International Journal of Community Medicine and Public Health
Sunil KA et al. Int J Community Med Public Health. 2021 Aug;8(8):3916-3926
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20213022

Original Research Article

Awareness and management of menstrual hygiene practices in adolescent girls

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Received: 07 July 2021
Revised: 15 July 2021
Accepted: 16 July 2021

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ABSTRACT

Background: Menstruation is a natural part of the female reproductive cycle in which periodic discharge of blood from the uterus exits through the vagina. Menstruation is also surrounded with social taboos and supernatural beliefs. The poor knowledge and understanding of menstruation may lead to unsafe hygienic practice that in turn increases the risk of reproductive and genito-urinary tract infections and leads to overall poor quality of life. The aim of this study was to compare the awareness about menstrual hygiene management among adolescent girls along with objectives of evaluation of menstrual hygiene practices.
Methods: The study was a prospective observational study done with a sample size of 650 subjects of 9 to 18 age group in whom menstruation already occurred who were recruited from five different schools in regions of Pathanamthitta and Alappuzha. The study was conducted in 3 phases, where initially a pre designed well-structured questionnaire was provided to assess the attitude, awareness and practices.
Results: The results obtained described that the subjects had better knowledge and positive attitude regarding menstruation and hygiene practices when compared to subjects from other regions of India but still they lacked some adequate and updated information on menstruation.
Conclusions: This study paved a way for discussion on menstruation to the adolescent girls, providing them the information they lacked and a better guidance.

Keywords: Menstruation, Menstrual hygiene management, Awareness, Menarche, Symptoms, Irregularities

INTRODUCTION

Menstruation is the monthly shedding of the lining of a woman's uterus consisting of blood and tissue which flows out of the uterus and exits through the vagina.[1] Women and adolescent girls experience menstruation every month. Ability to manage menstruation hygienically is fundamental to the dignity and well-being of women and is an integral component of basic hygiene, sanitation and reproductive health. Many consider menstruating women as dirty and contaminated, which has a great negative impact on their lives.[2]

Hygiene-related practices of women during menstruation are of considerable importance as it has an impact on health, increasing vulnerability to reproductive tract infections (RTI). Therefore, increased knowledge about menstruation right from childhood may ensure safe practices and help in mitigating the suffering of millions of women.[1] In recent years the importance of health counselling for adolescents has been appreciated but there

are no large-scale community-based studies to assess awareness about menarche and reproduction in Indian adolescent girls.

With the above background, this study was undertaken to elicit the knowledge regarding menstruation, restrictions practised, menstrual hygiene management during menstruation among the study population.[11]

METHODS

A prospective observational study was carried out for 6 months (November 2019 to April 2020) in 5 different schools of Pathanamthitta and Alappuzha districts, 650 adolescent girls were selected on the basis of age between 9 to 18 years excluding mentally and physically challenged participants with approval from the institutional ethical committee.

All subjects were provided with a brief introduction regarding the study and the confidentiality of data was explained to the subjects. A pre-counselling section was carried out in each school using a previously designed questionnaire. Based on the result obtained, after a month changes in the menstrual practices were assessed through a post-counselling questionnaire. Data collected was entered as well as statistically analysed in Microsoft excel 2010.

Sample size=$\frac{\frac{z^2 \times p\,(1-p)}{e^2}}{1+\frac{z^2 \times p\,(1-p)}{e^2 N}}$.

RESULTS

Here 53% of subjects had a monthly income between ₹10,000-50,000, 31% had a monthly income of less than ₹10,000 and 16% had a monthly income more than ₹1,00,000.

49% belonged to upper-middle class, 48% belonged to middle class, 2% belonged to upper class and 1% had a low social status level.

61% of subject's mothers were educated in the teritary level, 20% mothers were educated in the primary level and 19% mothers were educated in the secondary level.

66% of subjects were restricted to visit holy places during menstruation, 9% experienced restriction to access holy places and holy books, 8% experienced untouchability and restriction to access holy places, 7% experienced restriction to access holy books.

62% agreed that the counselling has improved their understanding towards menstruation, whereas 29% tried to cope with restrictions and 9% revealed that they are not able to adjust.

37% of subjects received awareness from their mother, 16% received awareness from their friends, 14% received awareness from mother, friends and social media, 14% received awareness from mother and friends, 10% received awareness from mother, friends, teacher and siblings.

In pre-counselling 325 subjects were feeling normal and increased to 540 after counselling. In pre-counselling 249 were tensed and declined to 89 after counselling, 52 subjects considered menstruation to be curse of God before counselling was declined to 17 after counselling, 20 subjects who felt tensed and believed it to be curse of God before counselling was declined to 4 after counselling.

