



Predictors of Knowledge Regarding Puberty and Menstruation among Females of Reproductive Age Visiting Public Health Care Institute of Rawalpindi, Pakistan

Taskeen Mansoor, Rehama Gilani, Maham Zahid

National University of
Medical Sciences (NUMS)

Corresponding Author:

Taskeen Mansoor

Email:

taskeen.mansoor@numspak.edu.pk

Abstract

Background: In this questionnaire based cross sectional survey, the researchers aimed to identify the sociodemographic predictors of knowledge regarding puberty and menstruation among females of reproductive age visiting a public healthcare institute.

Methods: Using non-probability sampling, a self-designed, pretested and validated interviewer administered questionnaire in Urdu language was used to collect data from females of reproductive age (18-55 years) visiting the Gynecology outpatient department of tertiary care hospital in Rawalpindi, Pakistan from November 2019 to March 2020.

Results: Descriptive and inferential analysis using SPSS v. 21.0 revealed that 288 female participants with mean age 30.30 ± 8.98 years participated in the study, out of which 48.6% of the participants had adequate knowledge regarding puberty and menstruation. The knowledge score was significantly higher among married females (67.7%), those living in urban areas (68.3%), having nuclear families (63.2%), and females with more than 12 years of education (69.9%), employed females (92.2%) and those with higher family income (83.3%). Binary logistic regression showed women living in urban setting were 4.01 times more likely to have good knowledge about puberty (OR 4.01, 95% CI 2.03-8.10, $p < 0.001$) and menstruation and working women were 16.5 times more likely to have adequate knowledge (OR 16.5, 95% CI 1.5-181.7, $p = 0.022$).

Conclusion: The inadequate knowledge of females may be attributed to misconceptions regarding menstruation due to poor access to health-related education and a culture of silence around sexual and reproductive health issues. Systemic integration of adequate menstrual socialization at homes and in schools can change the discourse around sexual and reproductive health in the societal landscape. Future studies may explore health-information seeking practices of females from diverse socio-demographics to identify the sources and types of knowledge that they seek on female reproductive health issues.

Keywords: Female adolescents, menstruation, puberty, reproductive health

Introduction

Adolescence is a transition period between childhood and adulthood, related with growth spurt and pubertal changes, associated with sexual and reproductive health issues and myths. Female adolescents identify puberty and onset of menarche as unpleasant experiences in their lives. A scoping review of evidence related to knowledge of puberty and menstruation among female adolescences in low and middle income countries reported inadequate knowledge and young girls are under-prepared for puberty and menstruation.(1) This inadequate preparation and focus on negative aspects of menarche(2) contributes to unhygienic practices and a poor attitude towards menstruation (3) that have been linked to adverse health and social outcomes.(4) It is also reported that societies where communication about menstruation is delegated from medical professionals to less knowledgeable media, the subject remains cloaked in stigma, mystery and fear.(2) Meta-analysis exploring the role of mothers in informing girls about puberty has shown that mothers are the primary source of information regarding puberty and menstruation.(3) A recent survey study conducted in Pakistan(5) reported that the information shared by mothers and sisters related to menstruation may not be reliable owing to their lack of awareness or inadequate command over the subject. Another study of Pakistan has discussed role of mothers, in South Asian cultures, in reinforcing the myths and taboos surrounding menstruation. While socializing with female adolescents, the mother's influences attitude formation around sexual health and an inferior quality and quantity of the information. (6) Along with the stigma attached to talking about sexual and reproductive health issues, the mother's reluctance to discuss menstruation with daughters can be partially related to their own lack of knowledge of the physiology of menstruation.(7)

Female puberty and menstruation related issues have been discussed worldwide in diverse disciplines. Women's sexual and reproductive health issues are traditionally tabooed in South Asian cultures (8) and even among women, there are rarely any discussions on menstruation, breast health issues, sexual and reproductive health. Therefore, this research attempts to add to the debate from a South Asian and more specifically Pakistan's perspective. Looking at the awareness of female adolescents and adults, the

objective of this study was to explore the association between level of knowledge related to puberty and menstruation and socio-demographics.

