

'Puberty to Womanhood' Module: An Interprofessional Approach to Reproductive Health Education Among Adolescent Schoolgirls

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ABSTRACT

INTRODUCTION: Adolescents in India lack knowledge of reproductive health and hygiene and often enter puberty completely unprepared. There is a growing need to incorporate programmes to educate schoolgirls to adopt healthy practices and attitudes towards reproductive health. **MATERIALS AND METHODS:** A validated 'Puberty to womanhood' module was prepared by an interprofessional team. A workshop for 402 adolescent girls was conducted on menstrual health and hygiene. MCQs consisting of questions about menstruation and hygienic menstrual practices were administered as a pre-test and two post-tests (immediately and three months post-workshop). Another questionnaire about menstrual health behaviour was also administered as a pre-test and three months post-workshop. Paired t-test and McNemar's test were used as appropriate, and $p < 0.05$ was considered statistically significant. **RESULTS:** Assessment of the module revealed significant improvement in knowledge of menstruation and hygienic menstrual practices immediately after the workshops ($p < 0.001$). There was a significant decrease in knowledge about menstruation three months post-workshop ($p < 0.001$), with no significant change in the test score of hygienic menstrual practices. A significant improvement in practices during menstruation ($p < 0.001$) was observed in participants who reported cleaning their genitalia at every visit to the toilet, using a single sanitary pad for more than 10 hours and disposing the used pads in dustbins ($p = 0.048$). **CONCLUSION:** The inclusion of the 'Puberty to womanhood' module enhanced and reinforced knowledge about menstruation and the appropriate hygienic practices during menstruation.

KEYWORDS: adolescent, adolescent health, interprofessional education, menstruation, reproductive health

INTRODUCTION

A detailed reproductive health education module at the school level is a necessity to address the health demands of adolescent girls in India.¹⁻³ Generally, the education sector in India considers it a personal matter to be addressed within the family.^{1,4} However, a structured programme covering the anatomy and physiology of the reproductive system, menstrual hygiene, and elimination of taboos associated with the reproductive system must be developed for improved reproductive health.^{4,5} This would result in the adoption of hygienic practices, a lower incidence of infections and thereby improve reproductive health in the country.⁶ The presence of health illiteracy among the youth highlights the importance of school-driven reproductive health and hygiene instructions.^{3,7,8}

For a new health education module, it is necessary to recognise, understand, and empathise not only with the lack of knowledge and myths associated with reproductive health, but also with the backgrounds of adolescent girls.^{9,10} A complete reproductive health module needs to be integrated into the school curriculum. The adoption of healthy practices and attitudes towards reproductive health is essential.¹¹ It is necessary to

go beyond the traditional concept of “*acquiring information from one’s mother*” and to reinforce health education to empower adolescent girls directly.¹²

A sex education module in schools is well within the scope of interprofessional collaborative practice, which emphasises community and population-oriented care. Constant interaction and learning between professionals to reflect on existing problems and develop practical solutions can go a long way.¹³ An interprofessional team, rather than working in silos, can effectively tackle issues of knowledge, attitude and behaviour related to community health and foster more equitable health outcomes for communities.¹⁴⁻¹⁶

In India, there is limited awareness of the impact of interprofessional practice, and many young girls step into puberty unprepared, surrounded by taboos and with limited knowledge of reproductive health, leading to incorrect attitudes and unhealthy practices.^{1,17-19} Therefore, various evaluations of reproductive health education interventions have advocated the importance of sex education and the need for an interprofessional approach to health education at the school level.^{8,19}

Studies assessing adolescent schoolgirls’ opinions on sexual health education modules have often provided insufficient information.²⁰ Retention of the knowledge and good practices has been a challenge hence innovative and customised strategies must be employed.^{17,21} These findings provided the foundation for this study. The aim of this study was to assess the effectiveness of the ‘Puberty to Womanhood’ module in relation to menstruation, hygienic practices, and the retention of knowledge related to these practices among adolescent schoolgirls.

