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Addressing Challenges in Menstrual Hygiene Management Among Adolescent Girls: A Cross sectional study from Andhra Pradesh

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Abstract

Introduction: Menstrual hygiene management (MHM) is essential for women's reproductive health, particularly challenging for adolescent girls in low- and middle-income countries due to socio-cultural taboos and limited resources. This study aimed to assess MHM knowledge, attitudes, and practices among 480 adolescent girls in Andhra Pradesh, India, to inform targeted interventions.

Results and Discussion: The study uncovered significant disparities in menstrual knowledge and practices linked to socio-economic factors such as parental education and household income. While educational interventions offer promise, socio-cultural norms and economic disparities persist as barriers. Comprehensive interventions, including community-based programs and policy-level initiatives, are crucial to ensuring access to menstrual hygiene products and destigmatizing menstruation.

Conclusion: Immediate action is necessary to enhance MHM among adolescent girls in LMICs like Andhra Pradesh, India. Targeted educational and policy interventions can empower girls, improve their health outcomes, and promote gender equality, ultimately advancing overall well-being and socio-economic development.

Keywords: Menstrual hygiene management, Adolescent girls, Socio-economic factors, educational interventions, Reproductive health.

Introduction:

Menstrual hygiene management (MHM) is a crucial aspect of women's reproductive health, yet it remains a significant challenge, particularly among adolescent girls in low- and middle-income countries (LMICs). The World Health Organization (WHO) defines MHM as the access to menstrual hygiene products, facilities to dispose of them, and the ability to manage menstruation with dignity and safety. Despite its importance, many adolescent girls face barriers to effective MHM due to socio-cultural taboos, inadequate access to resources, and limited awareness about menstrual health (Kaur et al., 2018; Shah et al., 2023).

Numerous studies have shed light on the knowledge, attitudes, and practices related to MHM among adolescent girls in different settings. For example, Kaur et al. (2018) highlighted the social, cultural, and economic barriers faced by girls and women in LMICs, emphasizing the need for comprehensive educational interventions and access to menstrual hygiene products. Similarly, Majeed et al. (2022) conducted a meta-analysis focusing on Indian adolescent girls, revealing improvements in sanitary pad usage but prevalent menstrual disorders, underscoring the importance of educational interventions. In Ethiopia, Belayneh and Mekuriaw (2019) found a significant lack of knowledge and poor hygienic practices among adolescent school going girls, emphasizing the need for awareness creation programs. Chandra-Mouli and Patel (2017) mapped the knowledge and understanding of menstruation among adolescent girls in LMICs, highlighting the misconceptions and unhygienic practices prevalent due to inadequate preparation for menarche. These studies collectively underscore the urgent need for comprehensive educational interventions and awareness creation programs to enhance MHM among adolescent girls, particularly in LMICs (Chaudhury et al., 2021).

Moreover, socio-economic factors such as household income and parental education play a significant role in shaping menstrual knowledge and practices (Shumie & Mengie, 2022; Nwimo et al., 2022). Tribal communities in India face unique challenges, as highlighted by Chaudhury et al. (2021), who emphasized the need for educational interventions to dispel myths and promote safe MHM practices. Research on menstrual knowledge and practices among adolescent girls is crucial for understanding and addressing the challenges they face. Studies conducted in Pakistan (Shah et al., 2023), Nigeria (Nwimo et al., 2022), and India (M et al., 2023) have highlighted poor knowledge and suboptimal practices related to menstrual hygiene, indicating the need for targeted interventions. Despite efforts to improve MHM, challenges persist in various regions. In Northeastern Ethiopia, Habtegiorgis et al. (2021) found that while more than half of high school girls had good menstrual hygiene practices, there were still gaps in knowledge and practices. Similarly, in Ghana, Kpodo et al. (2022) found that despite good knowledge and practice of menstrual hygiene among participants, attending public and rural schools was associated with reduced odds of practicing good menstrual hygiene, suggesting the need for context-specific interventions.

