



ORIGINAL

## Influence of a Teaching Module on Adolescent Girls' Understanding and Perception of Early Menarche

### Influencia de un módulo didáctico en la comprensión y percepción de la menarquia precoz por parte de las adolescentes

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#### ABSTRACT

The commencement of menarche, which signifies the first occurrence of menstrual bleeding, holds considerable importance in the lives of young girls going through adolescence. This research aimed to evaluate the influence of a Teaching module on the understanding and outlook pertaining to early menarche in adolescent girls. Employing a quantitative research design, a sample of 300 participants was chosen using uncomplicated random selection methods. The investigation employed a structured knowledge questionnaire and a five-point rating system to assess participants' comprehension and perception. The experimental group initially perceived early menarche moderately (68 %). Results from their first assessment indicated 45,3 % lacked sufficient knowledge, 42,7 % had moderately acceptable knowledge, and 12 % demonstrated satisfactory knowledge. Impressively, the subsequent evaluation showed a substantial improvement, with 97,3 % now possessing adequate knowledge, and only 2,7 % retaining moderately acceptable knowledge. Conversely, the control group's initial review displayed 83,3 % inadequate knowledge and 16,7 % moderately acceptable knowledge. Following the intervention, the control group had 72,7 % maintaining insufficient knowledge and 26,7 % displaying moderate perception. 32 % have a favorable perception. Post-module, 92 % showed a good perception, 8 % remained moderate. The module effectively enhanced knowledge and perception on early menarche. This study underscores the pivotal role of targeted educational interventions in amplifying knowledge and perception concerning early menarche. The outcomes highlight the potential benefits of such interventions in equipping adolescent girls with essential information and awareness to navigate this transformative phase in their lives effectively.

**Keywords:** Teaching Module; Perception; Early Menarche; Adolescent Girls.

#### RESUMEN

El comienzo de la menarquia, que significa la primera aparición del sangrado menstrual, tiene una importancia considerable en la vida de las jóvenes que atraviesan la adolescencia. El objetivo de esta investigación era evaluar la influencia de un módulo didáctico sobre la comprensión y las perspectivas relativas a la menarquia precoz en las adolescentes. Empleando un diseño de investigación cuantitativo, se eligió una muestra de 300 participantes mediante métodos de selección aleatoria sin complicaciones. La investigación empleó un cuestionario estructurado de conocimientos y un sistema de calificación de cinco puntos para evaluar la comprensión y la percepción de los participantes. El grupo experimental percibía inicialmente la menarquia precoz de forma moderada (68 %). Los resultados de su primera evaluación indicaron que el 45,3 % carecía de conocimientos suficientes, el 42,7 % tenía conocimientos moderadamente aceptables y el 12 % demostró tener conocimientos satisfactorios.

Sorprendentemente, la evaluación posterior mostró una mejora sustancial, ya que el 97,3 % poseía ahora conocimientos adecuados y sólo el 2,7 % conservaba conocimientos moderadamente aceptables. Por el contrario, la evaluación inicial del grupo de control mostró un 83,3 % de conocimientos inadecuados y un 16,7 % de conocimientos moderadamente aceptables. Tras la intervención, el grupo de control tenía un 72,7 % que mantenía conocimientos insuficientes y un 26,7 % que mostraba una percepción moderada. El 32 % tiene una percepción favorable. Tras el módulo, el 92 % mostraba una percepción buena y el 8 % moderada. El módulo mejoró eficazmente los conocimientos y la percepción sobre la menarquia precoz. Este estudio subraya el papel fundamental de las intervenciones educativas específicas para ampliar los conocimientos y la percepción sobre la menarquia precoz. Los resultados ponen de relieve los beneficios potenciales de este tipo de intervenciones a la hora de dotar a las adolescentes de información y concienciación esenciales para afrontar con eficacia esta fase transformadora de sus vidas.

**Palabras clave:** Módulo Didáctico; Percepción; Menarquia Precoz; Adolescentes.

## INTRODUCTION

Early menarche, the onset of menstruation before the age of 12 years, has emerged as a significant topic of research and concern in recent years. Adolescence marks the phase between puberty and adulthood. The onset of menarche, a significant event in the lives of young girls, serves as a key indicator of puberty. <sup>(1)</sup> Research indicates that improved sanitary, nutritional, and economic conditions within a society tend to lead to an earlier occurrence of menarche. <sup>(2)</sup> While typically falling within the age range of 10 to 16 years, the timing of menarche displays notable variability. <sup>(3)</sup>

This phenomenon has attracted attention due to its potential implications for the physical, psychological, and social well-being of individuals. The age at which girls experience their first menstrual period has been declining over the past few decades, raising questions about the underlying causes and the short- and long-term consequences of early menarche. In India, there exists a population of 253 million individuals within the age range of 10 to 19 years. This particular age bracket consists of people who are undergoing a temporary phase of life that necessitates provisions such as nourishment, education, as well as emotional support and direction, all of which are crucial for their progression into well-rounded adults.