MATERIALS AND METHODS

Participants and setting

Adolescents in this study were defined as girls between the ages of 12-16 years.²² The sample size was calculated using the equation: $n=4pq/d^2$, where p =prevalence, $q=1-p$ and d =level of precision. The prevalence was taken as the knowledge about menstruation among adolescent girls (36%) based on UNESCO data.¹ The sample size for this study was calculated as $n=400$. The convenience sampling technique was used to select the participants.

Participants who were within the age limit and provided written informed consent were included in this study. A total of 506 adolescent girls with a mean age of 14 years, studying in government schools in Mangalore taluk in Dakshina Kannada district of Karnataka, India participated in this educational intervention. 104 girls (20.5%) were lost to follow-up in this study. The study therefore included 402 (79.4%) adolescent schoolgirls who took part in the follow-up.

‘Puberty to Womanhood’ module

The educational approach used to impart knowledge to the adolescent girls in this study was the ‘Puberty to Womanhood’ module. This educational intervention consisted of several stages: i) planning, ii) implementation, iii) follow-up, iv) assessment, and v) evaluation.

Planning

An interprofessional team consisting of a physiologist, a gynaecologist, and a school biology teacher was formed to create 'Puberty to Womanhood' module using the UNESCO 'Puberty Education and Menstrual Hygiene Management Resource'.¹ Other members of the interprofessional team included school headmasters/headmistresses and adolescent schoolgirls.

The first step in planning the module was to specify the role of each team member. Clarity regarding the roles and responsibilities of each team member was fundamental to the planning process. The physiologist conducted team meetings and facilitated the implementation of the module. The gynaecologists reflected on the health concerns of adolescent girls, the healthcare facilities provided by the government, and provided expert inputs on the contents of the module. The school biology teachers reviewed the content of the biology curriculum, the mode of instruction, the attitude of the schoolgirls, the reproductive healthcare facilities provided by the government, the infrastructure of the school toilets, water availability in toilets, and health causes for dropout in schools. The integral stakeholders in the interprofessional team were the adolescent schoolgirls. Their inputs were instrumental in tailoring the module to maximise learning. They provided insights into their social, cultural, economic, and health status, as well as views on the usefulness of school biology lessons, knowledge of government facilities for reproductive healthcare, access to reproductive health care, and general attitudes towards reproductive health education. Based on the inputs from all interprofessional team members, the newly designed module contained sections on i) puberty, ii) menstruation, iii) clearing myths associated with menstruation, iv) hygienic menstrual practices, and v) safe disposal of used sanitary products. The module also guided the facilitators through each step of implementation.

Implementation

The 'Puberty to womanhood' module was implemented via a two-hour workshop facilitated by two facilitators. Figure 1 shows the flow of events during the workshop. Topics covered during the workshop were i) puberty, ii) menstruation, iii) clearing myths associated with menstruation, iv) hygienic menstrual practices, and v) safe disposal of used sanitary products. The workshop was conducted in the space provided by the school. The objectives of the workshop were i) to ensure that the adolescent schoolgirls understand the structure and function of the female reproductive system, ii) to ensure that the adolescent schoolgirls understand the changes occurring during puberty, iii) to explain the causes and changes occurring during menstruation, iv) to clear myths associated with menstruation, v) to ensure that the adolescent schoolgirls employ hygienic menstrual practices, and vi) to ensure that the adolescent schoolgirls understand the importance of safe disposal of used sanitary products. The facilitators encouraged participants to engage in activities and discussions, discussed learning issues using specific tasks, and asked questions to ensure that learning had occurred. At the end of the workshop, the facilitators summarised the key points and provided feedback.