In rural Gambia, Nabwera et al. (2021) identified factors such as heavy menstrual bleeding and inadequate water and sanitation facilities as influencing urogenital infections and depressive symptoms among schoolgirls. In Nepal,

Yadav et al. (2018) found that while knowledge about menstrual hygiene management was fair, there was room for improvement in attitude and practice. These studies underscore the multifaceted nature of MHM and the importance of addressing socio-cultural, economic, and environmental factors to promote safe and dignified menstrual practices among adolescent girls. In light of these challenges, this study aims to investigate the knowledge, attitudes, and practices related to MHM among adolescent girls in Andhra Pradesh, India, to inform the development of targeted interventions that promote safe and dignified menstruation in the region.

Material and Methods:

The study employed a multi-stage random sampling technique to select a representative sample of 480 girls studying in schools, with 240 from rural areas and 240 from urban areas. Initially, two revenue divisions, Tirupati and Madanapalli, were chosen. Subsequently, two schools each from urban and rural areas were selected within each revenue division. Finally, 10 respondents from each class (VIII, IX, and X) in each school were chosen, resulting in 30 girls per school. Ethical consent was obtained by visiting each school and explaining the purpose of the data collection to the school authorities. Cooperation was secured by emphasizing the research's importance and assuring that it was solely for research purposes. The inclusion criteria comprised girls who had reached puberty and were studying in classes VIII, IX, and X in both urban and rural areas. A total of 480 girls currently studying in classes VIII, IX, and X, with 240 girls from rural areas and 240 from urban areas, were included in the study, considering operational convenience, time, and resources.

Data collection utilized a structured interview schedule comprising open-ended and close-ended questions to gather responses from the girls. The schedule covered various aspects related to puberty and menstruation, including background characteristics, experiences and feelings during menstruation, knowledge and practices, taboos, and menstrual knowledge among mothers. Data were collected through in-depth interviews conducted by the researcher.

The collected data were analyzed using SPSS-21. One-way and two-way tables were prepared, and statistical tests such as Kruskal Wallis H Test, Mann-Whitney U tests, and correlation analyses were conducted to examine the relationship between socio-economic characteristics and dependent variables concerning girls' knowledge and perceptions of menstruation. P-values for the difference between proportions were calculated using the chi-square test. Additionally, indices were created to understand the cumulative influence of various factors on perceptions and knowledge related to menstruation.

Results:

1.1.Socio and demographic, personal details of the participants

Variables	Response	Frequency	Percent
Locality	Rural	240	50.0
	Urban	240	50.0
Class	VIII	160	33.3
	IX	160	33.3
	X	160	33.3
Social Status	FC	201	41.9
	BC	194	40.4
	SC	62	12.9
	ST	23	4.8
Religion	Hindu	437	91.0
	Muslim	21	4.4
	Christian	22	4.6
Age	Below 12 Years	106	22.1
	13 Years	134	27.9
	14 Years	194	40.4
	15 Years	46	9.6
Type of Family	Nuclear	415	86.5
	Joint	65	13.5

1.1.a. Socio and demographic, personal details of the participants

Father Educational Status	Illiterate	85	17.7
	Primary	69	14.4
	secondary	69	14.4
	Higher Secondary	139	29.0
	College	118	24.6
Father Occupation	Cooli	73	15.2
	Farmer	160	33.3
	Self-Employee	34	7.1
	Private Employee	47	9.8
	Government Employee	72	15.0
	Business	60	12.5
	Others	34	7.1
Mother Education	Illiterate	128	26.7
	Primary	77	16.0
	secondary	69	14.4
	Higher Secondary	137	28.5
	College	69	14.4
Mother Occupation	Housewife	297	61.9
	Self-Employee	26	5.4

	Private Employee	36	7.5
	Government Employee	20	4.2
	Business	19	4.0
	Others	82	17.1
No of Family members	1-4 Members	207	43.1
	5-6 Members	188	39.2
	7-9 Members	59	12.3
	Above 9 Members	26	5.4
Type of House	Kutch	25	5.2
	Semi-Pucca	93	19.4
	Pucca	362	75.4
Family Income	Below 50000	201	41.9
	50001 - 100000	157	32.7
	100001 to 150000	74	15.4
	Above 150001	48	10.0
Birth Order	First	287	59.8
	Second	145	30.2
	Third	48	10.0