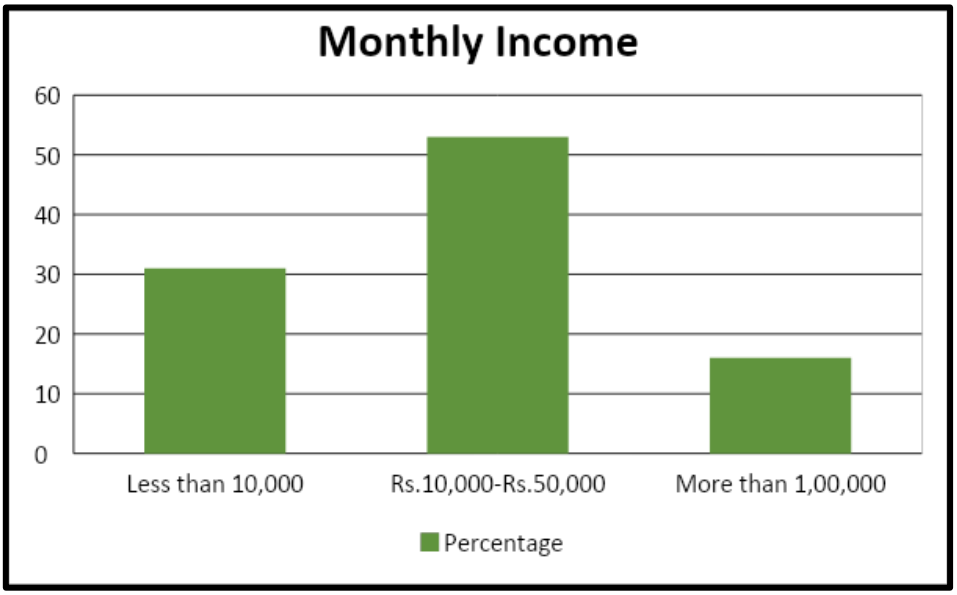

Figure 1: Monthly income of the family.

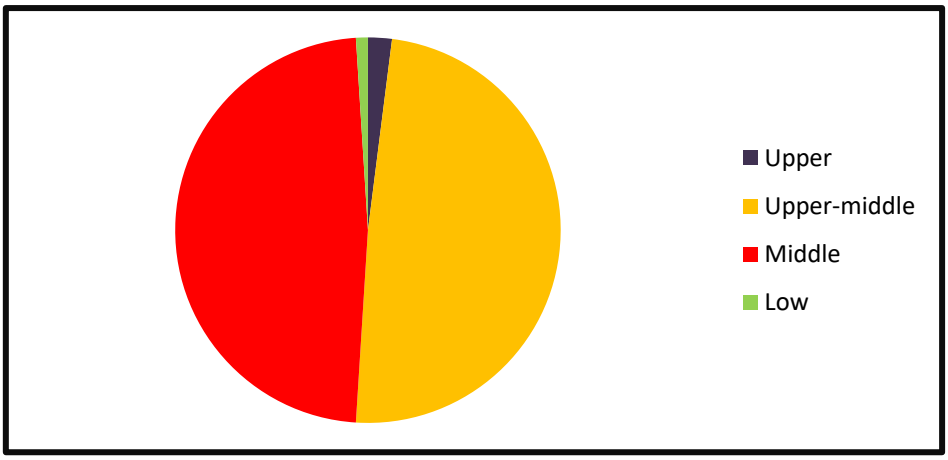

Figure 2: Social status.

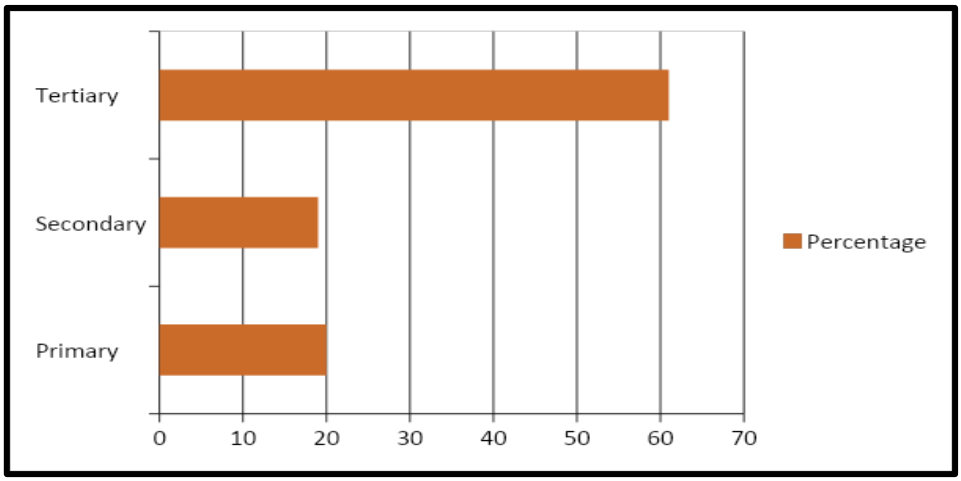

Figure 3: Mother's education.