Methodology

This prospective cross-sectional study was conducted at the Gynecology outpatient department (OPD) of tertiary care hospital in Rawalpindi from November 2019 to March 2020. The NUMS ethical review committee approved the study. The sample size was calculated using formula $n = z^2pq/e^2 = (1.96)^2 \times (0.25 \times 0.75) / (0.05)^2 = 0.7203/0.0025 = 288$ with prevalence of knowledge about menstruation as 25%.(9) All females of reproductive age, ranging from 18 to 55 years of age, were eligible to participate in the study. Non-probability convenience sampling method was used to enroll the participants fulfilling the inclusion criteria. Consent for participation was taken from the study participants and researcher filled the questionnaire for each participant while interviewing them. A self-designed, pretested, validated, interviewer-administered questionnaire translated in Urdu language, was used to assess the level of knowledge regarding puberty and menstruation from study participants. A score of (1) was given to the correct answer, and a score of (0) was considered for the wrong answer or "Don't Know" option. The highest score of knowledge was taken as twenty (20) and respondents who scored ten or more (≥ 10) were adjusted to have adequate knowledge and nine or less (< 9) were categorized as having inadequate knowledge.

The researcher coded the questions to minimize the error, and total score was calculated summing up the score for each question included in the questionnaire. Data was cleaned and entered into IBM SPSS (version 23.0) data management software. The outcome/dependent variable for this study was the knowledge score, while independent predictor variables included age, marital status, residence, family structure, educational level, employment status and family income. The descriptive statistics for continuous variables was presented as mean and standard deviation while for categorical variables frequencies and percentages were reported. Univariate analysis was performed to find association between dependent and each independent variable for which odds ratio and 95% confidence intervals were reported. For multivariate analysis, binary logistic regression was performed to construct predictive model for

independent variables found to be significantly associated in univariate analysis. A value of ≤ 0.05 was considered to be significant in this study.

Results

Demographic characteristics

A total of 288 female participants were enrolled in the study, with mean age of 30.30 ± 8.98 years (age range 18 to 55). Out of 288 participants, 226 (78.5%) were married, while 62 (21.5%) were unmarried; 143 (49.7%) of them belonged to rural areas while 145 (50.3%) were from urban settings; and 174 (60.4%) and 114 (39.6%) were living in joint and nuclear families respectively. There were 24 (8.3%) females with no formal schooling, 18 (6.3%) had primary education, 57 (19.8%) had secondary education, 76 (26.4%) went to college and 113 (39.2%) had graduation or above level of education. Majority of the female participants were housewives 204 (70.8%), while 70 (24.3%) and 14 (4.9%) were students and working respectively. Other socio-demographic characteristics of the study population are summarized in table 1.

Knowledge about puberty

Knowledge of female participants about puberty and menstruation is summarized in table 2. Almost half of the study participants 140 (48.6%) had adequate knowledge and remaining 148 (51.4%) had poor knowledge regarding puberty changes and menstruation. Mean knowledge score for participants with adequate knowledge was 13.65 ± 2.61 while for participants with poor knowledge it was 6.35 ± 2.38 out of 20 ($p < 0.001$). Comparison of knowledge regarding puberty and menstruation with socio-demographic variables among the study participants is given in table 2. Level of knowledge was found to be significantly better among married females ($p = 0.001$), living in nuclear families ($p < 0.001$), with more than 12 years of education ($p < 0.001$), living in urban areas ($p < 0.001$), students and working women ($p < 0.001$), and have a family income of more than 50,000 rupees ($p < 0.001$). In terms of age, group comparison revealed that younger females possessed better knowledge regarding pubertal changes and menstruation ($p = 0.002$).

Socio-demographic predictors of knowledge

Univariate analysis showed significant association between knowledge regarding puberty/menstruation and age, marital status, family structure, educational

status, residence, province, profession and family income as shown in table 3. Whereas multivariate analysis revealed residence (urban settings), family income (50,000-100,000 and $> 100,000$ per month) and profession (working women) to be significant predictors of knowledge about puberty and menstruation. Women living in urban setting were 4.01 times more likely to have good knowledge about puberty (OR 4.29, 95% CI 2.43-7.58, $p < 0.001$) and menstruation, similarly working women were 10.09 times more likely to have good knowledge (OR 10.09, 95% CI 1.15-88.65, $p = 0.037$) and participants with family income of 50,000 – 100,000 and more than 100,000 PKR per month were more aware as compared to others (OR=7.45, 95% CI 2.43-22.82, $p = 0.001$ and OR=9.72, 95% CI 1.53-61.32, $p = 0.016$) as shown in table 4.

