

Development and Validation of a Menstruation-Related Activity Restriction Questionnaire among Adolescent Girls in Urban Resettlement Colonies of Delhi

Suneela Garg, Yamini Marimuthu, Nidhi Bhatnagar, M. Megha Chandra Singh, Amod Borle, Saurav Basu, Falak Azmi, Yomri Dabi, Indu Bala

Department of Community Medicine, Maulana Azad Medical College, New Delhi, India

Abstract

Introduction: Menstruation, a physiological phenomenon, till date is associated with myths, taboos, and malpractices. These interfere with the emotional, physical, and mental health of adolescent girls. This study attempts to draft a validated questionnaire to measure menstruation-related activity restriction. **Objective:** The objective was to study activities restricted during menstruation among adolescent girls residing in urban resettlement colonies of Delhi and to develop and validate a questionnaire for menstruation-related activity restriction. **Materials and Methods:** A community-based cross-sectional study was conducted among adolescent girls residing in urban resettlement colonies of Delhi during 2019. A multistage random sampling technique was used to select 1100 girls across four districts of Delhi. A 15-item questionnaire was developed by an expert committee and validated with principal component analysis (PCA). **Results:** In total, 1100 adolescent girls were included in the study whose mean age was 15.8 (± 2.1) years. School/college/work was missed due to menstruation in 60% of the adolescent girls, 66% were not comfortable during menstruation, and 92% were restricted from entering religious places. In exploratory factor analysis using PCA, 6 principal components were identified which had eigenvalues more than 1. **Conclusion:** Religious restrictions during menstruation (94%) were highly prevalent among adolescent girls, followed by restriction of routine activity (69%) and work/academically related activity (60%). Construct validity has identified a six-factor structure for the menstruation-related activity restriction questionnaire. This was identified as a valid and internally consistent tool to assess activities restricted during menstruation among Indian adolescent girls.

Keywords: Activity restriction, factor analysis, menstrual hygiene, menstruation, questionnaire validation

INTRODUCTION

Menstruation is a normal physiological phenomenon in women beginning from adolescence until menopause. However, effective menstrual hygiene management (MHM) is a concern in millions of girls and women globally, especially in developing countries.^[1] It is well-established that lack of valid information, poor accessibility, affordability of safe adsorbent material and water sanitation, and hygiene-related issues worsens MHM outcomes, which particularly increased the incidence of reproductive tract infections.^[2] Girls and young women practicing poor MHM can withdraw from school and work, hindering their academic outcomes and occupational productivity.^[3] Furthermore, several culturally ingrained myths and taboos promote the notion of menstruation as a time of physical and ritualistic impurity in women.^[4]

Ethnographers have documented several physical, social, and religious restrictions associated with MHM among girls in India that preclude them from participating actively in routine household activities and foster social isolation.^[4] The totality of these regressive worldviews contributes to normalization of menstruation-related restrictions.^[5] Moreover, menstruation-related shame and embarrassment adversely impact MHM in young women who prefer to reuse clothes as adsorbent material without completely drying in the sun

Address for correspondence: Dr. Saurav Basu,
Department of Community Medicine, Maulana Azad Medical College, New
Delhi - 110 002, India.
E-mail: saurav.basu1983@gmail.com

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Garg S, Marimuthu Y, Bhatnagar N, Singh MM, Borle A, Basu S, *et al.* Development and validation of a menstruation-related activity restriction questionnaire among adolescent girls in urban resettlement colonies of Delhi. *Indian J Community Med* 2021;46:57-61.

Received: 25-03-20, **Accepted:** 22-09-20, **Published:** 01-03-21

Access this article online

Quick Response Code:



Website:
www.ijcm.org.in

DOI:
10.4103/ijcm.IJCM_183_20

and avoid personal hygiene measures such as bathing and washing their hair.^[6] Health and hygiene of the women is sacrificed due to these restrictions which leads to reproductive health issues like reproductive tract infections, pelvic inflammatory diseases.^[7,8] Moderate levels of physical activity during menstruation decrease the menstrual pain.^[9] This benefit is lost because of the restriction of physical activity during menstruation. Restrictions also affect the academic performances of young girls and compromise the occupation in varying degrees in working women leading to productivity loss.^[10]

It is important for public health researchers to evaluate activity restriction during menstruation in adolescent girls for their appropriate management through health promotion interventions. However, there exists a paucity of studies from India that have developed validated questionnaires for evaluation of activity restriction across physical, social, religious, hygiene, and cultural domains. The present study was, therefore, conducted to assess the restriction of activities during menstruation among adolescent girls residing in urban resettlement colonies of Delhi, India, and to develop and validate a questionnaire for the assessment of menstruation-related activity restriction (MRAR).

