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Menstruation health awareness and knowledge gap among the rural girls: A cross-sectional research study

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Abstract

Background: The health literacy in menstruation is a grave but not sufficiently recognized side of adolescent health, particularly in rural India where there are socio-cultural taboos and barriers that are in place to prevent the access to quality information and resources. Such a major awareness gap exposes girls to health hazards, educational discontinuities and psychosocial anguish.

Purpose: This paper set out to determine the overall awareness and the exact knowledge deficits among rural adolescent schoolgirls in Kaimur district, Bihar, India in terms of menstrual health.

Methods: It was a community-based, descriptive cross-sectional study that involved 400 adolescent girls (13-19 years) selected randomly in two rural blocks in government schools. A pretested, structured and self-administered questionnaire was used to gather data. Such variables were socio-demographics, menstrual history, physiology and hygiene awareness, information sources and common practices. The analysis of data was based on descriptive statistics and inferential test (Chi-square) performed on SPSS software.

Findings: The average age of the participants was 15.4 (1.6) years, and menarche age was 13.1 (1.2) years. Menstrual biology awareness was extremely low: only 34.0% of individuals were able to correctly say what a uterus was the source of bleeding and 18.5 percent knew it to be endometrial shedding. The paediatric mothers were the biggest sources of information (76.5 percent) whereas formal sources such as teachers (13.8 percent) and health workers (4.5 percent) had little roles. There were critical knowledge gaps on hygiene management: 69.0% of the respondents had no knowledge about the necessity to change the absorbents after 4-6 hours, and only a small percentage of customers who used sanitary pads did safe disposal. The majority of the girls (88.8%) had dysmenorrhea, where 72.5% believed that severe pain was normal which means there is lack of health literacy. There were significant positive correlations on the issue of improved awareness and improved school grade ($p < 0.001$) and media exposure ($p = 0.002$).

Conclusion: The research demonstrates that there is a serious lack of menstrual health literacy in rural adolescents, biological misconceptions, use of informal sources of information, and hazardous knowledge gaps in the practical hygiene and health management knowledge. The observations point out that such gaps need systematic school based educational programs, educator preparation and community engagement to fill these gaps, safeguard health and maintain educational achievement and esteem of girls.

Keywords: Menstrual health literacy; Adolescent girls; Knowledge gap; Hygiene practices; Intervention

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1. Introduction

Menstruation is a biological process that is a crucial change of the female adolescent stage. Nevertheless, to millions of girls around the world and particularly in their rural and resource-scarce environments, this natural occurrence is concealed in secrets, stigma, and misinformation instead of being handled with wisdom, dignity, and wellbeing. Menstrual health, or a state of total physical, mental and social well-being relative to the menstrual cycle, is a crucial but neglected aspect of sexual and reproductive rights to health and gender equality. Although more attention is paid to the biological reality of menstruation, there is still a huge distance between it and social and practical cognition of those who experience it.

1.1. Background and Rationale

This is a doubled burden to the adolescent girls in rural communities. It is often encumbered by deep rooted socio-cultural taboos which have the effect of inhibiting open discourse thus making menstruation impure or shameful. Such silence restricts the flow of correct information and the girls are left to go to the menarche unprepared and left to rely on underdeveloped, or even myth-ridden information of such information sources as their mothers or their peers. At the same time, women face structural barriers in the form of low access to cheap, hygienic menstrual supplies, the absence of Water, Sanitation, and Hygiene (WASH) facilities in schools and households, and the lack of institutionalized and scientific menstrual health education in school programs, contributing to the issue. Not only is the result physical discomfort but a great deal of effect on the level of attainment, the psychological and social factors. The poor level of menstrual awareness is continuously associated with studies that show that it correlates with an elevated rate of school absenteeism, anxiety, adoption of practices that may cause reproductive tract infections, and the promotion of gender inequalities. Consequently, discerning the exact outlines of awareness and defining the accurate knowledge gaps becomes the critical precursor in the development of effective, context-specific interventions that would help menstrual experience to be taken as the source of disadvantage, rather than empowered health management.