Understanding the variables that lead to early menarche is critical for establishing effective methods to address its influence on numerous areas of health. Both genetic and environmental factors play a role in the timing of menarche. Genetic influences are thought to account for a substantial portion of the variation in menarcheal age, while environmental factors such as nutrition, obesity, physical activity, and exposure to endocrine disruptors may also contribute.

Early menarche is associated with a range of potential consequences, including reproductive health outcomes, metabolic consequences, psychological impacts, and social implications. Girls who experience early menarche may be at higher risk for reproductive health issues such as polycystic ovary syndrome (PCOS), endometriosis, and early pregnancy. Moreover, an early onset of menarche has been associated with a heightened likelihood of encountering metabolic conditions like obesity, type 2 diabetes, and cardiovascular diseases during the later stages of life. Psychologically, early menarche may be associated with a higher likelihood of developing depressive symptoms, anxiety, and body dissatisfaction. Socially, early-maturing girls may face challenges related to body image, peer relationships, and overall adjustment.

Recognizing the potential consequences of early menarche, interventions and support systems have been proposed to mitigate its impact. Educational programs targeting girls and their families can provide valuable information about reproductive health, healthy lifestyle choices, and emotional well-being. Psychosocial support, including counseling and peer support, can help girls navigate the challenges associated with early menarche. Healthcare professionals also have a pivotal role in attending to the physical and emotional requirements of girls who undergo early menarche. This involves overseeing their condition, offering suitable supervision, and delivering essential interventions whenever deemed necessary.

## METHODS

The intended group for this experimental study consisted of adolescent girls who attained Menarche before 12 years. From the Tiruvallur district, two government schools and two private schools were selected after completing the survey, and samples were chosen using simple random sampling. Inclusion criteria were: being an adolescent female child, aged between 10 and 12 years, and having experienced menarche within the past year. Exclusion criteria were: students who were absent on the day of data collection, children with co-morbid diseases, and parents who did not give consent.

The study's sample size was determined by referencing analogous research, utilizing a correlation coefficient

with a significance level of  $r=0,25$ , statistical power (B) set at 90 %, a type I error alpha ( $\alpha$ ) of 0,05, and a confidence level of 95 %. As a result of these parameters, the study was projected to involve 132 participants.

$P1 = 25 \% = 0,25$   $P2 = 41 \% = 0,41$   $C = Z(1-B) = 7,85$  (0,05 level)

Initially, the minimal required sample size for each group was calculated to be 132 participants. However, with the aim of enhancing the study's statistical power, a total of 300 children experiencing early menarche were eventually chosen. Following a random selection process, these girls were divided into two groups: the control group (consisting of 150 participants) and the intervention group (Number=150).

Formal permission was obtained from the relevant authorities, and ethics approval was obtained from the Institute Ethical Committee (IEC). Before conducting the surveys, the researchers scheduled meetings with the school principals to clarify the study's objective. Subsequently, the principals sought approval from the school boards to carry out the study. Once an understanding was reached, a timetable and the terms for conducting the research were established.

Before taking part in the study, all participants provided their consent, and parental consent was also obtained. Upon the researcher's arrival at the schools, the students were already gathered in a designated classroom for the survey.

The participants were made aware of their option to discontinue their participation in the survey at any stage. Additionally, they were given the guarantee that the information they provided would be kept confidential and anonymous.

Adolescent girls were briefed on the study's aim. Demographic data were gathered through interviews. A structured knowledge questionnaire gauged awareness of early menarche, while a five-point scale measured perception. Following a six-week teaching intervention, a post-test assessed changes in knowledge and perception. Descriptive and inferential statistics analyzed the data, with a significance level of 5 % and P-value below 0,05 for all tests.