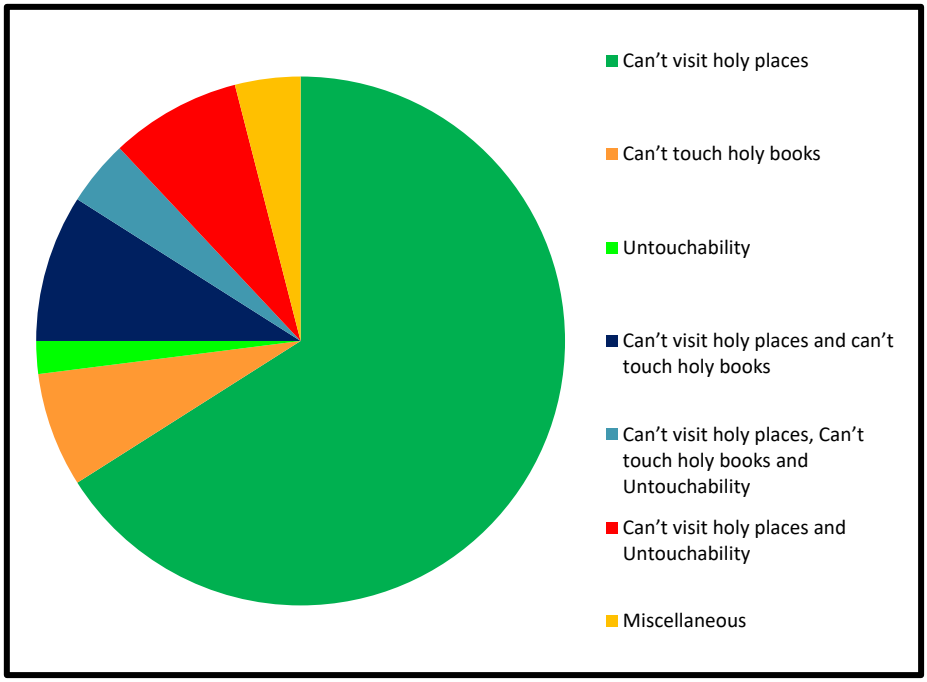

Figure 4: Type of restrictions at home.

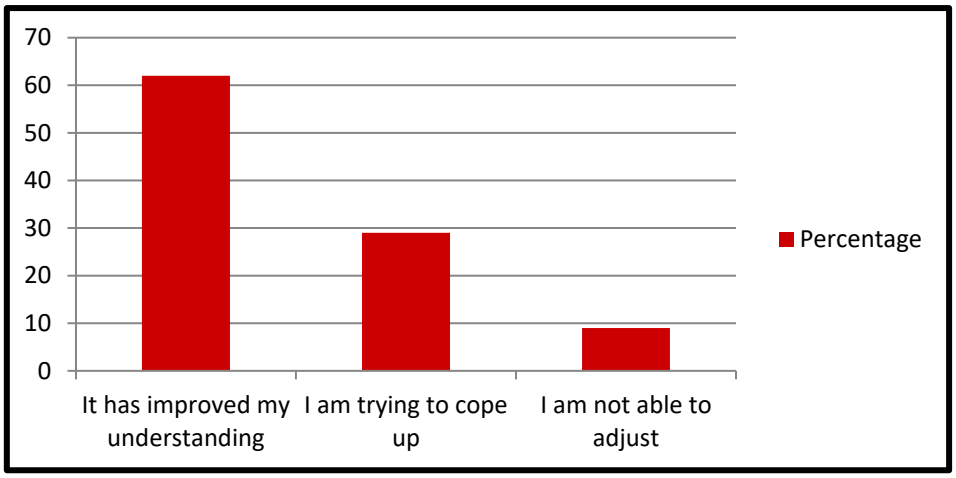

Figure 5: Attitude towards restrictions after counselling.