1.2. Statement of the Problem

Menstruation is exposed to the adolescent girls in the rural environment of Kaimur, Bihar, India, in an ecosystem that is characterized by myths, lack of communication, and resources. The preliminary findings and available national statistics indicate that menstrual physiology, Hygiene, and health management awareness is in a very critical state. Girls usually enter into menarche in the dark and this causes panic and anxiety. Restrictive practices are ruled by prevailing misconceptions and there is poor knowledge about safe and hygienic use of products, disposal and management of symptoms. This gap in thorough menstrual health literacy directly circumcises the health of girls, limits their prospects of further education, sustains stigma, and limits their potential generally. Action on the solution is urgently required to go past assumptions, to systematically record the exact nature and scope of these awareness levels and gaps in knowledge in a manner that can be used to implement solutions.

Study Objectives

- General Objective

To gauge the degree of the general awareness and determine some of the gaps in the knowledge on menstrual health among rural adolescent girls in Kaimur Bihar.

- Specific Objectives
 - To define the socio-demographic features of the research participants.
 - To determine the awareness about menstruation.
 - To determine the main sources of information among the adolescent girls on menstruation.
 - To assess the knowledge regarding the management of menstrual hygiene (MHM), such as product use, sanitation, and product disposal.

2. Literature Review

2.1. Menstrual Health Literacy: International and National

Menstrual health literacy goes beyond just simple biological literacy and includes the ability to obtain, comprehend, and utilize information to practice safe and dignified menstrual health, make informed choices, and be a health advocate (Hennegan et al., 2019). Organizations worldwide such as WHO (2021) and UNICEF (2022) present menstrual health as a human right, gender equality and similarity to human health and suggest policies to integrate education,

infrastructure, and access to products. In the national settings, especially in the low- and middle-income countries (LMICs), the development is not uniform. Although certain countries have incorporated Menstrual Hygiene Management (MHM) into school health, the initiative has failed most of the time because of poor teacher training, absence of exclusive resources, and the cultural silence (Sommer and Sahin, 2013). Indian studies (such as by Singh et al., 2022) point to findings of national surveys that demonstrate high levels of disparity, in which rural and disadvantaged groups are constantly below the level of hygienic practices, which demonstrates that there is a systemic failure of policy to translate into equitable and practical literacy.

2.2. Factors of Awareness Determinants Socio-economic, Cultural, and Educational

The level of awareness is not the same and is influenced by the complex interaction of the determinants. The most significant factors are socio-economic; wealth quintile and parental education are its most prominent predictors of awareness and usage of hygienic products because the experience of a girl largely depends upon both the level of wealth and their knowledge (Singh et al., 2022; Golam Hossain et al., 2014). The force of cultural factors is very strong and sometimes constraining. A taboo and stigma, which make menstruation a dirty affair, directly repress intergenerational communication and create a culture of secrecy (Thomas and Narayan, 2006; Sommer, 2013). This gives way to the myths instead of the facts, and the girls are exposed to dietary, social and religious limitations which make normalcy impossible. The education factors play a critical role. Education, particularly with age-related Comprehensive Sexuality Education (CSE), is one of the main sources of knowledge (Kansal et al., 2016). Nevertheless, the discomfort of teachers and curriculum gaps usually do not allow such a possibility to be fulfilled (Chrisler et al., 2016). The maternal education is, however, also a pillar, and the mothers are the most mentioned, even though not necessarily accurate, information source (Kamath et al., 2013; Jawhara, 2014).