Table 1. Socio-demographic characteristics of the study participants (n=288)

Sr. No.	Socio-demographic characteristics	Frequency/percentages n(%)
1.	Age in years (mean \pm sd)	30.30 \pm 8.98
2.	Marital Status n(%) • Single • Married	62 (21.5%) 226 (78.5%)
3.	Family Structure n(%) • Nuclear • Joint	114 (39.6%) 174 (60.4%)
4.	Educational Status n(%) • No formal schooling • Primary • Secondary • College • Graduation and above	24 (8.3%) 18 (6.3%) 57 (19.8%) 76 (26.4%) 113 (39.2%)
5.	Residence n(%) • Rural • Urban	143 (49.7%) 145 (50.3%)
6.	Province: • Punjab • KP • Sindh • AJK	243 (84.4%) 8 (2.8%) 21 (7.3%) 16 (5.6%)

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7.	Profession		9.	Family income	
	• Student	70 (24.3%)		n(%)	
	• Working	14 (4.9%)		• <30,000	47 (16.3%)
	• Housewife	204 (70.8%),		• 30,000 – 50,000	180 (62.5%)
8.	Family income in Rupees (mean±sd)	49,305±34,903		• 50,001 – 100,000	49 (17.0%)
				• >100,000	12 (4.2%)

Table 2. Summary of knowledge regarding puberty and menstruation among study participants (n=288)

Sr. No.	Knowledge Questionnaire	n(%)
Knowledge about puberty		
1.	In your opinion, what is puberty?	
	• Only physical growth of girls	52 (18.1%)
	• Only physical growth of boys	17 (5.9%)
	• Physical and emotional growth of boys and girls	224 (77.8%)
2.	In your opinion, what is the cause of physical changes during puberty?	
	• Dietary practices (eating hot or cold foods)	190 (66.0%)
	• Hormonal changes in the body	168 (58.3%)
	• Environmental changes (polluted water and wind)	69 (24.0%)
3.	In your opinion, what are the some of the physical changes that come about during puberty?	
	• Increase in height	116 (40.3%)
	• Widening of the chest	155 (53.8%)
	• Acne/pimples on the face	162 (56.3%)
	• Start of menstruation	236 (81.9%)
	• Emergence of hair on armpits and pubic area	112 (38.9%)
Knowledge about menstruation		
4.	In your opinion, during the menstrual cycle, what is being discharged from the body on a monthly basis?	
	• Blood	261 (90.6%)
	• Blood and uterine lining	50 (17.4%)
	• Pieces of flesh	56 (19.4%)
5.	In your opinion, what is the source of menstrual blood being discharged from the body?	
	• The area below the abdomen	114 (39.6%)
	• Uterus	131 (45.25%)
	• Ovaries	9 (3.1%)
6.	In your opinion, what is the age at the first episode of menarche/periods?	
	• 7-9 years	99 (34.4%)
	• 10-14 years	109 (37.8%)
	• 15-19 years	66 (22.9%)
7.	What was your first/ primary source of information related to menstruation?	
	• Family Members: Mother, Sister, Brother, Father	275 (95.5%)
	• Peers, Friends or Relatives	29 (10.1%)
	• Health care professional (Doctor, Nurse etc)	4 (1.4%)
	• School (Students, Teachers)	19 (6.6%)
	• Television/Newspapers/Books	4 (1.4%)
	• Internet/Social Media	21 (7.3%)