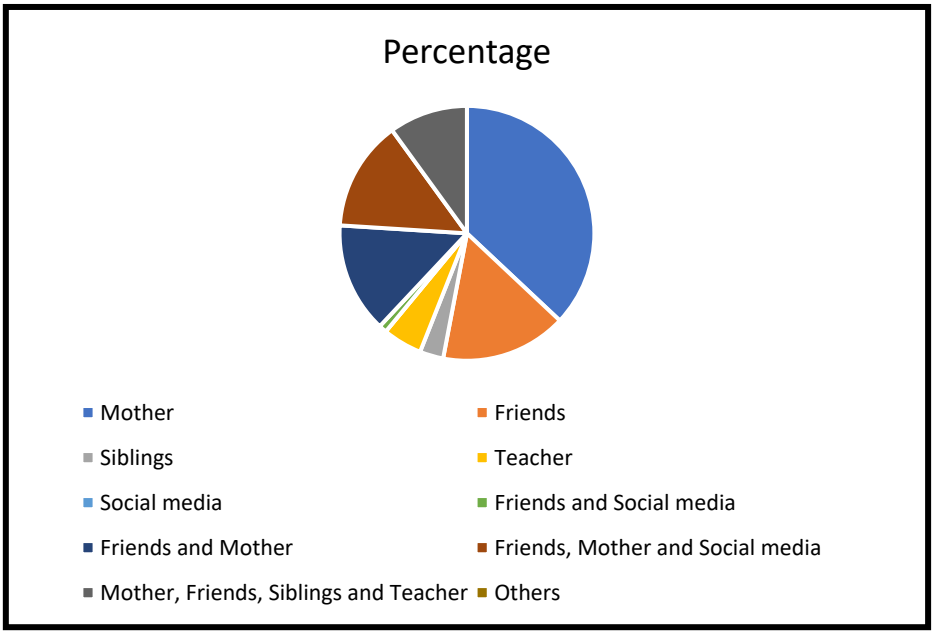

Figure 6: Source of awareness of subjects.

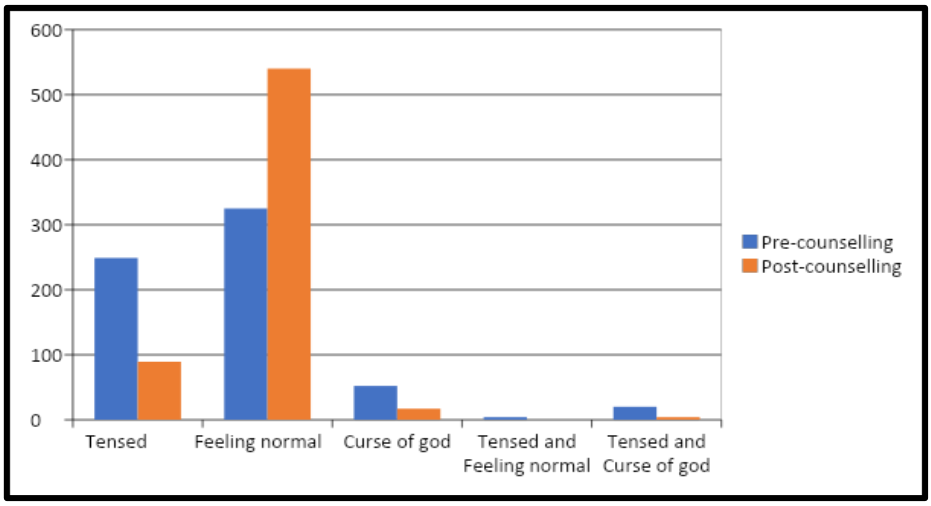

Figure 7: Attitude towards menstruation.

Table 1: Demographic details of the subjects.

Parameters		N (%)
Age (in years)	10-12	8
	13-14	32
	15-16	44
	17-18	16
Age of menarche (in years)	<9	1
	10-11	28
	12-13	58
	14-15	11
	>16	2
Days of menstruation	2	2
	2-5	65
	7	15
	2 times/month	7
	Break in between	11
Menstrual pattern	<21	11
	22-25	18
	25-30	40
	<30	31
Type of family	Joint	24
	Nuclear	76
Restrictions	Yes	52
	No	48
Awareness of menstruation	Yes	85
	No	15

Table 2: Hygiene management and additional information.

