2}}$$

In this equation, $n_E$ is the number of experts who responded to the necessary option and N is the total number of experts. If the calculated value was higher than the value of the table, the validity of the content of that item was accepted. Based on the Lawsheh Tables, because the number of experts was 15, Items with a CVR above 0.49 were accepted. Calculation of Content Validity Index (CVI) was done based on the Waltz and Basel Content Validity Index (30). To this aim, 15 experts were again provided with the questionnaire and asked to complete the following criteria considering the 4-point Likert scale considering each question for relevance, simplicity and clarity; for instance, 1. Irrelevant, 2. Need for a serious revision, 3. Relevant, but needs revision; 4. Completely relevant. Eventually, the total number of agreeing scores for each item (scores 3 and 4) were calculated on the total number of respondents to each item, and Items with a score higher than 0.79 were accepted.

In order to assess the test-retest reliability of the questionnaire, which is an index of the repeatability of a scale, the opinions of a number of subjects in the target groups (25 secondary school girl students) were assessed and reassessed with a three-week interval.

**2-6. Ethical Considerations**

First, the study was approved by the ethics committee of Shahid Sadoughi University of Medical Sciences (ethical approval code: IR.SSU.SPH.REC.96.148). Second, before the interview, the researcher introduced herself, described the research objectives for the participants and obtained their informed consent. In this way, the researcher took precise conversation notes and wrote all non-verbal movements. The participants were assured about the

confidentiality of their information and their voice record. The participants were free to leave the study at any stage.

## 3- RESULTS

The Score Impact results suggested that all Items had a score of 1.5 or above, thus they were included in the questionnaire. The CVI results also indicated that 2 Items had a score lower than 0.79, and in the case of CVR score, 11 Items scored less than 0.49, i.e., they did not obtain an acceptable score; and all of the above items were omitted from the questionnaire, which indicated the use of necessary items in this instrument (**Table 1**).

**Table-1:** Content Validity of the Questionnaire by Content Validity Ratio (CVR) and Content Validity Index (CVI) after item revisions

| Items | CVI | CVR |
|---|---|---|
| **Acknowledge Measurement Items** | | |
| 1. Menstruation is the monthly loss of the uterine wall. | 0.93 | 0.6 |
| 2. In menstruation, washing should be done after urination. | 1 | 1 |
| 3. In menstruation, drying should be done after each washing. | 1 | 1 |
| 4. Drying and washing after urination, should be from back to forth. | 1 | 1 |
| 5. On foot and short-term showering is beneficial in menstruation. | 1 | 1 |
| 6. Underwear should be washed separately each day. | 0.93 | 0.86 |
| 7. Underwear should be ironed or dried under the sun. | 0.93 | 0.86 |
| 8. During menstruation, a light-colored cotton cloth should be worn. | 0.86 | 0.73 |
| 9. The time for changing the sanitary napkins in menstruation depends on the amount of bleeding. | 0.93 | 0.86 |
| 10. The minimum time for changing the sanitary napkin in menstruation should be 4 to 6 hours. | 0.93 | 0.86 |
| 11. The dirty sanitary napkin should be wrapped in paper and thrown out. | 1 | 0.73 |
| 12. People who do not have a problem with menstruation are permitted to have physical activity. | 1 | 1 |
| 13. Exercise and the type of diet will affect the amount of blood lost during a menstrual period. | 0.6 | 1 |
| 14. Resting is recommended during the menstrual cycle. | 1 | 1 |
| 15. To prevent menstrual complications, one week before menstruation, a special diet should be followed. | 1 | 1 |
| 16. Dairy consumption is beneficial in reducing menstrual pain. | 1 | 1 |
| 17. Consuming seeds (e.g. low-salt nuts) is useful in reducing menstrual pain. | 0.86 | 0.6 |
| 18. Local heating (hypogastric, abdomen and waist) helps reduce menstrual pain. | 1 | 1 |
| 19. Eating foods with a warm temperament helps reduce menstrual pain. | 1 | 1 |
| 20. Consuming some drinks made from herbs such as thyme, chamomile, basil, etc. helps reduce menstrual pain. | 0.93 | 0.86 |
| 21. Consuming some foods during menstruation (warm temperament, flatulent, sour, sweet foods, some fruits and vegetables) can cause menstrual pains. | 1 | 1 |
| 22. Consuming some foods during menstruation (warm temperament, flatulent, sour, sweet foods, some fruits and vegetables) can increase menstrual bleeding. | 0.93 | 0.86 |
| 23. Consuming some foods during menstruation (warm temperament, flatulent, sour, sweet foods, some fruits and vegetables) can cause future fertility problems. | 0.93 | 0.86 |