Table 3. Comparison of knowledge with sociodemographic characteristics

Sr. No.	Sociodemographic variables	Knowledge Status		P value
		Adequate	Poor	
1.	Age in years (mean±sd)	28.62±7.36	31.88±10.05	0.002
2.	Marital Status n(%) • Single • Married	98 (43.4%) 42 (67.7%)	128 (56.6%) 20 (32.3%)	0.001
3.	Family Structure n(%) • Nuclear • Joint	68 (63.2%) 72 (39.1%)	106 (36.8%) 42 (60.9%)	<0.001
4.	Educational Status n(%) • No schooling • Primary • Secondary • College • Graduation and above	- 8 (44.4%) 25 (43.9%) 28 (36.8%) 79 (69.9%)	24 (100.0%) 10 (55.6%) 32 (56.1%) 48 (63.2%) 34 (30.1%)	<0.001
5.	Residence n(%) • Rural • Urban	41 (28.7%) 99 (68.3%)	102 (71.3%) 46 (31.7%)	<0.001
6.	Province: • Punjab • KP • Sindh • AJK	118 (48.6%) 8 (100%) 6 (28.6%) 8 (50.0%)	125 (51.4%) - 15 (71.4%) 50.0%)	0.008
7.	Profession • Student • Working • Housewife	43 (61.4%) 13 (92.9%) 84 (41.2%)	27 (38.6%) 1 (7.1%) 120 (58.8%)	<0.001
8.	Family income in Rupees (mean±sd)	59,550±43,537	39,614±19,787	<0.001
9.	Family income n(%) • <30,000 • 30,000 – 50,000 • 50,001 – 100,000 • >100,000	7 (14.9%) 89 (49.4%) 34 (69.4%) 10 (83.3%)	40 (85.1%) 91 (50.6%) 15 (30.6%) 2 (16.7%)	<0.001

Table 4. Socio-demographic predictors of knowledge regarding puberty and menstruation; multivariate analysis

Predictors	OR	95% CI	P value
Residence (Urban)	4.29	2.43-7.58	<0.001
Profession (Employed)	10.09	1.15-88.65	0.037
Family income • 52,000-100,000	7.45	2.43-22.82	0.001
• >100,000	9.72	1.53-61.32	0.016

Discussion:

Female adolescents, owing to inadequate preparation and knowledge of menstruation, have had to face shame, guilt and trauma on the onset of their menses. This study explored the level of awareness of female adolescents and adults regarding female reproductive anatomy, pubertal changes and menstruation process. The results highlight the association of socio-demographic factors like age, education level, marital status and rural/urban residence with level of menstrual and pubertal knowledge. Along with comparison of results with similar studies, the

discussion below provides an understanding of factors within the South Asian cultural context that influence menstrual socialization and knowledge.

The results of this study are similar with diverse researches conducted on knowledge of puberty and menstruation focused on female adolescents. Studies that have included adult women as part of the sample usually asked questions about menstrual history of their daughters, data of which was supplemented with the overall findings of studies. Similar to another study, (10) majority of the females in this study also stated that origin of bleeding is through uterus. They reported age at first menarche to be 12-14 as is also reported in another Pakistani study conducted in urban Karachi. (11) The initial perception of majority of the girls in an Indian survey (12) regarding menstruation was that it is a life-threatening disease but after experiencing menarche they believed that menstruation is a purging of body impurities; followed by a belief that it is a normal physiological process. A Pakistani study (13) also revealed similar results where majority of female adolescents regarded menstruation as a natural process. In a mixed methods Indian study (14), knowledge of women regarding menstrual hygiene was assessed, the sample of which also included adult women having young daughters. The said study revealed that the majority of the girls viewed menstruation as natural and a sign of womanhood and something to be proud of. In another Indian study (7), onset of menarche is associated with physical maturity and the ability to marry and reproduce. Menstruation is associated with taboos and restrictions on work, sex, food and bathing, but the taboos observed by most of the women were avoidance of sex and not participating in religious activities. Another Indian study (15) with female adolescents also revealed that girls did not know about the meaning of menstruation and associated it with bad/unclean blood and although they considered backache and pain in lower abdomen as common responses to menstruation. Age of the respondents and total family income seemed to have good correlation with their awareness regarding menstruation and related aspects. A scoping review (1) of puberty and menstruation knowledge among young adolescents in low- and middle-income countries discussed that girls had inadequate knowledge about menstruation and only a minority of studies were explicitly dealing with puberty. It also stated that majority of the girls obtained information about menstruation and/or puberty from their mothers.

Working mothers with more than 12 years of education have been shown to possess an adequate level of menstrual knowledge in this study. In a Nigerian survey study, girls' menstrual knowledge was positively associated with parental education, (16) their own education status (17) and an Indian survey study¹⁰ discusses how working mothers may have increased accessibility to information related to menstrual hygiene and reproductive issues, due to their exposure outside the home.

