

# Effectiveness of Video-Assisted Teaching on Preparation of Menarche Among Adolescent Girls in Selected Areas of Pune City

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## ABSTRACT

**Background:** Menarche, the first occurrence of menstruation, is a defining milestone in an adolescent girl's life. Despite its universal occurrence, many girls in India remain inadequately prepared due to social taboos and lack of structured education. Video-Assisted Teaching (VAT) offers an innovative solution by combining audio-visual elements to make complex physiological concepts accessible and memorable.

**Objectives:** To assess the pretest knowledge and preparedness of adolescent girls regarding menarche, to evaluate the effectiveness of VAT in improving knowledge and preparedness, and to find any association between pretest scores and selected demographic variables.

**Methods:** A quasi-experimental, one-group pretest–posttest design was adopted. A total of 100 adolescent girls aged 9–16 years were recruited from selected areas of Pune City using purposive sampling. A structured knowledge questionnaire and a preparedness assessment scale were administered before and after the VAT intervention. Data were analyzed using paired t-test and chi-square test.

**Results:** The mean pretest knowledge score was  $9.77 \pm 4.78$ , which improved significantly to  $25.43 \pm 4.69$  post-intervention ( $t = 21.882$ ,  $p < 0.00001$ ). Preparedness scores also improved significantly from  $2.87 \pm 1.30$  to  $5.59 \pm 2.00$  ( $t = 11.82$ ,  $p < 0.00001$ ). No statistically significant association was found between pretest scores and demographic variables.

**Conclusion:** VAT is a highly effective educational strategy for preparing adolescent girls for menarche. Widespread integration of video-based health education in schools and community settings is strongly recommended to promote menstrual health literacy.

**Keywords:** Menarche, Video-Assisted Teaching, Adolescent Girls, Menstrual Hygiene, Preparedness, Puberty Education, Quasi-Experimental Study.

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## INTRODUCTION

Menarche marks the beginning of a girl's reproductive life and is widely considered one of the most significant physiological milestones of female adolescence. Occurring typically between the ages of 10 and 16 years, menarche is influenced by a complex interplay of genetic, nutritional, and environmental factors.<sup>1</sup> In India, the average age at menarche has been reported to range from 11.5 to 13.5 years, though considerable regional and socioeconomic variation exists. Factors such as body mass index, nutritional status, physical activity levels, and family history are known to influence the timing of menarche. Despite being a universal biological phenomenon, menarche is often surrounded by cultural taboos, misinformation, and deep-rooted social stigma, especially in resource-limited and rural communities across India.

Studies have consistently shown that a significant proportion of Indian adolescent girls are unprepared for their first menstrual period.<sup>2</sup> Many girls report feelings of

shock, fear, and confusion upon experiencing menarche for the first time, largely because they had never received any prior education about the process. This lack of preparedness can lead to heightened anxiety and embarrassment, which may negatively affect a girl's psychological well-being, school attendance, and overall quality of life. The absence of prior education about menstrual hygiene further increases the risk of reproductive tract infections, poor menstrual practices, and long-term health consequences.<sup>3</sup>

In many Indian households and schools, menstruation is treated as a forbidden or shameful topic, leaving girls to rely on informal, often inaccurate peer-to-peer communication or internet sources for information. Traditional educational approaches, such as pamphlets, verbal explanations by teachers or parents, and didactic classroom sessions, often fall short in terms of engagement and information retention, particularly among young adolescents who are increasingly accustomed to digital and multimedia learning environments.<sup>4</sup>

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In contrast, audio-visual methods commonly referred to as Video-Assisted Teaching (VAT) have demonstrated remarkable effectiveness in health education by combining visual, auditory, and narrative elements that cater to multiple learning modalities. Research across various health domains has shown that learners retain approximately 65% of information presented through video compared to only 10% from reading text alone.<sup>5</sup> VAT has been found to improve comprehension, memory retention, and attitude change, making it especially suitable for sensitive health topics such as puberty and menstruation. The engaging, non-judgmental format of video content also helps reduce the psychological barriers that young girls often experience when discussing menstruation.<sup>6</sup>

Given this background, the present study was undertaken to assess and improve menarche preparedness among adolescent girls in Pune City through a structured VAT intervention. The findings are expected to contribute to evidence-based health education programming for adolescent girls in India and to support school nurses and community health workers in delivering adolescent-friendly reproductive health education.

### NEED FOR THE STUDY

Adolescent health remains a priority area under India's National Health Mission (NHM), with particular emphasis on menstrual health and hygiene as part of the Rashtriya Kishor Swasthya Karyakram (RKSK). According to the National Family Health Survey (NFHS-5, 2019–21), a notable percentage of adolescent girls in urban and peri-urban Maharashtra still lack basic knowledge about menstruation before its onset.<sup>7</sup> This knowledge gap results in fear, secrecy, and unhygienic practices — such as the use of unclean cloth instead of sanitary pads that can have lasting physical and psychological health consequences. Poor menstrual hygiene management has been linked to increased rates of reproductive tract infections, school absenteeism, and diminished self-esteem among adolescent girls.