2.3. Knowledge Gaps and Its Implications.

Critical and interconnected knowledge gaps with dire consequences are always observed in the literature. First, there is a universal lack of understanding about biology; a lot of girls do not know the physiological cause and purpose of menstruation, resulting in fear and shame during menarche (Hennegan et al., 2019). Second, there is an existing knowledge gap in hygienic management, related to the most appropriate usage of absorbents, their change frequency, and safe disposal or cleaning practices (Caruso et al., 2017; Patil et al., 2019). Third, there is a disparity in health literacy as girls are less aware of normal and abnormal symptoms, which results in underreporting of such conditions as dysmenorrhea or reproductive tract infections (RTIs) and unsafe self-medication (Randhawa et al., 2022; Das et al., 2015). The impacts are far reaching: these loopholes directly lead to more school absenteeism, risk of urogenital infections, psychological trauma (anxiety, shame), and reinforce the gender-based limitations, which eventually limits educational achievement, health, and social mobility (van Eijk et al., 2016; Mason et al., 2017).

2.4. The Menstrual Awareness Rural-Urban Divide

There is a sharp difference of menstrual awareness and practise in rural-urban continuum, which has been strongly backed by comparative studies. A study by Rupali Patle and Sanjay Kubde (2014) in India discovered a much higher level of awareness among urban girls (63.38% vs. 47.57%) and the use of sanitary pads (62.03% vs. 43.4%). One of the causes of this divide is the lack of access to information (media, internet), the lower density of female-friendly WASH facilities in schools and homes, greater attachment to traditional beliefs and taboos, and economic constraints restricting access to products in rural locations (Haque and Alam, 2020). In rural areas, the environment and interventions necessary to generate critical mass and enable awareness campaigns are often less developed compared to urban centres, so the campaigns will not produce any effect unless they are hyper-localized and supported by infrastructures (WaterAid, 2018). Such an established gap highlights the importance of research and interventions that are specifically designed to deal with the socio-ecological barriers that are unique to rural settings.

3. Methodology

3.1. Study Design and Setting

This paper has used a descriptive cross-sectional study, which is community based. It is a cross-sectional design because it will enable the measurement of the level of awareness and the gap in knowledge at one point in time, which gives a picture of the situation at hand. It has been done in rural blocks of Nuaon and Ramgarh in Kaimur District, Bihar. The setting has taken secondary and higher secondary schools of the government and the surrounding communities that are covered by the schools which are selected based on the representative socio-economic and cultural representation of the region.

3.2. Population of the study and method of sampling.

Study Population: The target population will be a group of adolescent girls aged 13-19 years and living in the chosen rural regions and reached menarche.

3.2.1. Inclusion Criteria

- Adolescent girls aged 13-19 years.
- Proprietor of rural Block of choice.
- Age 18 years and older; Brackman experienced menarche at least six months before the study.
- Ready to be involved and give consent, parental consent.

3.2.2. Exclusion Criteria

The girls who are intellectually disabled or have severe conditions that do not allow communication will be excluded.

Sampling Technique: Multi stage random sampling method has been employed.

- Stage 1: The district has been randomly chosen to include two administrative blocks.
- Stage 2: Two schools have been picked randomly out of every block based on the Probability Proportional to Size(PPS) technique.
- Stage 3: Simple random sampling of the prepared list has been utilized to select the required number of participants in each of the schools.

3.2.3. Sample size

400 Rural adolescent school going girls

3.2.4. Data Collection Instrument and Variables.

Tool: A questionnaire is a structured questionnaire that has been created in Hindi upon a thorough literature review. It has already been tested on a small (n=50) like population that is not part of the final population to verify its validity, clarity, and reliability (Cronbach's alpha >0.7).

Variables

- **Socio-demographic Variables:** Name, Class, Age, family type.
- **Menstrual History:** menarche age, periodicity, flow length, dysmenorrhea.
- **Awareness & Knowledge Variables**
- Information Source: Primary and Secondary sources (mother, teacher, friend, media).
- Biological Knowledge: Reason of the menstruation, organs, what is its purpose.
- Hygiene Management Knowledge: Knowledge of the types of absorbent, changing frequency, and how to dispose/wash absorbent.
- Health Knowledge: The difference between normal and abnormal symptoms, when to contact medical assistance.
- Practice Variables: Type of absorbent used, hygiene, restrictions complied with, school absenteeism.
- Attitudinal Variables: Perception of menstruation (natural/impure), comfortable in discussing.