Similar to our study, there are highly significant differences reported by a Bangladeshi study (18) in the awareness regarding menstruation in urban and rural area highlighting the increased knowledge of and use of sanitary napkins and menstrual hygiene for urban females. An Indian study (19) also states that urban females treat menstruation as a natural phenomenon, are aware of the gap of periodic menstruation cycle and the age of menarche. Discussing how low socioeconomic status may contribute to lack of access to menstrual hygiene products and therefore inadequate knowledge about menstruation, an Indian study (20) revealed that a substantial proportion of girls shy away from talking about menses and the only limited knowledge is through their mothers. Instead of highlighting it as a natural biological process, menstruation, as a social construction, has been dealt with in secrecy and cultural norms act as a barrier to adequate menstrual socialization. According to a study conducted in Zambia (21), most females had scant awareness about female fertility cycle, were misinformed by peers, and therefore had traumatic experiences on their first menses; moreover, the girls didn't foresee a long-term impact of menstruation on their day-to-day activities, school life and self-worth.

Understanding menstrual awareness in South Asia, a study (22) discussed how female adolescents do not understand the physical process of menstruation did not know about source of bleeding and thought it was 'bad blood'. A Pakistani study (23) reveals that no participant had knowledge about the physiology and purpose of menstruation and the most frequent response was that bleeding occurs for few days and the reason behind this misconception is lack of proper information. These girls learn from their mothers or teachers who conveniently avoid the topic. On first menses, the usual awareness is around use of cloth and cautions about behavior towards men and boys. An Indian study (24) revealed how girls were ignorant about the female bodily processes and the use of

sanitary pads during menstruation which may be due to poor literacy level of mothers or absence of proper health education programmes in school.

In another study from Mexico (25) rural women were also the most likely to believe that menstruation should be managed with secrecy and this issue was more openly talked about in big cities than in rural areas. Similarly, a study from Sweden (26) highlights how women expressed menstruation as something you should have but should be kept hidden from others but through shared female experience of menstruation, women help one another to conceal it. A Nigerian study (27) commented on maternal socialization around sensitive issues like menstruation and said that compared with other topics, issues around sexual and reproductive health are uncomfortable for parents and therefore communication is indirect, involve more dominance and unilateral power assertion. This could be a reflection of the socialization process experienced by the mothers earlier in life and cultural similarities regarding chastity and the need to preserve family honor. Another Pakistani study (28) notes that due to inadequate awareness, misconceptions exist among a large number of adolescent females regarding the issues and the events of puberty. These misconceptions may be due to limited number of accesses to health-related informational resources like internet or health care professions. Various researches (29) conducted in other Muslim's countries also reveal inadequate awareness among adolescent females about pubertal body changes because of their socio-religious context. Discussing reasons for lack of awareness, an Indian study (30) states that the inadequate knowledge of mother was passed on to these young girls and correct knowledge will help them practice safe and hygienic menstrual practices and come out of traditional beliefs, misconceptions, and restrictions regarding menstruation.

Conclusion

In this study, the researchers have attempted to explore the socio-demographic factors that influence level of knowledge of females of reproductive age which includes mothers and female adolescent daughters. Married employed females from urban areas with higher family income and a greater number of years in education had adequate knowledge regarding puberty and menstruation. The inadequate knowledge of other women may be attributed to misconceptions regarding menstruation due to poor access to health-related

education, lack of preparation and poor practices surrounding menstruation. These are key impediments to female self-confidence and personal development.

The culture of silence around sexual and reproductive health issues and lack of access to menstrual hygiene products is a major influencing factor that leads to inadequate awareness. Cultural norms restrict information regarding menses to girls of pre-pubertal age as they are considered too young to talk about sexual and reproductive health. Formal education about reproductive health is very limited in South Asia. Menstrual socialization usually entails discussion on gender and religious norms and not the physiological aspects of menstruation, which can increase awareness and help girls make informed choices. The need is to include all relevant stakeholders that comprise of female adolescents, their mothers and teachers to encourage facilitative dialogue around sexual and reproductive health issues so that girls are adequately aware about female bodies and menstruation. Systemic integration of menstrual socialization at homes and in schools can change the discourse around sexual and reproductive health in the societal landscape and can contribute to an increase in awareness and knowledge about menstruation.

In diverse studies on female reproductive health issues, the researchers had highlighted the significant role of mothers in socializing female adolescents regarding puberty and menstruation. We recommend that future studies explore health-information seeking practices of females from diverse socio-demographics to identify the sources and types of knowledge that they seek on female reproductive health issues.

Conflict of Interest

There is no conflict of interest to be declared.

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