MATERIALS AND METHODS

Study design and setting

A community-based cross-sectional study was conducted in randomly selected urban resettlement colonies of Delhi. An urban resettlement colony represents a relocated urban slum population, which is densely populated and often lacks adequacy in sanitation and health facilities, with a significant proportion of the residents belonging to lower-middle socioeconomic classes.

Study period and population

This study was conducted for 11 months from March 2019 to February 2020 among adolescent girls (11–19 years) residing in the selected resettlement colonies in urban areas of Delhi. Both school-going and dropout adolescent girls were included. Any adolescent who was seriously ill or not willing to participate in the study was excluded.

Sample size calculation and sampling technique

With expected prevalence of satisfactory frequency of change of sanitary pads from a study as 12.7%, 20% relative precision, and 5% alpha error, the sample size was calculated to be 681 using OpenEpi, version 3 (Andrew G. Dean and Kevin M. Sullivan, Atlanta, GA, USA).^[11] Considering the effect of clustering, a design effect of 1.5 was used to inflate the sample size to 1022 with a design effect of 1.5. The sample size was then rounded to 1100 to further increase power.

Multistage sampling technique was used for selection of the study areas and participants. Out of 11 districts in Delhi, four districts were randomly selected which were East, North East, South, and North West districts. Probability proportional to size sampling

was used to select the urban resettlement colonies. The urban resettlement colonies selected were Gokalpuri in North East, Sarai Kale Khan in South, Mangolpuri in North West, and Kalyanpuri in East district. A total of 234 adolescents from Gokalpuri, 288 from Sarai Kale Khan, 398 from Mangolpuri, and 180 from Kalyanpuri were selected. A systematic random sampling method was used to select the adolescents from each colony.

Development of questionnaire

A committee consisting of experts from community medicine, public health specialist, and teachers was set up to identify various dimensions for developing the questionnaire for measurement of restriction of activities during menstruation in adolescent girls. The questionnaire was interviewer administered and consisted of mostly close-ended and a few open-ended questions.

Fifteen items were constructed considering all the dimensions related to activity restriction in simple and short sentences to promote comprehension. The items were reviewed by another expert committee for content validation, and necessary changes were made as per the expert recommendations.^[12] After revision, the questionnaires were translated to the local language Hindi in a linguistically valid manner through a back and forth translation process. Back translation was done by another language expert efficient in both English and Hindi. Then, both English versions of the questionnaires were compared for the change in meaning due to translation. Revision was done to address the discrepancies identified in the back translation. After development and content validation, pretesting was done among twenty adolescents from the study area and assessed for relevance and understanding of the items following which the questionnaire was used for data collection in the study participants.

Study procedure

After obtaining informed and written consent from eligible adolescents, data were collected using a pretested semi-structured interview schedule. Details such as sociodemographic details, menstrual hygiene practices, and activities restricted during menstruation were collected. Age of the adolescents was categorized as early (10–14 years) and late adolescents (15–19 years) based on the United Nations Children's Fund classification.^[13] Socioeconomic status of the study participants was classified based on the Modified BG Prasad Scale 2019 based on the per capita income of the family.^[14]

Operational definitions

Household activity included preparing food, cleaning home, washing clothes, taking care of siblings, lifting heavy weights, and fetching water.

Outdoor activities included playing outdoor games, going to market, fetching water from outside, and going for shopping.

Social functions included social gatherings such as family functions, marriages, birthday parties, and get together with friends.

Missed school/work included not going to school or workplace at least for 1 day in the past 1 year because of reasons attributed to menstruation-related issues as reported by the participant.

Religious practices included going to temple, handling religious books/things, doing puja, and entering puja room in the house.

Statistical analysis

Data were entered in MS Excel and analyzed using STATA statistical software version 14 (StataCorp LLC, Lakeway Drive College Station, Texas, USA).^[15] Continuous variables were summarized as mean with standard deviation (SD) or median with interquartile range (IQR) based on the distribution of data. Categorical variables were summarized as frequencies and proportions. Kaiser-Meyer-Olkin (KMO) index was used to measure the sampling adequacy. Bartlett's test of sphericity was used to test the correlation between the items of the questionnaire, and the suitability of the data for structure detection was checked. A correlation matrix was generated to check the suitability of data for factor analysis, and eigenvalues were calculated. A scree plot was used to confirm the choice of components. Exploratory factor analysis using principal component analysis (PCA) with varimax orthogonal rotation and Kaiser normalization was done for the menstruation-related activity restriction questionnaire (MRARQ).