Parameters	N=650		Frequency
Maintenance of hygiene management	Pre counselling	Water only	135
		Soap and water	465
		Vaginal washes	48
	Post counselling	Water only	431
		Soap and water	193
		Vaginal washes	26
Kind of material used by subjects	Pre counselling	Sanitary pads	565
		Tampon	12
		Cloth	13
		Sanitary pads and cloth	56
	Post counselling	Sanitary pads	604
		Tampon	1
		Cloth	45
		Sanitary pad and cloth	0
Duration of usage of pads (in hours)	Pre counselling	<4	93
		4-6	360
		8	167
		12	30
	Post counselling	<4	171
		4-6	373
		8	98
		12	8
Ways of disposing used materials	Pre counselling	Throw it outside/ bin	35
		Burn them	505
		Bury them	24

Continued.

Parameters	N=650		Frequency
		Flush it out	35
		Don't know, my mom takes care of it	33
	Post counselling	Throw it outside/bin	107
		Burn them	440
		Bury them	9
		Flush it out	27
		Don't know, my mom takes care of it	67
No. of times of daily shower in study population	Pre counselling	Once daily	200
		Twice daily	450
	Post counselling	Once daily	160
		Twice daily	490
Source of menstrual blood	Pre counselling	Ovary	115
		Uterus	240
	Post counselling	Ovary	80
		Uterus	484
Additional information			
Method of cloth drying		Sundry	45
		Inside room	0
Awareness about menstruation from school		Yes	440
		No	210
Additional facilities for pad disposal in schools		Yes	563
		No	87
Comfortability in changing pads at school		Yes	251
		No	399

Table 3: Belief of participants about menstruation.

Parameters	Pre counselling (N=650)		Post counselling (N=650)	
	Yes (Frequency)	No	Yes (Frequency)	No
Feeling shy while discussing about menstruation	195	455	139	511
Belief whether beginning of menstrual blood is from stomach	295	355	86	564
Dangerous substances in menstrual blood	298	352	50	600
Thoughts if menstrual blood is impure	454	196	281	369
Disposal of used material after wrapping	593	57	632	18

DISCUSSION

The study aimed to identify different unhygienic practices, their knowledge and to provide relevant information about menstruation. This study was conducted among 650 students from 5 different schools (2 private, 3 government). It was observed that a majority of subjects (44%) were under the age group of 15-16 years, consistent with observations by Nagar et al in which age of majority of subjects were from 14-15 years (20%) and 16-17 years (41%).[3] 58% of subjects attained menarche in the age group of 12-13, while 28% of subjects attained menarche in the age group of 10-11 and 11% were in the age group of 14-15. However, 2% of subjects who attained menarche were above the age of 16 and only 1% of subjects who attained menarche were below age of 9. The findings are similar to the study conducted by Hemapriya et al where 53.8% of subjects attained menarche in the age group of 12 to 14.[4] 65% of population were seen to have 2-5 days of menstruation in each month, 2% had 2 days, 7% of subjects had certain changes as follows, break in between, 2 times in a month, 7 days in a month. Similar findings were found in the study conducted by Devi et al (3-5 days for 52 subjects).[5] According to medicine net, it was suggested that usually menstruation is for a duration of 7 days in the beginning and gradually shortens to 3 or 4 days.[1] In this study major population stood in the age group of 15-16 years which accounts as to why 65% of population had 2-5 days of menstruation. In this study menstrual cycle was 25-30 days in length for 40%, correlating with findings by Devi et al (26-28 days for 42 subjects) and Sridevi et al (55% had 26-28 days of gap in their menstrual cycle).[5,6] Normative data reports a 28 day gap between 2

consecutive cycles. 31% of subjects reported a gap of more than 30 days which may be due to some irregularity that requires medical consultation or it may normalise in adulthood. According to medical news today, menstrual cycle will be irregular until the age of 18 to 20 years due to change in physiology or transition from adolescent to adult.[1]

Privacy issues and non-compromising areas of life could be the probable reasons of change from joint to nuclear families. Here, 76% of subjects belonged to nuclear family and 24% of subjects belonged to joint family though they have acquired a good knowledge about menstruation from their mothers, similar to the study conducted by Deshpande et al where 77% of subjects belonged to nuclear family and 23% belonged to joint family.[7] Usually, subjects in the nuclear family may find a lack of space in finding answers for their queries about menstruation probably due to busy schedule of parents.