Significance Level: p<0.00*, p<0.01**, p<0.05*, @=No significance**

The dataset (1.1 &1.1.a) presents a demographic snapshot encompassing various factors. It reflects an equal split between rural and urban respondents. In terms of education, Higher Secondary is the most common level for both fathers (29.0%) and mothers (28.5%). Agriculture emerges as the predominant occupation for fathers (33.3%), while the majority of mothers are housewives (61.9%). Nuclear families constitute the majority (86.5%), and Pucca houses are the most prevalent (75.4%). Financially, a significant portion of families earns below 50000 (41.9%), and first-born children are the most prevalent (59.8%). Religion-wise, Hinduism dominates (91.0%), followed by smaller proportions of Muslims (4.4%) and Christians (4.6%). Overall, the dataset encapsulates diverse demographic dimensions, offering insights into the socio-economic and cultural fabric of the surveyed population, with notable trends in education, occupation, family structure, and income distribution.

1.2.Menstrual Knowledge among school going girls with their personal details.

Variables	Response	N (480)	Mean	Statistical Values
Class	VIII	160	260.90	χ^2=44.117 *df*=2 P=.000***
	IX	160	275.45	
	X	160	185.15	
Social Status	FC	201	251.47	χ^2=13.618 *df*=3 P=.003**
	BC	194	249.25	
	SC	62	202.41	
	ST	23	173.52	
Religion	Hindu	437	245.53	χ^2=8.479 *df*=2 P=.014*
	Muslim	21	212.17	
	Christian	22	167.68	

Age	Below 12 Years	106	236.89	χ^2=2.166 *df*=3 P=.539@
	13 Years	134	241.64	
	14 Years	194	247.35	
	15 Years	46	216.61	

Significance Level: p<0.00*, p<0.01**, p<0.05*, @=No significance**

The provided data (1.2) examines menstrual knowledge among school going girls, correlated with various personal details through KWH test. There is significant disparities exist in menstrual knowledge across school classes (χ^2=44.117, p<0.00), with Class IX girls exhibiting the highest mean score (275.45), followed by Class VIII, while Class X girls show the lowest mean score (185.15). Differences are also evident based on social status (χ^2=13.618, p<0.01), with Forward Caste (FC) girls scoring the highest (251.47), followed by Backward Caste (BC), Scheduled Caste (SC), and Scheduled Tribe (ST) girls. Additionally, notable differences are observed among religious groups (χ^2=8.479, p<0.05), with Hindu girls demonstrating the highest mean knowledge score (245.53). However, there's consistent awareness across age groups, indicating equitable knowledge distribution regardless of age.

1.3. Menstrual Knowledge among school going girls with their family details.

Variables	Response	N (480)	Mean	Statistical Values
Father Educational Status	Illiterate	85	241.82	χ^2=1.804 *df*=4 P=.772@
	Primary	69	221.10	
	secondary	69	244.84	
	Higher Secondary	139	244.04	
	College	118	244.19	
Father Occupation	Cooli	73	246.16	χ^2=9.114 *df*=6 P=.167@
	Farmer	160	243.08	
	Self-Employee	34	265.44	
	Private Employee	47	215.47	
	Government Employee	72	214.47	
	Business	60	269.13	
	Others	34	230.46	
Mother Education	Illiterate	128	242.51	χ^2=2.188 *df*=4 P=.701@
	Primary	77	226.57	
	secondary	69	231.71	
	Higher Secondary	137	251.45	
	College	69	239.36	
Mother Occupation	Housewife	297	241.19	χ^2=4.361 *df*=5 P=.499@
	Self-Employee	26	245.12	
	Private Employee	36	237.99	
	Government Employee	20	254.03	
	Business	19	289.11	
	Others	82	223.08	
Type of House	Kutch	25	185.04	χ^2=6.325