Ethical considerations

The study was conducted after getting an ethical clearance certificate from the Institutional Ethical Committee of Maulana Azad Medical College. Data were collected after getting informed written consent from the study participants. After collecting the details, the adolescents were given health education regarding the healthy MHM and government schemes related to the menstrual hygiene.

RESULTS

A total of 1100 adolescent girls were enrolled whose mean (\pm SD) age was 15.8 (\pm 2.1) years, with 332 (70%) participants in the late adolescent stage and 768 (30%) in the early adolescent stage. The median (IQR) age was 13 (13–14) early adolescents and 17 (16–18) among late adolescents. Most participants were Hindu by religion (84%), unmarried (98%), and belonging to nuclear family (86%), whereas only 3% were involved in any part-time or full-time job.

The median (IQR) per capita income of the study participants was 2000 (1250–3000). According to the Modified BG Prasad 2019 Scale, 207 (19%) belonged to class 5, 373 (34%) belonged to class 4, 232 (21%) belonged to class 3, 152 (14%) belonged to class 2, and 36 (3%) belonged to class 1.

The activities restricted during menstruation are depicted in Table 1. Among the participants, 69% missed routine activity, 32% missed household activities, 22% had restriction of outdoor activities, and 28% were restrained from attending social gatherings. School/college/work was reported missed due to menstruation in 60% of the adolescent girls and 66% reported discomfort during menstruation. Avoidance of religious activities like handling of religious books during

menstruation was reported by 92% of the participants. Personal hygiene practices were also restricted during menstruation, including bathing (12%) and washing of hair (45%).

Kaiser-Meyer-Olkin index and Bartlett tests

The estimated KMO value for the 15-item MRARQ questionnaire was 0.659. It indicates that the sampling was adequate to do

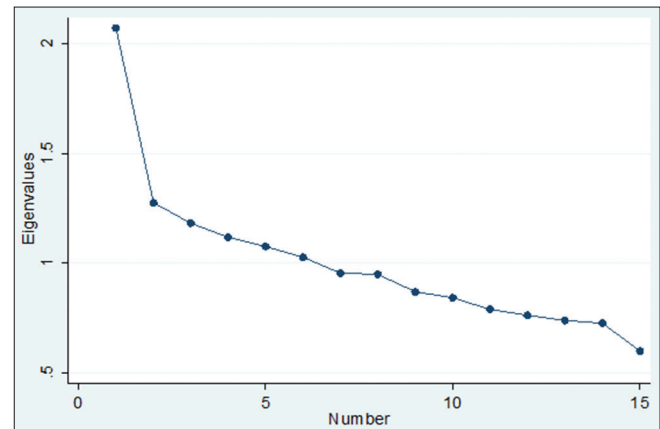


Figure 1: Scree plot depicting eigenvalues of ARM questionnaire

Table 1: Menstruation-related activity restriction among adolescent girls (n=1100)

Characteristics	Categories	Frequency (%)
Missed routine activity	Yes	758 (69)
Missed household activity [#]	Yes	349 (32)
-	NA*	112 (10)
Restriction of outdoor activities	Yes	242 (22)
-	NA*	35 (3)
Restriction from attending social functions/gatherings	Yes	304 (28)
-	NA*	13 (1)
Missed school/college/work due to menstruation	Yes	659 (60)
Less confident/comfortable during menses	Yes	724 (66)
Enter religious places during menstruation	Yes	85 (8)
Enter kitchen/cook food during menstruation	Yes	917 (83)
Take bath during menstruation	Yes	968 (88)
Wash hair during menstruation	Yes	603 (55)
Sleep on the same beds during menstruation	Yes	865 (79)
Touch pickle during menstruation	Yes	225 (20)
Touch religious books during menstruation	Yes	68 (6)
Restriction for a girl in eating certain food during menstruation	Yes	538 (49)
Restriction from sexual intercourse	Yes	22 (2)
-	NA*	1077 (98)

*NA includes girls who do not do the activities irrespective of the menstruation. NA: Not applicable [#] Household activity included preparing food, cleaning home, washing clothes, taking care of siblings, lifting heavy weights and fetching water