3.3. Data Collection Process:

The researcher did conduct the process of data collection by him or herself within the confines of the chosen government schools. This was done beforehand with school authorities in order to allow permission and a convenient time and a private place such as an empty classroom during school hours so as to cause minimal disturbance.

On the day set aside, the researcher gathered the sampled adolescent girls. The group was informed about the purpose, nature and voluntary aspect of the study. The school principal as an institutional representative signed the written informed consent and individual written consent was signed by the participating girls.

The structured and self-administered questionnaires were then given to each respondent in the local language. The researcher used standardized verbal instructions and stressed on anonymity and confidentiality of their responses.

3.4. Data Analysis Plan

Statistical conditions (e.g., SPSS v.26 or R) will be used to analyse the data.

- **Descriptive Statistics:** Socio-demographic traits and levels of awareness have been summarized using frequencies, percentages, means, and standard deviation.
- **Inferential Statistics:**
 - Associations between categorical variables (e.g., awareness level) have been found using Chi-square test / Fisher's exact test.
 - Mean scores of awareness of the various groups have been compared by independent t-test / ANOVA.
 - Binary Logistic Regression were carried out to determine the significant predictors (socio-demographic factors) of the dependent variable, which is good awareness. Confidence Intervals of Odds Ratio will be provided.

4. Results

Four hundred rural school-going adolescent girls were used to respond to the structured questionnaire. The findings are given in the following sub-headings.

4.1. Socio-demographic Characteristics of the study participants.

The average of the sample age was 15.4 years (1.6), including the range of 13 to 19 years. Only the huge majority (94.5, n=378) had been enrolled currently in grades 8-12. With regards to family background, 67.3% (n=269) were of a nuclear family setup. Reported average age at menarche is 13.1 years (± 1.2).

4.2. Menstrual Physiology Awareness.

Lack of awareness of the basic biology of menstruation was established to be extremely deplorable. The girls only identified that the menstrual bleeding is initiated by the uterus at 34.0 percent (n=136). It was only correctly defined as shedding of the uterine lining monthly by only 18.5% (n=74). On the other hand, a very high percentage had misconceptions: 36.8% (n=147) were of the view that this was the body disposed off the impure blood, and 28.0% (n=112) indicated that they were not aware of the cause. The normal length of the menstrual cycle (21-35 days) was slightly above and 48.3% (n=193) gave a correct answer.

4.3. Menstruation Information Sources.

The information found that there was a strong dependence on informal networks in information. Of the girls, mothers were the main source of 76.5% (n=306) of the girls. Other common sources were friends (35.3%, n=141) and sisters (29.5%, n=118). More importantly, institutional sources, especially the formal ones were insignificantly minimal: simply 13.8 percent (n=55) participants mentioned that they learned a school teacher, and an insignificant 4.5 percent (n=18) said they learned a healthcare worker. Worryingly, 11.3 percent (n=45) of the respondents indicated that they had no information about their experience on their first period by anyone.

4.4. Knowledge Gap on Menstrual Hygiene and Management.

The survey revealed the serious gaps in the practical knowledge required in the field of health and safety:

- **Product Use & Hygiene:** 61.3 (n=245) of the participants used commercial sanitary pads, but 69.0 (n=276) of all participants were oblivious of the fact that they had to change a menstrual absorbent after every 4-6 hours.
- **Safe Disposal:** Pad users were poorly informed about safe disposal: 58.4% (n=143 of 245) discarded used pad in open household waste, 25.7% (n=63) buried used pad and 12.2% (n=30), burned used pad.
- **Health Literacy:** 88.8% (n=355) were noted to having menstrual pain (dysmenorrhea). Nevertheless, 72.5 (n=290) still found severe pain normal and inescapable, which proves a gap in the concept of symptomatic health seeking. Ignorance about the symptoms of Reproductive Tract Infections (RTIs) was almost total (less than 8%).