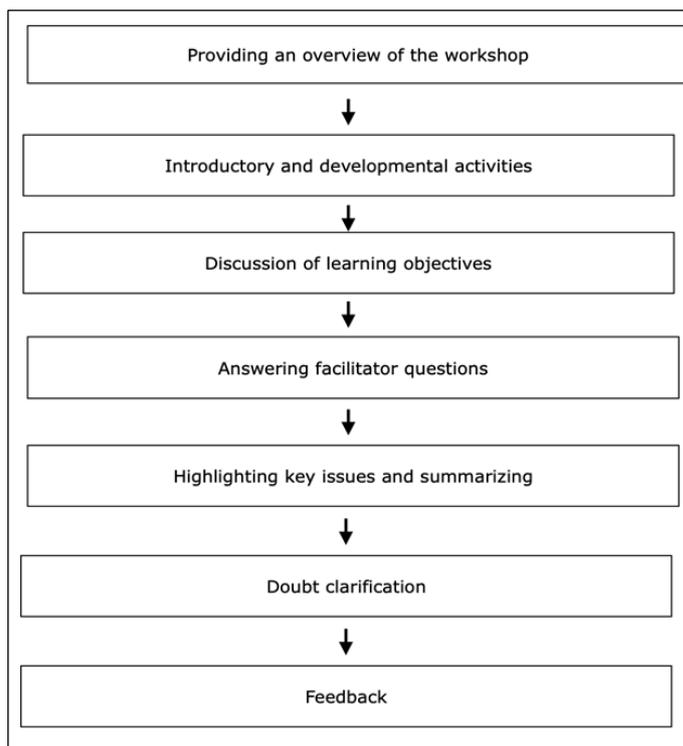


Figure 1: Flow of events during ‘Puberty to womanhood’ workshop

Sustainability and follow-up

Follow-up meetings between the interprofessional team members, parents, and teachers were organised with the adolescent schoolgirls three months post-workshop. The adolescent girls provided feedback on the changes they had incorporated since attending the workshop three months earlier. Two girls from each school volunteered to become representatives and distributed pamphlets and charts and ensured that the schoolgirls adhered to what was taught during the workshop. The pamphlets and charts contained information related to menstrual hygiene, contraception, sexually transmitted diseases, pregnancy, and childbirth.

Assessment

The assessment reflected the objectives and content of the module. Pre- and post-tests were carried out using multiple choice questions (MCQ). The participants were given 30 minutes to answer 30 MCQs encompassing the content of the module. The MCQ test had two sections: Section A, 15 questions about menstruation (maximum score =15), and Section B, 15 questions about hygienic menstrual practices (maximum score =15). Each correctly answered MCQ scored 1 mark. There was no negative marking. The participants were tested at three points; i) pre-workshop, ii) immediately post workshop, and iii) three months post-workshop, to assess the retention of knowledge.

Evaluation

Evaluation of the ‘Puberty to Womanhood’ module was conducted using a behaviour questionnaire regarding menstrual health practices. The questionnaire was designed by the interprofessional team and content-validated by a group of six members. The questionnaire was administered before the workshop and three months post-workshop. It contained questions on i) bathing every day, ii) using clean underwear every day, iii) cleaning the genitalia during every toilet visit, iv) using a single pad for less than ten hours, v) disposal of used pads in dustbins, vi) having dietary restrictions, vii) attending schools, viii) playing sports, and ix) attending social events like weddings during menstruation. Figure 2 shows the timeline of events during implementation of the ‘Puberty to Womanhood’ module.

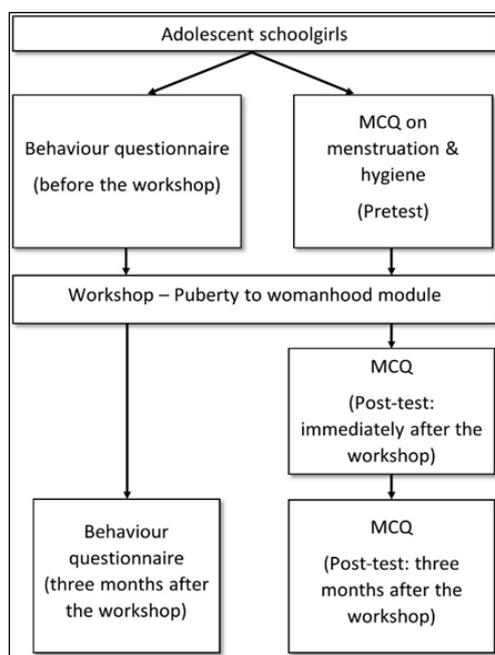


Figure 2: Timeline for flow of events during module implementation and evaluation.