## RESULTS

Among the 300 interviewed adolescent girls, in the experimental group, most (102,68 %) were aged 12, as were the majority (76, 50,7 %) in the control group. Menarche at 11 years was common for the majority of girls, with 90 (60 %) in the experimental group and 75 (50 %) in the control group. Most girls in both groups came from one-sibling families, 101 (67,3 %) in the experimental and 93 (62 %) in the control. Similarly, girls living in nuclear families were the majority, 92 (61,3 %) in the experimental and 103 (68,7 %) in the control. Religiously, Hinduism was identified by most in both groups, 116 (77,3 %) in the experimental and 108 (72 %) in the control. Both groups saw fathers who had completed high school, 66 (44 %) in the experimental and 77 (51,3 %) in the control, as did mothers, 52 (34,7 %) in the experimental and 73 (48,7 %) in the control. Most in the experimental group were second-born (69,46 %), while in the control group, most were first-born (79, 52,7 %). In terms of family income, most in the experimental group earned 10001-50000 rs monthly (73, 48,7 %), compared to the control group where the majority earned less than 10000 rs (105, 70 %). Urban areas were home to most girls, 89 (59,3 %) in the experimental and 80 (53,3 %) in the control. Most lived with both parents, 128 (85,3 %) in the experimental and 112 (74,7 %) in the control. Finally, for the majority of girls in both the experimental and control groups, mothers served as the main source of information regarding menarche. In the experimental group, this accounted for 81 participants (54 %), while in the control group, it was 111 participants (74 %).

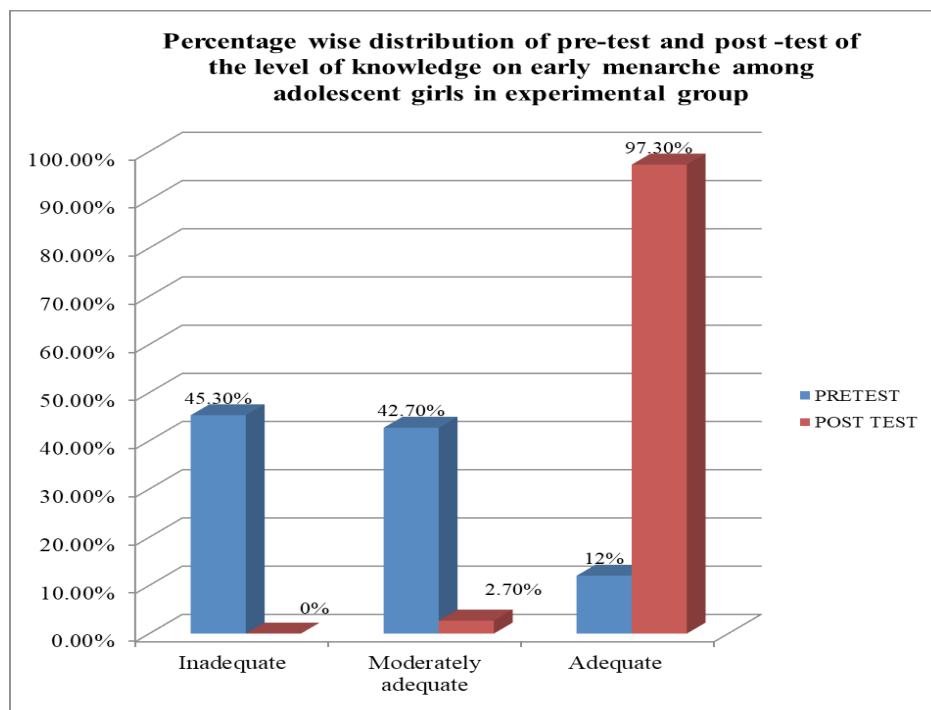
In the pretest of the experimental group, most adolescent girls had insufficient knowledge (68, 45,3 %), while 64 (42,7 %) had moderate knowledge and 18 (12 %) had sufficient knowledge about early menarche. The mean knowledge score was 9,48 (SD = 4,92). In the post-test, notable improvement occurred, with the majority of girls having sufficient knowledge (146, 97,3 %) and only 4 (2,7 %) having moderate knowledge. The mean post-test knowledge score was 20,91 (SD = 1,922).

These findings highlight the positive effect of the instructional module on adolescent girls' knowledge of early menarche, as seen in the increase of those with sufficient knowledge in the post-test compared to the pretest.