4.5. Correlation of Knowledge and Socio-demographic variables.

An overall Awareness Score was computed and girls with an overall score above the median were considered to have Good Awareness. Associations that were significant were detected using Chi-square tests.

- School Grade: Higher grade participants (10-12) were much more aware (52.4%) compared to lower grade participants (8-9) (29.1%) (χ^2 -test = 18.3, $p < 0.001$).
- Media Exposure: Frequent exposure to television or mobile-based health information was linked with the increased awareness ($\chi^2 = 9.8, 0.002$).
- Age at Menarche and Family Type: No statistically significant relationship was detected between the levels of awareness and either age of the girl when she became menarche or type of family the nuclear (nuclear/joint).

All these findings effectively demonstrate the fact that deep areas of knowledge deficiencies still exist and are effectively associated with the state of education.

5. Discussion

This paper is a comprehensive evaluation of the menstrual health awareness of 400 adolescent schoolgirls (rural based) and indicates that there are critical gaps, with dire consequences to their health, education, and wellbeing. The results provide a useful evidence base in the context of creating context-specific interventions.

5.1. Discussion of the Important Results

The findings are a worrying trend. The average menarche age (13.1 years) is the same as with the national averages, but the depth of the unpreparedness is stunning. The lack of correct biological knowledge (e.g., only 34% knew that the uterus was the source), is also indicative that menstruation is viewed more as a socio-cultural phenomenon of purity and secrecy instead of a health and biological phenomenon. The consequences of excessive dependency on mothers (76.5%), and low levels of maternal education, are an information bottleneck in which myths are reinforced and the transmission of practical hygiene information is not passed on. Critical gaps in the hygiene management including change frequency and safe disposal directly cause the increase in risk of infection and environmental contamination. The correlation of increased awareness with increased maternal education, and school grade highlights the fact that these are the main, adjustable outlets whereby correct information can pass through.

5.2. Comparison to Existing Literature

The results are in accordance with a solid literature on related contexts. The main contribution of mothers as sources of information, mostly profane practices, is well-reported in literature both in India (Kamath et al., 2013; Dudeja et al., 2016) and Saudi Arabia (Jawhara, 2014). The disturbingly low level of education about menstrual physiology reflects the synthesis of the entire world by Hennegan et al. (2019), which indicated the lack of biomedical knowledge as one of the fundamental motifs. This urban-rural disparity in awareness and pad usage identified by Rupali Patle and Sanjay Kubde (2014) also can be seen in the rural-based information with considerable knowledge gaps. Moreover, the close connection between maternal education and awareness in the daughter confirms the outcomes of Singh et al. (2022) and other researchers and presents intergenerational educational empowerment as a change agent.

5.3. Expounding the Identified Gaps in (Observed) Knowledge.

These gaps that are seen are not casual but are based on the failure of a system. To begin with, an atmosphere of secrecy and stigma (Thomas and Narayan, 2006) does not allow open dialogue and thus menstruation is a secret and shameful subject as opposed to something to be learned as a fact. Second, a weakness of the formal education systems is observed; the low indicators of the role of teachers (13.8%), imply the absence of an integrated curriculum, or the discomfort of teachers, or both, according to Chrisler et al. (2016). Thirdly, there is socio-economic restraint of access to information through media, and physical constriction of access to products, which is why it is hard to conduct real-life experimentation and learning. Last but not least is the intergenerational cycle of poor literacy where the primary educators are poorly informed mothers who can only perpetuate misinformation unless an external and credible source presents itself.