Data analysis

Paired t-test was applied to compare the pre- and post-test values for the MCQ test scores. The Cronbach's alpha was calculated to assess the internal consistency of the questions. McNemar's test was used to compare the frequency and percentage of participants' practices during menstruation pre-workshop and three months post-workshop. Data were expressed as mean (standard deviation), and $p < 0.05$ was considered statistically significant.

RESULTS

MCQ test scores for knowledge of menstruation and hygienic menstrual practices before and after the workshops

Cronbach's alpha for the MCQs was 0.79. Table I shows the comparison of MCQ test scores for knowledge of menstruation and hygienic menstrual practices before and after the workshop. There was a significant improvement in knowledge about menstruation and hygienic menstrual practices immediately post-workshop ($p < 0.001$). However, three months post-workshop, showed a significant decrease in knowledge about

menstruation ($p < 0.001$). There was no significant change in the test score for hygienic menstrual practices. ($p = 0.489$).

Table I: Comparison of MCQ test scores for knowledge of menstruation and hygienic menstrual practices pre and post workshop (n=402)

Topic	Pre-workshop	Immediately post-workshop	3 months post- workshop
Knowledge about menstruation	5.9 (1.8)	11.1 (1.5)	9.2 (2.4)
Hygienic menstrual practices	5.8 (1.9)	9.9 (2.0)	9.8 (2.1)

Results are reported as mean (standard deviation).

Comparison of frequency and percentage of participants on practices during menstruation pre-workshop and three months post-workshop.

There was significant improvement in the number of participants who cleaned their genitalia on every visit to the toilet. The number of participants who used a single sanitary pad for more than ten hours was significantly lower, and there was a significant increase in the number of participants who disposed of used pads in dustbins, three months post-workshop. There was no significant difference in the frequency and percentage of participants after attending the workshops about bathing daily, using clean underwear daily, having dietary restrictions, attending schools, visiting holy places, attending social events such as weddings, and playing sports during menstruation (Table II).

Table II: Comparison of frequency and percentage of participants on practices during menstruation, pre- and three months post-workshop.

Practices during menstruation	Pre-workshop n (%)	3 months post-workshop n (%)	p value
Bathe everyday	291 (72.3)	329 (81.8)	0.137
Use clean underwear every day	235 (58.4)	277 (68.9)	0.070
Clean genitalia on every visit to the toilet	178 (44.2)	289(71.8)	< 0.001***
Use a single sanitary pad for >10 hours	143 (35.5)	89(22.1)	< 0.001***
Dispose of used sanitary pads in the dustbin	227 (56.4)	272 (67.6)	0.048*
Follow dietary restrictions	128 (31.8)	136(33.8)	0.666
Attend school	364 (90.5)	371 (92.2)	0.824
Play sports	278 (69.1)	274 (68.1)	0.898
Attend social events	209 (51.9)	240 (59.7)	0.156
Visit holy places	132 (32.8)	129 (32)	0.901

DISCUSSION

Various studies on reproductive health education have shown a positive impact on knowledge and practices during menstruation.²³⁻²⁶ Two pertinent studies conducted in the same region reported that reproductive health education interventions increased awareness among adolescent girls, enabling them to be more self-sufficient and mindful about their reproductive health.^{23,26} The present study showed a decline in knowledge of menstruation three months post-workshop. The 15 MCQs in this section were more theoretical than practical, which may have contributed to these findings. This research emphasises the need for regular, sustainable programmes and strategies to improve the retention of knowledge related to menstruation rather

than relying on a single two-hour workshop. Similar studies have highlighted the need for peer teaching, normalising menstruation through regular interactions and small group sessions.^{27,28} No change in retention of knowledge was observed among participants regarding the hygienic menstrual practices. This could be attributed to the distribution of pamphlets and educational materials between the end of the workshop and the administration of the second post-test. We believe that the retention of hygienic practice knowledge was attributed to the initial workshop and the follow-up materials as there was no decrease in knowledge below or equal to baseline levels. The inclusion of periodic reinforcement regarding menstruation and menstrual hygiene through peer-led follow-ups, empowering mothers, teacher training programmes, and community health workers would ensure retention of knowledge.²⁹