Among 650 subjects enrolled in the study, about 53% of subject's family had a monthly income between ₹10,000-50,000, followed by 31% of subject's family had a monthly income of less than ₹10,000 and 16% of subject's family had a monthly income more than ₹1,00,000. In the study conducted by Mahajan et al 28% of subject's family had a monthly income of less than ₹5000, 28% had a monthly income of ₹5000-10,000, 21% had a monthly income of ₹10,000-15,000 and 23% had a monthly income of more than ₹15,000.[8] In the present study majority of subjects belonged to middle class and upper middle class social status along with commendable family background. Better menstrual hygiene measures were practised by the subjects as they had obtained knowledge from educated mothers, which was possibly because they belonged to upper-middle class whereas a lower social status would mean less access to education thereby diminished knowledge and different practices. 61% of subjects mothers were educated at the tertiary level whereas 20% of subjects mothers were educated at the primary level while 19% of subjects mothers were educated at the secondary level. A majority of subjects mothers were educated at the tertiary level which explains women have emerged to be self-reliant in the years. This was different from other states in India, in Jammu and Kashmir where it was noted that 36.36% of subjects mothers were illiterate followed by 30.33% educated at the middle level followed by 23.48% educated at the secondary level and 1.51% educated at the tertiary level (Kapoor et al).[9] This variation would have risen probably due to higher literacy rate in the state of Kerala. Moreover, monthly income always plays a lead role in accessibility to better sanitary practices and products. Also according to Huisman et al household level factors influence the level of knowledge each families possesses mainly socioeconomic factors.[10] In the present study, 49% of subjects belonged to upper middle status, 48% of subjects belonged to middle social status, 2% of subjects belonged to upper social status and 1% of subjects belonged to low social status and overall had less restrictions compared to a study conducted by Kavitha et al where 75.9% of subjects belonged to lower-middle status, followed by 16.7% of subjects from middle class and 7.4% of subjects from upper-middle class and while considering restrictions it was observed that 76.5% of subjects experienced restrictions at home.[11]

Many myths and taboos still remain about menstruation which explains why restrictions still remain at home. Here 52% of subjects experienced restrictions at home during menstruation whereas 48% of subjects did not experience any. The ratio of yes to restrictions is higher than no to restrictions which clearly demonstrated the need for a change of attitude to no to restrictions through counselling and better understanding of the process. A study conducted by Kapoor et al found that 98.48% of subjects belonging to lower-middle class experienced restrictions at home.[9] Social status and restrictions could be related to one another. In the present study 49% of subjects belonged to upper-middle class and 48% of subjects belonged to middle class status and 52% of subjects experienced restrictions at home. About 66% of subjects were restricted to visit holy places during menstruation, 9% of subjects were not allowed to touch holy books and to visit holy places, 8% of subjects were found to follow untouchability and were not allowed to visit holy places, 7% of subjects experienced restriction to touch holy books. A study was conducted by Thakre et al where only 26.36% of the subjects did not practice any restrictions, 73.64% of subjects practiced different restrictions during menstruation.[12] Among them, 71.78% of subjects did not attend any religious functions or visit temples, 26.36% of subjects were not allowed to do the household work, 26.36% of subjects were not allowed to sleep on the routine bed.

In the present study, subjects were provided counselling on the background of why restrictions happen at home and how to cope up with them, the results were evident, about 62% of subjects have told that the counselling has improved their attitude towards restrictions, whereas 29% of subjects have told that they are trying to cope up and 9% of subjects told that they are not able to adjust. The change in attitude towards restrictions after counselling could also be because of an open and understanding discussion with their mothers.

A UNICEF study published by water aid has revealed that 1 out of 3 girls in South Asia knew nothing about menstruation prior to getting it while 10% of girls in India believe that menstruation is a disease.[13] The present study enrolled 650 subjects, of which about 85% of subjects were aware about menstruation before its first appearance and 15% of subjects were unaware of the same, this result may be due to the awareness they received regarding menstruation from different sources, social status also plays a part by providing better access to education. Contradictory results obtained in the study conducted by Paria et al where only 37.52% of subjects had awareness

about menstruation before its first appearance.[14] This contradictory can be due to the different regions surveyed and differences in the socioeconomic status and literacy status of the study subjects in the respective studies.

Out of 553 subjects who previously knew about menstruation before their first cycle, a majority of subjects 37% got information about menstruation from their mothers followed by 16% who got information from their friends. This result was similar to the study conducted by Nair et al which stated that 41% of subjects got information about menstruation from their mother and various other studies came up with similar supporting results.[15] In the present study most of the subjects' mothers were able to provide the required information because of their literacy level. Throughout the study subjects had a positive response, may be because mothers made them capable to face their adolescent years with ease.

About 68% of the population enrolled in the study stated that they got an awareness class about menstruation. In the study conducted by Das et al 55.5% of population got classes on menstruation from schools.[16] Positive attitude of this present society was evident in this study. In our current scenario people recognized the necessity of adequate knowledge about menstruation in adolescent girls and providing this knowledge to the young adolescent girl makes her more capable to face menstruation related difficulties. Since this study included an open discussion class it paved the way to more than half of the population to obtain a better picture about menstruation by gaining knowledge and clarifying their doubts.