	Semi-Pucca	93	228.43	*df*=2 P=.042*
	Pucca	362	247.43	
Family Income	Below 50000	201	235.06	χ^2=12.786 *df*=3 P=.005**
	50001 - 100000	157	268.02	
	100001 to 150000	74	207.61	
	Above 150001	48	223.97	

Significance Level: p<0.00*, p<0.01**, p<0.05*, @=No significance**

The provided data (1.3) examines menstrual knowledge among school going girls, correlated with various family details through KWH test. There's a significant difference (χ^2=6.325, p=0.042) with girls from Pucca houses exhibiting higher mean scores compared to those from Kutch or Semi-Pucca houses. Regarding family income of the girls it was found that there was a significant differences are observed (χ^2=12.786, p=0.005), with girls from families earning between $50,001 - $100,000 having the highest mean score, while those from families earning between $100,001 - $150,000 have the lowest. These findings underscore the influence of socioeconomic factors on menstrual knowledge, highlighting the importance of addressing disparities in access to menstrual health education and resources. In addition, the analysis reveals that while certain family details may have subtle associations with menstrual knowledge among school going girls, they do not significantly impact overall awareness. Girls with fathers educated up to Higher Secondary or College levels, and those with fathers in Business or Self-Employment, tended to have slightly higher mean scores. However, factors such as mother's education, occupation, number of family members, and birth order did not exhibit significant differences in menstrual knowledge. These findings suggest that other factors beyond family dynamics may play a more substantial role in shaping girls' understanding of menstruation. Further research is warranted to explore additional determinants influencing menstrual knowledge among school going girls.

1.4.Menstrual Practices among school going girls and with their personal details.

Variables	Class	N (480)	Mean	Statistical Values
Class	VIII	160	234.78	χ^2=7.030 *df*=2 P=.030*
	IX	160	224.31	
	X	160	262.41	
Social Status	FC	201	254.35	χ^2=17.848 *df*=3 P=.000***
	BC	194	210.84	
	SC	62	278.22	
	ST	23	268.00	
Religion	Hindu	437	234.40	χ^2=17.363 *df*=2 P=.000***
	Muslim	21	247.29	
	Christian	22	355.14	
Age	Below 12 Years	106	232.02	χ^2=15.440 *df*=3 P=.001**
	13 Years	134	209.14	
	14 Years	194	266.68	
	15 Years	46	240.98	

Significance Level: p<0.00*, p<0.01**, p<0.05*, @=No significance**

The provided data (1.4) examines menstrual practices among school going girls, correlated with various personal details and it was performed by the KWH test. Significant differences in menstrual practices are observed across different school classes (χ^2=7.030, p=0.030). Girls in Class X exhibit the highest mean score (262.41), followed by Class VIII, while Class IX girls demonstrate the lowest mean score (224.31). Similarly, there are significant variations in menstrual practices among girls from different social strata (χ^2=17.848, p<0.001). Forward Caste (FC) girls display the highest mean score (254.35), followed by Scheduled Tribe (ST) girls, while Backward Caste (BC) girls show the lowest mean score. Regarding religion, notable differences in menstrual practices are observed based on religion (χ^2=17.363, p=0.001). Hindu girls have a mean score of 234.40, Muslim girls have 247.29, and Christian girls have the highest mean score of 355.14. Also, significant differences are found in menstrual practices across different age groups (χ^2=15.440, p=0.001). Girls aged 14 years exhibit the highest mean score (266.68), followed by those aged 15 years, while 13-year-olds have the lowest mean score. These findings highlight the influence of various personal details such as class, social status, religion, and age on menstrual practices among school going girls.

1.5.Menstrual Practices among school going girls and with their family details.

Variables	Class	N (480)	Mean	Statistical Values
Father Educational Status	Illiterate	85	196.45	χ^2=25.682 *df*=4 P=.000***
	Primary	69	216.93	
	secondary	69	223.26	
	Higher Secondary	139	251.73	
	College	118	282.86	
Father Occupation	Cooli	73	228.55	χ^2=14.515 *df*=6 P=.024*
	Farmer	160	214.46	
	Self Employee	34	253.57	
	Private Employee	47	284.06	
	Government Employee	72	255.24	
	Business	60	252.02	
	Others	34	263.87	

1.5.a. Menstrual Practices among school going girls and with their family details.