Table 2: Factor loadings from exploratory factor analysis (principal component analysis with varimax rotation with Kaiser normalization)

Items in MRAR questionnaire	Factor loadings					
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
Q2. Religious books	0.752					
Q1. Enter religious places	0.736					
Q3. Touch pickle	0.685					
Q13. Enter kitchen/cook		0.793				
Q7. Sleeping in the same bed		0.761				
Q12. Social functions		0.430				
Q11. Taking bath			0.649			
Q8. Wash hair			0.640			
Q4. Household work			-0.617			
Q9. Outdoor work				0.810		
Q10. Miss school/work				0.603		
Q5. Miss routine activity					0.768	
Q6. Less comfort					0.423	
Q15. Sexual intercourse						0.743
Q14. Eating certain food						-0.666

MRARQ: Menstruation - Related, Activity Restriction Questionnaire

the factor analysis. The Bartlett's test P value was <0.001 , indicating that there was a significant correlation to conduct the factor analysis. The correlation matrix revealed that all variables had at least one correlation coefficient >0.3 .

Principal component analysis

In exploratory factor analysis using PCA, 6 principal components were identified which had eigenvalues more than 1 which is also depicted in the scree plot [Figure 1 and Table 2]. Items 2, 1, and 3 loaded on factor 1 (work restrictions), items 13, 7, and 12 loaded on factor 2 (religious restrictions), items 11, 8, and 4 loaded on factor 3 (social restrictions), items 9 and 10 loaded on factor 4 (personal hygiene), items 5 and 6 loaded on component 5 (comfort), and question 15 loaded on component 6 (sexual activity). Question 14 did not load on any factor and was omitted.

DISCUSSION

Restriction of routine activities during menstruation is a conglomeration of traditional practices acquired over several centuries mediated by society, religion, and culture, with potential for positive, neutral, or negative influence on the health and well-being of women. The present study conducted among 1100 adolescent girls in Delhi observed nearly two in three participants complying with sociocultural restrictions and observing work-related restrictions during menstruation. The most common restrictions in the participants were in relation to religious activities, household activities, and personal hygiene.

In the present study, 60% of the participants reported missing school/academic work during menstruation, which is significantly higher compared to another Indian study which reported that only 24% of the adolescent girls missed

school during their menstrual cycles.^[16] Menstruation-related religious restriction among our study participants was very high (~90%). Another study conducted in the city of Mumbai reported that 97.6% of the women experienced religious restrictions during menstruation.^[17] However, a meta-analysis of Indian studies reported the pooled prevalence of religious restriction events during menstruation in adolescent girls as 77% (95% confidence interval: 71%–83%).^[18]

Our study has found that social restrictions were there in 28% of the study participants which was similar to other Indian studies.^[18] A qualitative study done in Fiji, Papua New Guinea, and the Solomon Islands also reported the presence of similar menstruation-related restrictions.^[19]

Validated questionnaires for menstruation-related activity restriction were not available even after extensive literature search. Various researches done in this field used questions developed by the investigators themselves. Construct validation was done through exploratory factor methods using PCA with varimax rotation after assessing the suitability of the data for analysis. The items of the questionnaire loaded on six factors, namely work restrictions, religious restrictions, social restrictions, personal hygiene, comfort, and sexual activity.

There are few strengths to our study. First, this is the first study to validate the questionnaire for menstruation-related activity restriction among adolescent girls. Second, a large representative sample was selected using a multistage probability sampling technique, ensuring good external validity of study findings that are generalizable across similar settings, especially in Northern India. Third, construct validity of MRARQ was assessed using an iterative process with factor analysis.

Study limitations

Concurrent validity could not be assessed since another validated instrument for menstruation-related activity restriction was not available. We could not assess the test-retest reliability of the MRAR questionnaire. Finally, we did not assess the religiosity of the participants during the nonmenstrual period to assess the actual extent of religion-based behavior change in the menstrual period, and neither the effect of compliance with religious restrictions during menstruation on the participant's self-esteem, which require further qualitative exploration.

CONCLUSION

Adolescent girls in India experience a variety of social, cultural, work, and religion-related restrictions during menstruation, much of which is potentially avoidable through behavior change and health promotion interventions. The MRARQ is a useful tool which can be used among adolescent girls from low-middle income groups in Northern India.