A review of existing literature indicates that while several studies have evaluated the impact of structured teaching programmes on menarche knowledge, interventions using video-assisted methods specifically tailored for community-based adolescent populations in Maharashtra remain limited. The digital age has created a generation of learners who respond more effectively to multimedia presentations than to traditional teaching methods. Video-based educational tools have been shown to significantly improve health literacy across various target populations, including schoolchildren, antenatal mothers, and community women.<sup>8</sup> Despite this growing evidence, structured VAT programs for menarche preparation remain sparse in community settings around Pune City, highlighting a critical gap this study aims to address.

There is a profound need for community-level, culturally sensitive, and age-appropriate educational interventions

targeting adolescent girls before the onset of menarche. Social media and television exposure, while widely accessible, do not provide medically accurate or structured information about puberty and menstruation. Video-assisted teaching, when designed with adolescent-friendly content and delivered in familiar and safe settings, can bridge the existing knowledge gap, dismantle deep-rooted myths, and empower young girls to manage menstruation with confidence, dignity, and proper hygiene. Nurses and community health workers, as frontline educators, are uniquely positioned to implement such evidence-based interventions at the grassroots level.

### AIM OF THE STUDY

To assess the effectiveness of Video-Assisted Teaching in improving knowledge and preparedness regarding menarche among adolescent girls aged 9–16 years in selected areas of Pune City, and to find any association between pretest knowledge scores and selected demographic variables.

### RESEARCH METHODOLOGY

A quantitative research approach with a quasi-experimental, one-group pretest–posttest design was used. This design was selected because it allowed the researchers to measure changes in knowledge and preparedness before and after the intervention without requiring a separate control group, which is ethically appropriate for educational interventions.

The study was conducted in selected community areas of Pune City, Maharashtra, India. The target population comprised adolescent girls aged 9–16 years who had not yet experienced menarche or had limited knowledge about it and were willing to participate. A total of 100 participants were recruited using purposive sampling based on power analysis to achieve adequate statistical power ( $\alpha = 0.05$ , power = 80%). Adolescent girls aged 9–16 years residing in the selected area; no menarche or limited prior knowledge; willingness to participate. Girls who had received formal menarche education in the past 6 months; those with diagnosed medical conditions affecting puberty; girls with significant learning disabilities. The data collection instrument comprised three sections: (i) Section I – Sociodemographic data; (ii) Section II – A 30-item structured knowledge questionnaire on menarche preparation covering physiology, hygiene, emotional changes, myths, and nutrition; (iii) Section III – An 8-item preparedness scale assessing practical readiness. The tool was validated by five content experts. Internal consistency was assessed using Cronbach's alpha ( $\alpha = 0.81$  for knowledge scale;  $\alpha = 0.79$  for preparedness scale), confirming satisfactory reliability. A pilot study was conducted on 10 girls (not included in the main study) to test feasibility, clarity, and timing of the tool. Minor modifications were made based on feedback before the main data collection.

A structured VAT module of approximately 30–40 minutes was developed covering: (a) introduction to

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puberty and hormonal changes; (b) definition and average age of menarche; (c) physiological changes and menstrual cycle phases; (d) menstrual hygiene management and product use; (e) coping with emotional changes; (f) nutrition and lifestyle guidance; (g) myth-busting; and (h) building confidence and reducing stigma. A simple feedback form using a 1–5 scale was administered immediately after the session.

Data were entered in Microsoft Excel and analyzed using SPSS v21. Descriptive statistics (frequency, percentage, mean, SD) were used to summarize demographic and outcome data. The paired t-test was applied to assess effectiveness, and the chi-square test was used to find associations between pretest scores and demographic variables. A p-value < 0.05 was considered statistically significant.

## RESULTS

### Section 1. Demographic Profile

**Table 1: Sociodemographic Profile of Study Participants (N = 100)**

Demographic Variable	Frequency (F)	Percentage (%)
<b>Age Group</b>		
09–11 years	33	33
12–14 years	34	34
15 years and above	33	33
<b>Type of Family</b>		
Nuclear	42	42
Joint	23	23
Extended	35	35
<b>Monthly Family Income (₹)</b>		
Below ₹10,000	23	23
₹10,001–20,000	26	26
₹20,001–40,000	28	28
Above ₹40,000	23	23
<b>Prior Awareness of Menstruation</b>		
Yes	46	46
No	54	54

Table 1 presents the sociodemographic characteristics of the 100 participants. Age distribution was approximately equal across three groups: 09–11 years (33%), 12–14 years (34%), and 15 years and above (33%). Regarding family type, the majority were from nuclear families (42%), followed by extended (35%) and joint (23%)

families. Monthly income was distributed across four levels with 28% in the ₹20,001–40,000 range. Notably, 54% of participants had not heard about menstruation at all before the study, and among the 46% who had, television (11%) and social media or internet (10%) were the most common sources of information.