Changes were observed in self-reported practices three months post-workshop. There was an increase of 9.5% in those who reported bathing every day, but this parameter was not statistically significant probably due to the influence of practice in the household. Improvement was evident in the number of participants who self-reported that they cleaned their genitalia during every toilet visit (62.3%), disposed of used pads in dustbins (19.8%), and there was a significant reduction in the number of participants who said they used a single sanitary pad for more than ten hours in a day (37.8%). These results are comparable to the findings of Dongre et al., who showed that sexual health education programmes are essential at school. They reported that to prepare adolescents for puberty, a detailed reproductive health education before puberty is essential.²⁴ This would enhance long-term health and help them care for their future children. Schoolgirls who adopt hygienic practices have shown a lower incidence of urinary tract infections and reproductive tract infections, thereby enhancing their reproductive health.³⁰

Approaches to reproductive health education are complex, especially in some countries where it is considered sensitive and remains taboo.³¹⁻³³ Many cultural myths and incorrect beliefs about menstruation have been present for centuries, and despite their decline, still exist.³³ It is of prime importance that reproductive health education is imparted by parents, teachers, or both. However, there is often a disconnect regarding who should discuss these topics with the adolescents.³¹ It is difficult to isolate all the elements involved in determining learning and behavioural change in adolescents; however, culturally sensitive interventions delivered alongside education can improve effectiveness.⁷ This was evident in our study, particularly through the involvement of the interprofessional team. In addition to this, multiple interventions delivered in phases, alongside the regular school curriculum, the distribution of pamphlets or flipbooks, and the display of charts about menstrual hygiene in schools would contribute to improvements in knowledge, attitude, and behaviour.^{26,28}

Extending reproductive healthcare for adolescent schoolgirls is beyond the scope of any single profession. Collaboration among interprofessionals is vital for a more reliable and sustainable health education system.^{34,35} An interprofessional team-based approach helps to understand the broader context holistically, including medical, social, educational, and cultural aspects. This will enhance the quality of community-based research and raise awareness about menstruation and menstrual hygiene among adolescent schoolgirls.^{8,26}

The study had several limitations. More regular communication, for example through messaging applications, could have enhanced reinforcement of knowledge regarding menstruation. Loss to follow-up was mainly due to student absenteeism during the follow up and relocation. There may also have been self-reporting bias,

which is susceptible to social desirability bias. The absence of a control group makes it difficult to attribute all changes solely to the module. External factors such as media exposure and other school programmes may also have influenced the results. As this study was conducted in one specific region, the findings may not be inferred to all regions of India due to diverse socio-cultural contexts. The quality of study could have been enhanced with the inclusion of focus group discussions and participant feedback, as suggested in other studies.^{8,26}

To summarise, this study supports the existing literature and highlights the need to include a comprehensive reproductive health education module in the school curriculum. We recommend that training should first be provided to teachers and staff with the help of community health workers. These modules should be scaled up through electronic, social and national media to create awareness among the younger generation. This awareness would help address topics such as menstruation and menstrual hygiene among the adolescent schoolgirls who might otherwise be left to navigate these issues on their own. Reproductive health education programmes in schools can be customised based on cultural and financial background, while also taking into consideration attitudinal challenges such as fear and shame associated with accessing basic reproductive health care knowledge. With these approaches, resistance to change among young girls whose practices are influenced by traditional familial norms may be reduced. Furthermore, maintaining regular, time-bound reproductive health education interventions would go a long way towards educating and changing the mindset of these adolescents.

CONCLUSION

The inclusion of the 'Puberty to Womanhood' module improved and reinforced knowledge about menstruation and the appropriate hygienic practices during menstruation. This study highlights the importance of and the need to include a focused and sustainable curriculum for adolescent girls. This will contribute to the general well-being of adolescent girls and may have a substantial impact on their education and quality of life, both individually and at the societal level.

INSTITUTIONAL REVIEW BOARD (ETHICS COMMITTEE)

The study was approved by the Institutional Ethics Committee (IEC KMC MLR 08-17/149). Consent was obtained from adolescent schoolgirls' parents, as well as students. Permission was obtained from the schools before conducting the workshops.

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