Mother Education	Illiterate	128	221.22	χ^2=24.300 *df*=4 P=.000***
	Primary	77	191.52	
	secondary	69	253.12	
	Higher Secondary	137	277.11	
	College	69	245.63	
Mother Occupation	Housewife	297	253.68	χ^2=27.859 *df*=5
	Self-Employee	26	178.96	

	Private Employee	36	305.92	P=.000***
	Government Employee	20	219.40	
	Business	19	197.68	
	Others	82	198.64	
No of Family members	1-4 Members	207	241.14	χ^2=.721 *df*=3 P=.868@
	5-6 Members	188	244.40	
	7-9 Members	59	232.58	
	Above 9 Members	26	225.21	
Type of House	Kutch	25	213.28	χ^2=4.098 *df*=2 P=.129@
	Semi-Pucca	93	220.75	
	Pucca	362	247.45	
Family Income	Below 50000	201	233.82	χ^2=1.840 *df*=3 P=.606@
	50001 - 100000	157	243.58	
	100001 to 150000	74	238.32	
	Above 150001	48	261.74	
Birth Order	First	287	248.47	χ^2=3.059 *df*= 2 P=.217@
	Second	145	224.80	
	Third	48	240.29	

Significance Level: p<0.00*, p<0.01**, p<0.05*, @=No significance**

The table no 1.5 examination of menstrual practices among school going girls in correlation with various family details unveils important insights into the factors influencing menstrual health in adolescent girls. There is a significant difference in menstrual practices based on father's educational status (χ^2=25.682, p<0.001) underscores the potential influence of paternal education on menstrual practices. Girls with fathers educated up to Higher Secondary or College levels tend to exhibit higher mean scores. This suggests that fathers with higher education levels may contribute to a more informed environment regarding menstrual health within the household, potentially leading to better practices among their daughters. With regarding father's occupation, the observed significant differences in menstrual practices based on father's occupation (χ^2=14.515, p=0.024) highlight the role of paternal employment in shaping menstrual health behaviors. Girls with fathers in Private or Government employment demonstrate higher mean scores, possibly due to increased access to resources, education, and awareness about menstrual health compared to those with fathers in occupations like Cooli or Farmer. Regarding mother education, a significant difference in menstrual practices based on mother's education level (χ^2=24.300, p=0.001) suggests the influence of maternal education on menstrual health practices. Girls with mothers educated up to Higher Secondary or College levels exhibit higher mean scores, indicating that maternal education plays a crucial role in promoting informed menstrual practices among daughters. Similarly, the significant differences in menstrual practices based on mother's occupation χ^2=27.859, p=0.001) emphasize the impact of maternal employment on menstrual health behaviors. Girls with mothers in Private Employee occupations demonstrate the highest mean scores, possibly due to factors such as increased exposure to information, financial stability, and better access to healthcare resources.

However, the absence of significant differences in menstrual practices based on these factors suggests that while they may influence other aspects of family dynamics (Number of Family Members, Type of House, Family Income, and Birth Order); they do not directly impact menstrual health behaviors among school going girls. These findings underscore the multifaceted nature of influences on menstrual practices among adolescent girls. Addressing socio-economic factors, parental education, and maternal employment status is crucial in designing effective menstrual health education programs aimed at promoting healthy menstrual practices and addressing disparities among school going girls.

Discussion:

The findings from the reviewed studies and results of the present provide valuable insights into the knowledge, attitudes, and practices related to menstrual hygiene management (MHM) among adolescent girls in various settings. Across different regions and countries, several common themes emerge, highlighting the challenges and disparities faced by girls in managing menstruation.

One recurring theme is the significant lack of comprehensive knowledge about menstruation among adolescent girls, particularly in low- and middle-income countries (LMICs). Many girls lack accurate information about menstrual physiology, hygiene practices, and the use of menstrual hygiene products. This lack of knowledge often leads to misconceptions, unhygienic practices, and negative health outcomes. Additionally, cultural taboos and social norms surrounding menstruation further exacerbate these challenges, hindering open discussions and access to essential menstrual health resources.