### Section 2: Finding Related To Pre-Test And Post-Test Knowledge Scores

Figure 1 shows the distribution of knowledge scores before and after VAT. In the pretest, 60% of participants had poor knowledge (mean = 9.77, SD = 4.78), 38% had average knowledge, and only 2% demonstrated good knowledge. Following the intervention, a remarkable shift was observed: 84% of participants achieved good knowledge scores, 16% showed average knowledge, and none remained in the poor category (mean = 25.43, SD = 4.69).



**Figure 1: Comparison of pre-test and post-test knowledge levels after Video-Assisted Teaching on menarche.**

### Section 3: Finding Related To Effectiveness Of Vat On Knowledge

**Table 2: Effectiveness of VAT on Knowledge of Menarche — Paired t-test (N = 100)**

Test	Mean	SD	df	t-value	p-value	Remark
Pre-test	9.77	4.78	99	21.882	0.00001	Significant
Post-test	25.43	4.69	99			

As shown in Table 2, the paired t-test revealed a highly significant difference between pretest (mean = 9.77, SD = 4.78) and posttest (mean = 25.43, SD = 4.69) knowledge scores ( $t = 21.882$ ,  $df = 99$ ,  $p < 0.00001$ ). This confirms that the VAT intervention led to a substantial and statistically significant improvement in knowledge about menarche among the study participants, thereby accepting H1.

#### Section 4: Finding Relate To Effectiveness Of Vat On Preparedness

Figure 1 displays the paired t-test results for preparedness scores. The mean preparedness score improved from 2.87 (SD = 1.30) in the pretest to 5.59 (SD = 2.00) in the posttest ( $t = 11.82$ ,  $df = 99$ ,  $p < 0.00001$ ). This statistically significant improvement demonstrates that the VAT intervention effectively enhanced practical preparedness for menarche among adolescent girls.



Figure 2: Pre-test vs Post-test preparedness scores after Video-Assisted Teaching on Menarche

#### SECTION 5: FINDING RELATED TO ASSOCIATION OF PRETEST SCORES WITH DEMOGRAPHIC VARIABLES

Chi-square analysis was performed to identify any association between pretest knowledge levels and demographic variables including age, class, family type, mother's education, mother's occupation, father's education, father's occupation, monthly income, prior awareness, and source of information. The calculated chi-square values did not exceed the table values at the respective degrees of freedom for any variable (all  $p > 0.05$ ), indicating no statistically significant association between pretest scores and any demographic variable. This suggests that the baseline knowledge deficit was widespread and uniform across all subgroups, independent of sociodemographic background.

#### DISCUSSION

The present study found a highly significant improvement in menarche-related knowledge following VAT, with the mean score rising from 9.77 to 25.43 ( $t = 21.882$ ,  $p < 0.00001$ ). The proportion of participants with good knowledge increased dramatically from 2% to 84%, while none remained in the poor knowledge category posttest. These findings are consistent with Thakre et al.,<sup>9</sup> who reported widespread knowledge deficits regarding menstrual hygiene among school girls in Maharashtra, and Dasgupta and Sarkar,<sup>10</sup> who documented that 58.8% of Indian adolescent girls were unaware of menstruation before its onset underscoring the critical value of pre-menarche educational interventions.

Preparedness scores similarly improved from 2.87 to 5.59 ( $t = 11.82$ ,  $p < 0.00001$ ), confirming that VAT builds not only theoretical knowledge but also practical readiness. This supports the systematic review by Hennegan and

Montgomery, which concluded that structured health education interventions significantly improve psychosocial preparedness for menstruation among adolescent girls in low- and middle-income countries.<sup>11</sup>

No significant association was found between pre-test knowledge scores and any demographic variable (all  $p > 0.05$ ), indicating that the knowledge deficit was uniform across all subgroups regardless of age, family type, parental education, or income. These findings highlight the need for universal implementation of VAT-based menarche education across all community settings in India.

#### CONCLUSION

This study provides compelling evidence that Video-Assisted Teaching is a highly effective strategy for improving menarche knowledge and preparedness among adolescent girls aged 9–16 years. Before the intervention, the majority of participants lacked even basic knowledge about menstruation; after a single structured VAT session, 84% achieved good knowledge levels, and preparedness scores improved significantly both with  $p$ -values below 0.00001.

Given that poor menarche preparedness was uniformly distributed across all demographic subgroups, universal implementation of structured VAT programs in schools and community health centres is strongly recommended. Nurses, community health workers, and school health educators are uniquely positioned to deliver these interventions. Future research should explore the long-term retention of knowledge, the impact of repeat sessions, and the effectiveness of VAT across diverse cultural and linguistic settings in India.

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