In this study, a majority of 325 subjects considered it as a normal process, 249 subjects were tensed during the menstruation and 52 subjects considered it as curse of God before counselling, these results had positive correlation with the study conducted by Sultan et al 37% considered it as a physiological process whereas 22% considered it as curse of God.[17] The reason behind the result obtained in this study was due to a lack of adequate information about menstruation. After counselling, the number of subjects who felt tensed and considered it as a curse of God declined to a greater extent, 89 and 17 respectively and the number of subjects who considered menstruation as a normal physiology increased to 540.

During pre counselling 195 subjects were shy about menstruation, mostly because of the way they knew about menstruation, practices they had done during menstruation, the existing myths about menstruation and restrictions they followed during menstruation. Post counselling the number reduced to 139 subjects. A study conducted by Garg et al on "menstruation related myths in India" explored and found existing myths and the negative impacts they posed on menstruation.[18]

During pre counselling, 295 subjects stated that the origin of menstrual blood was from stomach and the rest 355 subjects disagreed, among this 115 subjects stated that menstrual blood began from ovary and 240 subjects stated that it was from uterus. From the studies conducted by Mitra et al 24% of subjects stated that menstrual blood comes from abdomen, 2% of subjects stated it comes from uterus, 73% of subjects did not know about the source and in the study conducted by Singh et al and 56.5% of subjects didn't know the origin of menstruation.[19,20] After counselling, 564 subjects were aware that menstrual blood does not come from stomach and out of this, 484 subjects said that menstrual blood came from uterus and the rest claimed that it was from ovary. From this result, importance of proper education was evident. Here awareness programs about menstruation played a role which should be given separately to both parents and children in order to make the future generation healthy. The belief that menstrual blood contained dangerous substances has passed on from generations. Proper counselling regarding false belief and concepts was required. The present study conducted had found that majority of the subjects did not consider menstrual blood to contain dangerous substances though before counselling 298 subjects considered the presence of dangerous substances in menstrual blood post counselling results reveal a dramatic decline in their belief. According to study conducted by Yang et al analysis of menstrual blood has showed that it contained proteins and that it was devoid of any dangerous substances.[21] According to studies conducted by UNICEF and healthline myth that 'menstrual blood is impure' still exists in our society.[13,22] According to ancient myths around the world, women during menstruation were not allowed to touch flowers and cook bread because it was believed that during menstruation menotoxin was released. In the present study there was a great decline in subjects who considered menstrual blood to be impure (from 454 to 281) and rapid increase for the ones who already considered it to be pure (from 196 to 389), which shows the importance of proper education among children, added to which is their positive attitude towards understanding the process and adapting towards the change. In an article published by Garg et al regarding menstruation related myths in India, it was found that the perception that menstrual blood as impure, still persist.[18]

Out of 650 subjects enrolled in the study, 200 subjects took bath only once daily and 450 subjects had bath twice a day. In this study, vast majority of the population took bath twice per day. This may be because of the information they got about menstrual hygiene and it helped them to avoid various reproductive problems occurring due to unhygienic practises. In the study conducted by Sadiq et al in Baghdad 13.3% took bath once a day while 22.6% did not take bath during menstrual cycle and provided justification that bathing during menstrual flow is harmful to them and some suggested that bathing will increase menstrual flow, but the study conducted by Bharthi et al found that hot water bath relieves menstrual pain.[23,24] This information was provided to subjects and twice daily bath increased from 450 to 490 post counselling. 465 subjects used both soap and water, 135 subjects used only water and 48 subjects

used vaginal washes to clean their genital parts. Similar results were found in the study by Sowmya et al which states 88.9% use soap and water whereas the study conducted by Sridevi et al found 63.2% use water and 36.7% use both soap and water to clean their external genitals.[6,25] According to American college of obstetricians and gynaecologists, use of soap in genital part was harmful because vagina has its own cluster of bacteria to protect it and these bacteria's get destroyed in alkaline pH.[30,31] Based on this information, in post counselling, the number of subjects who used both soap and water to clean their genital part were reduced to 193 subjects and usage of water alone was increased to 431 subjects followed by usage of vaginal washes reduced to 26 subjects. This question assessed the knowledge of parents or society, such type of scientific reasons can be provided with the help of an awareness programme.