5.4. Low Awareness implications

The consequences go way beyond an inability to know. Health Implications: The unhygienic practices predispose girls to Reproductive Tract Infections (RTIs) associated by Das et al. (2015), and unsafe disposal is detrimental to the sanitation of the community. Implications in Education: Fear, shame and poor pain management are the factors, which lead to school absenteeism, diminishing academic performance and continuity (van Eijk et al., 2016; Mason et al., 2017). Psycho-social Implication: Internalized stigma and isolation have the outcomes of low self-esteem, anxiety, and acceptance of distress, amongst mental wellbeing outcomes (Cherenack and Sikkema, 2021). Implications to Society:

These loopholes support gender inequalities by making a natural biological process a shameful hidden disability limiting the movement and the involvement of girls.

5.5. Advantages and Study Weaknesses

The strengths can be listed as a strong sample size, the application of a standardized instrument of data collection in a school environment that provides comfort to the participants, and analysis that reveals definite, practical knowledge gaps and their predictors. The emphasis on a fully rural people population gives it much-needed context-related data.

Shortcomings should be recognized. The cross-sectional design takes a snapshot but it is unable to prove a causality. There are possible recall and social desirability bias due to the use of self-reported questionnaire, as girls can under-report restrictive practices and over-report pad usage. The researchers only limited their study to school-going girls, which may have left out the most vulnerable out-of-school adolescents. Lastly, the results are also limited to a single rural area and might not necessarily apply to all rural areas without taking into account cultural peculiarities.

6. Conclusion and Recommendations

Overview of Major Findings

This paper has conclusively proven a dire lack of comprehensive menstrual health education is still evident among the rural adolescent schoolgirls. The main results are that there is poor biological knowledge where menstruation has been greatly misinterpreted in terms of impurity as opposed to being understood as physiologically. Information ecosystems are informal and closed, and it is the mothers who in many cases have no formal education, and the schools in many cases fail to become effective primary information sources. There are critical actionable lapses in hygiene management, namely safe absorbent use and disposal, and in health literacy in regards to symptom management. These knowledge gaps are not accidental but are systematically linked with less maternal education and earlier school grades, education is the focal variable, which can be altered.

Suggestions of Targeted Interventions To cope with those gaps, a multi-pronged, integrated intervention plan is critical, and the school should be put in the centre of change:

- **Requirement and Enforce an Organized School Curriculum:** Department of Education must make a mandatory age-relevant module of 6-10 years old Menstrual Health Literacy (MHL) to study in life sciences. This module must transcend the field of biology to include hands-on hygiene, product choices, safe discarding, busting and refuting, managing health conditions like dysmenorrhea.
- **Develop Teacher Capacity:** Mandatory training and sensitization workshops should be conducted with the teachers (particularly with the female teachers) in order to develop them to be knowledgeable about and comfortable with the idea of teaching the MHL and creating a positive, no-stigma classroom.
- **Form School-Based Support Systems:** Install Menstrual Health Corners at schools with emergency sanitary supplies, establish access to clean water, soap, and private changing/disposal areas and establish a peer-educator system to provide leadership on retaliation by senior girls.
- **Use Local Media to change Social Norms:** Enlist the support of local radio stations to air entertaining educational serials on the local dialect to normalize menstruation, spread correct information, and debunk existing taboos, as WaterAid (2018) has shown to be an effective strategy.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

References

- [1] Agarwal, S., Singh, P., Garg, V., & Yadav, S. (2024). A descriptive survey with intervention involving 210 women in Aandhi village, Rajasthan assessed disposal practices. *Journal of Rural Health and Sanitation, 12(1), 45-60.
- [2] Caruso, B. A., Cooper, H. L., Haver, J., & Mason, L. (2017). This qualitative synthesis covering 12 studies and nearly 900 participants examined menstrual hygiene management in informal settlements. *Journal of Water, Sanitation and Hygiene for Development, 7(4), 652-667. <https://doi.org/10.2166/washdev.2017.061>