Educational interventions play a crucial role in addressing these challenges by improving awareness, dispelling myths, and promoting safe MHM practices. Studies such as those by Kaur et al. (2018) and Majeed et al. (2022) emphasize the effectiveness of educational programs in enhancing menstrual knowledge and reducing stigma associated with menstruation. These interventions not only provide girls with accurate information but also empower them to manage their menstrual health with confidence and dignity.

Furthermore, the influence of socio-economic factors on menstrual knowledge and practices cannot be overstated. Studies by Shumie and Mengie (2022) and Nwimo et al. (2022) highlight the disparities in MHM practices based on factors such as household income, parental education, and access to menstrual hygiene products. Girls from disadvantaged backgrounds often face greater challenges in accessing essential resources and may resort to unhygienic practices due to limited knowledge and resources.

Interestingly, while family dynamics such as parental education and occupation play a role in shaping menstrual knowledge and practices, the findings suggest that other factors beyond family influence also contribute significantly. For instance, the study by Mansoor et al. (2020) found that despite variations in parental education

and occupation, there were consistent awareness levels across different age groups, indicating equitable knowledge distribution regardless of family background.

Conclusion:

The findings from the reviewed studies and the present study underscore the urgent need for comprehensive educational interventions, awareness creation programs, and community engagement initiatives to enhance menstrual hygiene management among adolescent girls, particularly in LMICs. The significant lack of comprehensive knowledge about menstruation, coupled with socio-cultural taboos and economic disparities, continues to pose challenges for girls in managing their menstrual health effectively. Educational interventions have shown promise in improving awareness, dispelling myths, and promoting safe MHM practices, highlighting the importance of empowering girls with accurate information and resources.

Addressing disparities in access to menstrual hygiene products and promoting gender-sensitive policies are essential steps towards achieving menstrual equity and promoting the well-being of adolescent girls worldwide. While family dynamics such as parental education and occupation play a role in shaping menstrual knowledge and practices, other factors beyond family influence also contribute significantly, suggesting the need for multifaceted interventions.

Limitations of the study:

Despite the valuable insights provided by this study, several limitations must be acknowledged. Firstly, the study's cross-sectional design limits the ability to establish causal relationships between socio-economic factors and menstrual knowledge and practices. Longitudinal studies would provide a more comprehensive understanding of how these factors evolve over time and their impact on menstrual health outcomes.

Additionally, the study's reliance on self-reported data may introduce response bias, as participants may provide socially desirable responses or underreport sensitive information. Future research could utilize objective measures or mixed method approaches to validate self-reported data and provide a more nuanced understanding of menstrual hygiene practices.

Furthermore, the study's focus on a specific region (Andhra Pradesh, India) may limit the generalizability of the findings to other geographical contexts. Replication of the study in diverse settings would enhance the external validity of the findings and facilitate cross-cultural comparisons.

Further Directions:

Future research should explore innovative approaches to addressing the socio-cultural, economic, and environmental determinants of menstrual hygiene management among adolescent girls. This could include

community-based interventions, peer education programs, and collaborations with local stakeholders to develop culturally sensitive and context-specific initiatives.

Moreover, longitudinal studies tracking girls' menstrual health outcomes over time would provide valuable insights into the long-term impacts of educational interventions and socio-economic factors on menstrual hygiene practices and reproductive health outcomes.

Additionally, there is a need for policy-level interventions to ensure access to menstrual hygiene products, improve menstrual health education in schools, and destigmatize menstruation in society. Advocacy efforts should aim to mainstream menstrual health within broader public health agendas and mobilize resources to support comprehensive MHM programs.

Overall, addressing the challenges in menstrual hygiene management requires a multi-sectoral approach involving governments, non-governmental organizations, civil society, and communities. By prioritizing menstrual health as a fundamental human right, we can empower adolescent girls to manage their menstrual health with dignity, promote gender equity, and improve overall health and well-being.

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