Financial support and sponsorship

This study was financially supported by the National Health Mission, Delhi.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

- Puri S, Kapoor S. Taboos and myths associated with women's health among rural and urban adolescent girls in Punjab. *Indian J Community Med* 2006;31:31: 295.
- Garg S, Anand T. Menstruation related myths in India: Strategies for combating it. *J Family Med Prim Care* 2015;4:184-6.
- Kumar A, Srivastava K. Cultural and social practices regarding menstruation among adolescent girls. *Soc Work Public Health* 2011;26:594-604.
- Patil R, Agarwal L, Iqbal Khan M, Gupta SK, Raghavia M, Mittal A. Beliefs about menstruation: A study from rural Pondicherry. *Indian J Med Spec* 2011;2:23-6.
- Chandar D, Yamini M, Priyan S, Ganesh Kumar S. Awareness and practices of menstrual hygiene among females of reproductive age group in rural Puducherry-A mixed method study. *Int J Adolesc Med Health* 2018;doi:10.1515/ijamh-2017-0221. [Last accessed on 2020 Sept 07].
- Sadiq MA, Salih AA. Knowledge and practice of adolescent females about menstruation in Baghdad. *J Gen Pract* 2013;2:1000138. Available from: <http://dx.doi.org/100.4172/2329-9126.1000138>. [Last accessed on 2020 Sept 07].
- Phillips-Howard PA, Nyothach E, Ter Kuile FO, Omoto J, Wang D, Zeh C, *et al.* Menstrual cups and sanitary pads to reduce school attrition, and sexually transmitted and reproductive tract infections: A cluster randomised controlled feasibility study in rural Western Kenya. *BMJ Open* 2016;6:e013229.
- Janoowalla H, Keppler H, Asanti D, Xie X, Negassa A, Benfield N, *et al.* The impact of menstrual hygiene management on adolescent health: The effect of Go! pads on rate of urinary tract infection in adolescent females in Kibogora, Rwanda. *Int J Gynaecol Obstet* 2020;148:87-95.
- Hightower M. Effects of exercise participation on menstrual pain and symptoms. *Women Health* 1997;26:15-27.
- Schoep ME, Adang EM, Maas JW, De Bie B, Aarts JW, Nieboer TE. Productivity loss due to menstruation-related symptoms: A nationwide cross-sectional survey among 32 748 women. *BMJ Open* 2019;9:e026186.
- Goel P, Kumar R, Meena G, Garg S. Association of sociodemographic characteristics with KAP regarding menstrual hygiene among women in an urban area in Delhi. *Trop J Obstet Gynaecol.* 2018;35:158.
- Bolarinwa OA. Principles and methods of validity and reliability testing of questionnaires used in social and health science researches. *Niger Postgrad Med J* 2015;22:195-201.
- UNICEF. Early and Late Adolescence. Available from: <https://www.unicef.org/sowc2011/pdfs/Early-and-late-adolescence.pdf>. [Last accessed on 2019 Oct 09].
- Pandey VK, Aggarwal P, Kakkar R. Modified BG Prasad Socio-economic Classification, Update -2019. *Indian J Community Heal* 2019;31:123-5. Available from: <https://www.iapsmupuk.org/journal/index.php/IJCH/article/view/1055/906>. [Last accessed on 2020 Sept 07].
- StataCorp. Stata Statistical Software: Release 11. College Station, TX: StataCorp LP; 2009.
- Sharma P, Singh N, Tempe A, Sharma S. Knowledge, practices and restrictions related to menstruation in young girls: A study from North India. *Int J Community Med Public Heal* 2018;5:3340.
- Thakur H, Aronsson A, Bansode S, Stalsby Lundborg C, Dalvie S, Faxelid E. Knowledge, practices, and restrictions related to menstruation among young women from low socioeconomic community in Mumbai, India. *Front Public Health* 2014;2:72.
- van Eijk AM, Sivakami M, Thakkar MB, Bauman A, Laserson KF, Coates S, *et al.* Menstrual hygiene management among adolescent girls in India: A systematic review and meta-analysis. *BMJ Open.* 2016 Mar 1;6(3):e010290. Available from: <https://bmjopen.bmj.com/content/6/3/e010290>. [Last accessed on 2020 Sept 07].
- Mohamed Y, Durrant K, Huggett C, Davis J, Macintyre A, Menu S, *et al.* A qualitative exploration of menstruation-related restrictive practices in Fiji, Solomon Islands and Papua New Guinea. *PLoS One* 2018;13:e0208224.