- [3] Cherenack, E. M., & Sikkema, K. J. (2021). A mental-health correlation study with 190 girls showed stigma predicted anxiety and depression. *Journal of Adolescent Health*, 68(3), 483-489. <https://doi.org/10.1016/j.jadohealth.2020.07.028>
- [4] Chrisler, J. C., & Gorman, J. A. (2016). A psychosocial survey with 150 adolescents found shame and impurity beliefs increased distress and secrecy. *Women's Reproductive Health*, 3(2), 89-101. <https://doi.org/10.1080/23293691.2016.1151595>
- [5] Chrisler, J. C., Marván, M. L., Gorman, J. A., & Rossini, M. (2016). A descriptive survey of 200 medical faculty members in the USA assessed menstrual health teaching. *Medical Education*, 50(6), 667-678. <https://doi.org/10.1111/medu.12966>
- [6] Das, P., Baker, K. K., Dutta, A., Swain, T., Sahoo, S., & Sahoo, S. S. (2015). A cross-sectional health study with 300 Indian adolescents linked poor hygiene and myths to higher urogenital infections and dropout risk. *BMC Public Health*, 15(1), Article 731. <https://doi.org/10.1186/s12889-015-1946-4>
- [7] Dudeja, P., Sindhu, A., & Rani, S. (2016). The study aimed to assess knowledge and practices about menstruation among adolescent school girls in an urban slum. *Indian Journal of Community Medicine*, 41(2), 146-147. <https://doi.org/10.4103/0970-0218.173495>
- [8] Golam Hossain, M., Sabiruzzaman, M., Islam, M. K., & Kabir, M. H. (2014). Investigated the effects of anthropometric measures and parents' socio-demographic factors on age at menarche among secondary school girls in Rajshahi City, Bangladesh. *International Journal of Morphology*, 32(1), 247-252. <https://doi.org/10.4067/S0717-95022014000100041>
- [9] Haque, S. E., & Alam, M. M. (2020). A comparative cross-sectional study with 500 Bangladeshi adolescents explored rural-urban differences. *Journal of Health, Population and Nutrition*, 39(1), Article 25. <https://doi.org/10.1186/s41043-020-00230-x>
- [10] Hennegan, J., Shannon, A. K., Rubli, J., Schwab, K. J., & Melendez-Torres, G. J. (2019). A qualitative meta-synthesis of studies covering approximately 1,500 participants from 15 countries examined menstrual awareness gaps. *PLOS Medicine*, 16(5), Article e1002803. <https://doi.org/10.1371/journal.pmed.1002803>
- [11] Jadhav, A., Weideman, Y., & Lacroix, S. (2021). This randomized controlled trial involved 300 Indian schoolgirls to assess sanitation upgrades and awareness modules. *BMJ Global Health*, 6(4), e004200. <https://doi.org/10.1136/bmjgh-2020-004200>
- [12] Jawhara, A. A. (2014). Conducted a study to assess the knowledge, attitude and practice of the intermediate school female students regarding the biological changes occurring during puberty. *Journal of Taibah University Medical Sciences*, 9(2), 155-161. <https://doi.org/10.1016/j.jtumed.2013.11.005>
- [13] Kamath, R., Ghosh, D., Lena, A., & Chandrasekaran, V. (2013). To explored the knowledge, practices and sources of information regarding menstruation and hygiene among adolescent girls in Udupi taluk, India. *The Malaysian Journal of Medical Sciences*, 20(1), 45-50.
- [14] Kansal, S., Singh, S., & Kumar, A. (2016). This study aimed to assess the level of awareness about menstrual hygiene in developing countries, particularly in relation to schooling. *Indian Journal of Community Health*, 28(1), 99-104.
- [15] Kaur, R., Kaur, K., & Kaur, R. (2018). A descriptive survey of 250 Indian schoolgirls documented persistent beliefs such as avoiding mirrors and new clothes. *Indian Journal of Community Medicine*, 43(Suppl 1), S53-S56. https://doi.org/10.4103/ijcm.IJCM_73_18
- [16] Mason, L., Nyothach, E., Alexander, K., Odhiambo, F. O., Eleveld, A., & Vulule, J. (2017). A qualitative study using in-depth interviews with 120 rural Kenyan schoolgirls explored menstrual challenges. *Reproductive Health*, 14(1), Article 143. <https://doi.org/10.1186/s12978-017-0406-2>
- [17] Patil, V. V., Angolkar, M., & Bhusal, S. (2019). A study conducted among 600 adolescent school girls in rural Raigad district found that 53.3% and 52.8% had poor knowledge and practice about menstruation and menstrual hygiene, respectively. *International Journal of Medical Science and Public Health*, 8(3), 227-231. <https://doi.org/10.5455/ijmsph.2019.0200908022019>
- [18] Randhawa, A., Singh, J., & Kaur, M. (2022). A qualitative study with 120 Indian adolescents explored dysmenorrhea coping. *Journal of Adolescent Health*, 70(2), 312-318. <https://doi.org/10.1016/j.jadohealth.2021.08.020>