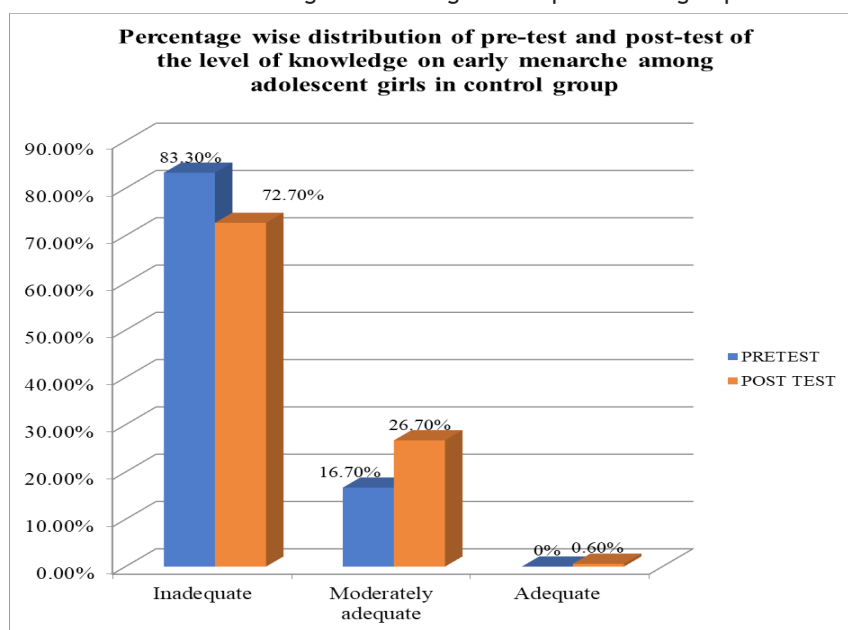
The majority of teenage females in the control group showed inadequate knowledge in the pretest, with 125 participants (83,3 %). In contrast, 25 individuals (16,7 %) demonstrated a moderate degree of expertise. The pretest's mean knowledge score was determined to be 6,21, with a standard deviation (SD) of 2,63.

In the post-test, results showed a continued lack of sufficient knowledge for most girls (109, 72,7 %), with 40 (26,7 %) having moderate knowledge. Only 1 participant (0,6 %) attained adequate knowledge. The post-test mean knowledge score was 6,63 (SD = 2,84)

These findings indicate that the control group's knowledge about early menarche didn't significantly improve post-study. Mean knowledge levels remained relatively steady, suggesting the instructional module's impact on the experimental group didn't extend to the control group.



**Figure 1.** Frequency and Percentage-wise distribution of pretest and post -test of the level of knowledge on early menarche among adolescent girls in experimental group



**Figure 2.** Frequency and percentage-wise distribution of pre-test and post-test of the level of knowledge on early menarche among adolescent girls in the control group

In the experimental group's pretest, most adolescent girls had moderate perception (102, 68 %) of early menarche, while 48 (32 %) exhibited good perception. The pretest mean perception score was 38,70 (SD = 5,61).

Post-test results revealed significant enhancement in perception levels. The majority of adolescent girls (138, 92 %) now demonstrated good perception, with only 12 (8 %) maintaining moderate perception. The post-test mean perception score was 45,96 (SD = 3,63).

These findings underscore the instructional module's positive impact on adolescent girls' perception of early menarche. The post-test reflected a substantial increase in those possessing good perception compared to the pretest, affirming the intervention's effectiveness in enriching their understanding and awareness of early menarche.

In the control group's pretest, most adolescent girls displayed moderate perception (116, 77,3 %) of early menarche, while 34 (22,7 %) demonstrated good perception. The pretest mean perception score was 37,27 (SD = 5,59).

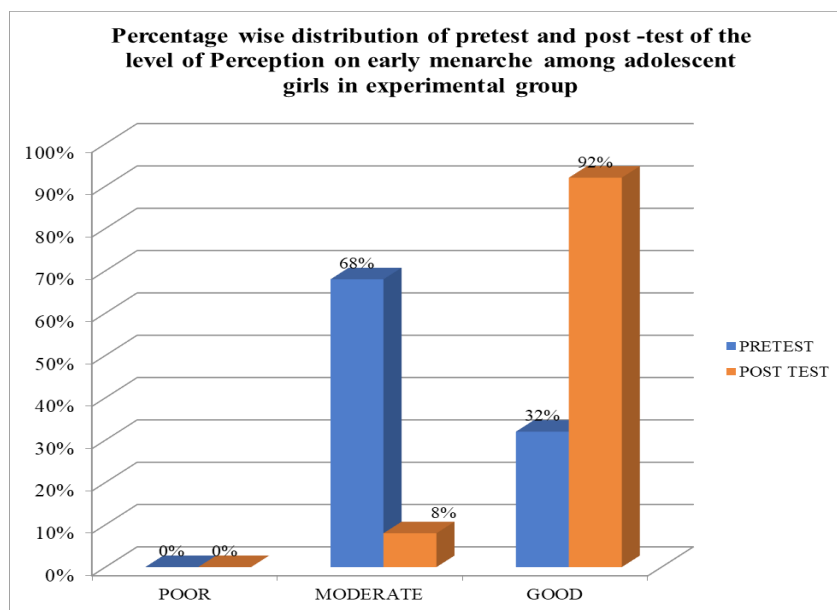


Figure 3. Percentage-wise distribution of pretest and post-test of the level of Perception on early menarche among adolescent girls in the experimental group