In the study, during pre counselling a majority of 565 study population used sanitary pads as adsorbents, 12 used tampons and 13 subjects used cloth during menstruation. Similar results were found in the study done by Deshpande et al 60% of population used sanitary pads and in the study conducted by Sridevi et al 39.9% used sanitary pads.[6,7] The kind of material used depended upon the awareness they acquired, their income, culture and availability of sanitary pads. After counselling 604 subjects used sanitary pads, 45 subjects used cloths during menstruation.

While discussing about the type of adsorbents during pre counselling, few subjects mentioned about the usage of cloth other than adsorbents. From the study done by Kaur et al proper method about the usage of cloth had been identified.[26] The subjects were counselled that reusable cloth or pads must be hygienically washed and dried in the sunlight. The sun's heat was a natural sterilizer and drying the cloth or cloth pads under sunlight sterilizes them for future use. During post counselling all the 45 subjects who used cloths chose sun light to dry the cloth after washing it properly.

In this study, majority of the study population (360 participants) changed their adsorbents 4-6 hours daily, that is, 3-4 pads per day, 167 participants changed it after 8 hours, 93 participants changed it in less than 4 hours. In contrast to this, in the study conducted by Fehintola et al most of the subjects (55%) changed their adsorbents once daily followed by 26% of subjects who changed it twice daily and 19% of subjects changed more than 3 pads in a day.[27] This was based on different factors such as usage of more pads should be affordable to them, availability of pads in particular area, their knowledge about menstruation, their personal hygiene habits. It was good to change pads at every 4 hours or it should be used maximum for 4-6 hours, to avoid irritation, itching and reproductive infections.[32,33] Based on the aforementioned facts, counselling provided and during post counselling, 373 subjects changed it in duration of 4-6 hours followed by 171 changed within 4 hours. The number of subjects who changed pads in the duration of 12 hours reduced from 30 to 8.

In the present study, 593 subjects wrapped used adsorbents with paper, plastic or some other material before disposing it. Around 505 subjects stated that they burn the used material, 35 subjects said they threw it in the bin, 24 subjects said they bury them, 34 subjects flushed it in toilet and for the rest 33 subjects did not know about the disposal, as their mother handled it and this shows their awareness about menstruation. The study conducted by Udayar et al got similar results, where 58% threw used material in bin.[28] The study conducted by Kaur et al suggested that burning or burying pad in soil was also a good method but while burying it should not be wrapped in polyethene bags since it is non-biodegradable.[26] During counselling, they were advised to wrap used material before disposing and provided information about the ways of its proper disposal because this may help to prevent the spread of foul smell, spread of infections. In post counselling, 632 subjects said they wrapped used material before disposing and 440 subjects practiced burning and 107 subjects disposed it properly in dustbin.

87% subjects said they had proper additional facilities at their school for the disposal of used napkins and 61% of population felt discomfort in changing pads at school. Out of 5 schools, 3 of them had incinerators which are the best method for proper pad disposal. Similar results can be found in the studies in which majority of the subjects experienced the same discomfort with changing pads at school due to improper facilities (Kavitha et al, Rai et al).[11,29] Discomfort in changing adsorbents at school was a very awkward situation which can have a negative impact on a girl's mind. Therefore, this may be attributed to lack of enough washrooms or inadequate facility and cleanliness and calls upon the responsibility of society especially schools to provide proper facilities pads for pad disposal and provide comfort during menstruation. (Kaur et al discussed other techniques) like latrines with chutes, a special kinds of toilets with deep pits to which chemical agent was added to enhance the decomposition of adsorbents.[26]

Limitations

There were some limitations. Sample size obtained was smaller. Time attained for each session of the study was less. Unwillingness of the students to participate in the study. Uneasiness of subjects towards the study topic. Reluctance of schools to provide provision due to lack of time.

CONCLUSION

From this study it can be concluded that a majority of the subjects were found to have a change in attitude post counselling. Most of the students attained menarche at an early age and were aware of menstruation from their

mothers before achievement with additional knowledge from school. Subjects predominantly had a 2-5 days menstrual period with a 25-30 days cycle. Even though coming from fairly educated backgrounds, it was observed that a majority faced restrictions at home mainly in terms of visiting holy places. Post counselling, subjects a sense of normality and a decrease in shyness and feelings of being impure. They reported increased awareness in terms of source and hygiene maintenance. Though given additional facilities at school for management, a majority felt uncomfortable in changing at school.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Sunil KA, John AM, Saji A, Kumar BA, Thomas AA. Awareness and management of menstrual hygiene practices in adolescent girls. Int J Community Med Public Health 2021;8:3916-26.