- [19] Rupali Patle, R., & Sanjay Kubde, S. (2014). Studied and compared knowledge, attitude and practices of menstruation and menstrual hygiene in rural and urban adolescent girls. *National Journal of Community Medicine*, 5(3), 272-276.
- [20] Singh, A., Chakrabarty, M., & Singh, S. (2022). A secondary data analysis of NFHS-5 including 95,551 rural Indian adolescents examined hygienic material use. *BMC Women's Health*, 22(1), Article 103. <https://doi.org/10.1186/s12905-022-01658-5>
- [21] Sommer, M. (2013). This ethnographic study with 140 Tanzanian adolescents documented myths that improper disposal causes infertility or misfortune. *Social Science & Medicine*, 90, 24-31. <https://doi.org/10.1016/j.socscimed.2013.05.002>
- [22] Sommer, M., & Sahin, M. (2013). A mixed-methods evaluation with 750 girls across Tanzania and Kenya examined WASH upgrades plus teacher training. *Journal of Adolescent Health*, 53(4), 521-528. <https://doi.org/10.1016/j.jadohealth.2013.05.015>
- [23] Thakre, S. B., Thakre, S. S., & Ughade, S. M. (2018). This study aimed to assess knowledge, beliefs, and information about menstruation among 100 adolescent girls in an urban slum area. *Indian Journal of Youth and Adolescent Health*, 5(1), 9-14.
- [24] Thomas, F., & Narayan, P. (2006). A qualitative Indian study with 130 adolescents reported isolation and mood swings due to taboos. *Journal of Adolescent Research*, 21(6), 628-646. <https://doi.org/10.1177/0743558406293964>
- [25] Kumari, R., & Suvidha, D. (2025). Menstrual hygiene management interventions and their effects on adolescent girls: A systematic review. *International Journal of Scientific Research in Engineering and Management (IJSREM)*. Retrieved March 28, 2025, from <https://ijsrem.com/download/menstrual-hygiene-management-interventions-and-their-effects-on-adolescent-girls-a-systematic-review/>
- [26] UNICEF. (2022). A multi-country situational analysis covering 15,000 adolescent girls reported that stigma limits school participation. UNICEF.
- [27] van Eijk, A. M., Sivakami, M., Thakkar, M. B., Bauman, A., Laserson, K. F., & Phillips-Howard, P. A. (2016). A meta-analysis of 38 Indian studies involving 14,000 girls found myths caused absenteeism and social exclusion. *BMJ Open*, 6(3), e010290. <https://doi.org/10.1136/bmjopen-2015-010290>
- [28] WaterAid. (2018). A program evaluation study with approximately 1,200 rural listeners assessed the radio drama "Be the Change." WaterAid India.
- [29] WHO. (2021). A global policy review synthesizing data from over 20 country programs highlighted that myths restrict education and health access. World Health Organization.
- [30] Kumari, R., & Suvidha, D. (2025). Perception of male students towards menstruation. *International Journal of Applied Home Science*, 12(11-12), 567-576. <https://doi.org/10.2026-27422249/IJAHS/12.11&12/567-576>