| Items | CVI | CVR |
|---|---|---|
| 24. Consuming some foods during menstruation (cabbage, onions, and lettuce and roast foods) makes menstrual discharge smelly. | 0.93 | 0.73 |
| 25- Menstrual bleeding is facilitated by eating foods with a warm temperament and shortens menstrual periods. | 1 | 1 |
| 26. More fluid intake is recommended during menstruation. | 0.86 | 0.6 |
| **Attitude Measurement Items** | | |
| 1. Menstruation is a natural event. | 0.93 | 0.6 |
| 2. Menstruation makes you feel healthy. | 0.86 | 0.6 |
| 3. Menstruation brings a feeling of maturity and evolution in the individual. | 1 | 0.6 |
| 4. Menstruation removes filth and dirty blood from the body. | 0.73 | 0. 56 |
| 5. Talking about menstruation is embarrassing. | 0.93 | 0.6 |
| 6. Menstruation means a monthly repetition of some physical - psychological problems. | 0.8 | 0.68 |
| 7. Menstruation is worrisome due to the possibility of making clothes dirty. | 0.86 | 0.86 |
| 8. Menstruation does not affect the daily and educational performance of the person. | 0.93 | 0.6 |
| 9. Performing some exercise (heavy exercise, heavy running, jumping up and down and playing with jump rope) in menstruation causes the uterus to fall. | 1 | 1 |
| 10. Observing menstrual hygiene is essential. | 1 | 0.73 |
| 11. Observing menstrual hygiene prevents infections and infertility. | 0.93 | 0.68 |
| 12. In menstruation, compliance with dietary restrictions is essential. | 0.93 | 0.7 |
| 13. Food temperament affects menstrual pain. | 0.93 | 0.7 |
| 14. Food temperament affects the amount of menstrual bleeding. | 0.93 | 0.7 |
| 15. Food temperament will affect future fertility problems. | 1 | 1 |
| 16. Food temperament affects children's gender in the future. | 1 | 1 |
| 17. Some non- medication methods help reduce menstrual pain. | 0.93 | 0.68 |
| 18. Only medication methods help reduce menstrual pain. | 0.93 | 0.68 |
| 19. Food temperature affects menstrual pain. | 0.93 | 0.7 |
| 20. The food temperature affects menstrual bleeding. | 0.93 | 0.7 |
| Practice Measurement Items | | |
| **During menstruation** | | |
| 1. Do you take a bath? | 1 | 1 |
| 2. Do you stand while taking a bath? | 1 | 0.86 |
| 3. After urination do you wash yourself? | 1 | 0.86 |
| 4. After washing when you go to the toilet every day, do you dry yourself? | 1 | 0.86 |
| 5. Do you observe back to front drying and washing? | 1 | 1 |
| 6. Do you change your underwear every day? | 1 | 1 |
| 7. Do you wash your underwear separately? | 1 | 0.86 |
| 8. Do you always iron or dry your underwear in the sun? | 1 | 0.86 |
| 9. Do you change your sanitary napkin every 3-4 hours or after urination? | 0.93 | 0.86 |
| 10. Do you wrap your sanitary napkin in paper after changing it? | 0.93 | 0.86 |
| 11. In menstruation do you follow a special diet (restriction of cold, flatulent, sour, sweet food, etc.)? | 0.93 | 0.86 |
| 12. Do you restrict your dairy consumption? | 1 | 1 |
| 13. Do you eat nuts (low-salt nuts)? | 0.93 | 0.86 |
| 14. Do you consume fruit and vegetables? | 0.93 | 0.86 |
| 15. Do you take iron or folic acid tablets? | 1 | 1 |
| 16. Do you restrict your daily activity? | 1 | 1 |

| Items | CVI | CVR |
|---|---|---|
| 17. Do you refrain from exercising? | 1 | 1 |
| 18. If you have pain during menstruation, do you just use sedatives? | 0.93 | 0.86 |
| 19. If you have pain during menstruation, do you use non-medication methods such as herbal drinks, hot showers, etc.? | 0.86 | 0.86 |
| **In-school Available Enablers** | | |
| 1. Sanitary napkin | 0.93 | 0.86 |
| 2. Trash cans with lid | 0.93 | 0.86 |
| 3. Clean toilets | 0.93 | 0.86 |
| 4. Private places in toilets for removing the sanitary napkin | 0.8 | 0.6 |
| 5. Consultant on menstrual problems | 0.93 | 0.86 |
| 6. Trusting teacher for treating menstrual problems | 0.93 | 0.73 |
| 7. A training session on the menstruation, with a midwife, a doctor or an informed individual | 1 | 0.86 |
| 8. Visiting a doctor, when necessary | 1 | 0.86 |
| 9. Proximity of school to health or treatment center | 0.8 | 0.6 |
| 10. Contacting the family in case of menstruation | 1 | 0.86 |
| 11. Absence permit in case of menstrual problems | 0.93 | 0.6 |
| 12. Appropriate communication between school and family | 0.93 | 0.6 |
| 13. Educational books or CDs about menstruation issues in school | 0.93 | 0.86 |
| **In-house Available Enablers** | | |
| 1. Sufficient sanitary napkins | 1 | 0.86 |
| 2. Appropriate number of underwears | 1 | 0.86 |
| 3. Detergents to regularly wash the underwear | 1 | 0.86 |
| 4. Private and comfortable environment for removing sanitary napkins | 1 | 0.86 |
| 5. Trash cans with lid | 1 | 0.86 |
| 6. Money required for following up and treating menstrual problems | 0.93 | 0.80 |

The results of calculating Cronbach's alpha coefficient for measuring the reliability of the questionnaire indicated that the reliability of Acknowledge was 0.87, Attitude 0.92, Practice 0.90, and Facilities was 0.87 (Items with the reliability higher than 0.7 were confirmed).

Finally, the questionnaire including 26 Acknowledge, 20 Attitudes, 19 Practice and 19 available enablers Items that the Items 4,10,13,14,15,19,21,22,23,24,25 of Acknowledge section and Items 4, 5, 6, 7, 9, 12, 13, 14, 15, 16, 18, and 20 of attitude section which were negative, were inversely scored.

## 4- DISCUSSION

The present study was among the first studies which dealt with development of a reliable and valid cultural instrument for a comprehensive measurement of menstrual hygiene based on its definition (awareness, attitude and cultural beliefs, access to sources of information and health products, a private, safe and clean space for disposing of sanitary napkins along with water and sewage systems suitable for washing in the living environment and the girls' educational places (21).

A large body of studies have been conducted on menstrual hygiene in girls of different age groups in Iran and other countries. However, none have comprehensively addressed the menstrual hygiene, including awareness and attitude, access to information sources and health

products, the use of a private, safe and clean space for the disposal of hygiene products and the water and sanitation system suitable for washing in the living, work and education environments of girls (8,11,16,18,21). Also, the CVI and CVR methods were not used to measure the validity and reliability of data measurement instruments. Morowatisharifabad et al. qualitatively investigated the enabling factors or existing facilities for menstrual hygiene and cultural perceptions in adolescent girls in Bam, Iran. They used in-depth interviews and focused group discussion for data collection (8, 16). The study of Siabani et al. regarding the awareness, Attitude and Practice of menstrual hygiene in adolescent girls in Kermanshah and the similar study of Kashefi et al. in Bojnourd were among studies conducted in Iran which used both methods of expert panel and Cronbach's alpha coefficient for confirming the validity and reliability of the instrument (31, 32). Mobin et al. also used a scale for collecting data on awareness, attitude and practice of high school girls in Yazd (33). Abbasi et al. conducted a similar study on girls in Ilam (34. However, in the questionnaires used in both of these studies, all aspects such as resources and facilities required for menstrual hygiene were not examined; and the CVI and CVR were not used for investigating the instrument psychometrics.

Similar studies were conducted to investigate the awareness, attitude and practice of girls in different ages in studies abroad, including the study conducted by Yadav et al. on female high school students in the Doti region, Nepal, where the questionnaire items were extracted based on the literature review and the writers' experience (35) or the study conducted by Balqis et al. in Jatinangor, Indonesia on school girls (36) and Fehintola in the Ogbomoso region, Nigeria (37) followed almost the same procedures. The study of Kamath et al. in the Municipal region of India (38) used an instrument to measure awareness, attitude and practice of the sample regarding menstrual hygiene; however, they mentioned no specific method to assess the validity and reliability of the questionnaire.

**4-1. Study limitation:** Results of this study can only be generalized to the community from which the subjects are selected.

## 5- CONCLUSION

This study presents a reliable and valid culturewise instrument for measuring all dimensions of menstrual hygiene. Thus, it can be used for needs assessment or pre-evaluation before doing any educational, preventive, executive program in menstrual health promotion or post-course evaluation.

## 6- ACKNOWLEDGMENTS

The present paper was a part of a doctoral dissertation on health education and health promotion that was funded by Shahid Sadoughi University of Medical Sciences. We thank students, their mothers, secondary school personnel and colleagues who helped us in collecting the data for this study.

**7- CONFLICT OF INTEREST:** None.

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