In the post-test, a significant number of adolescent girls (128, 85,3 %) retained a moderate level of perception, while 22 participants (14,7 %) exhibited a higher level of perception. The average perception score in the post-test was calculated as 37,32, with a standard deviation (SD) of 4,69.

These findings signify that the control group's perception of early menarche remained largely unaltered post-study. The mean perception levels stayed consistent between pretest and post-test, suggesting the instructional module intervention, aimed at the experimental group, did not notably affect the control group's perception levels.

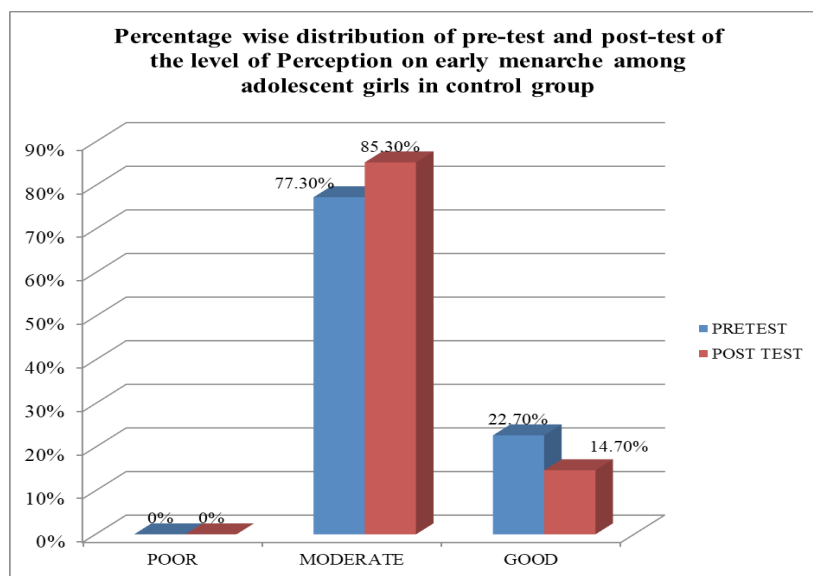
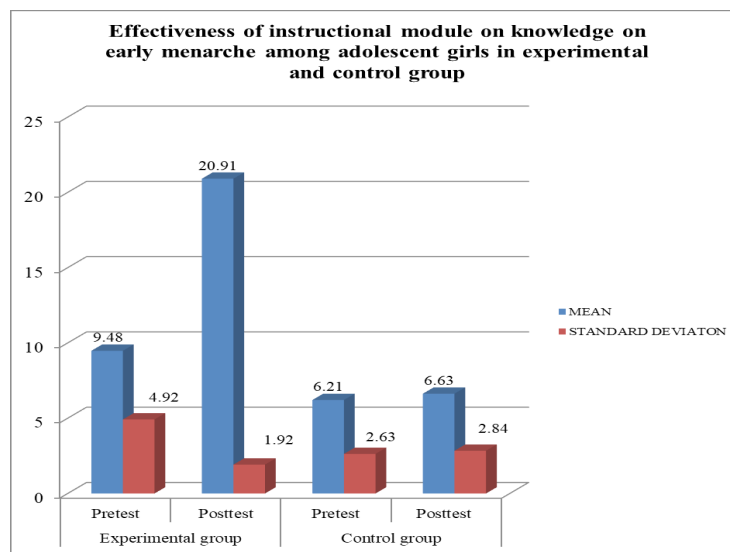


Figure 4. Percentage wise distribution of pre-test and post-test of the level of Perception on early menarche among adolescent girls in control group

In the experimental group, the instructional module effectively increased knowledge regarding early menarche among adolescent girls, with a mean pre-test score of 9,48 (SD = 4,92) and a post-test score of 20,91 (SD = 1,92). The paired t-test yielded a highly significant value of  $t = 26,46$ , underscoring the module's impact on knowledge enhancement in this group.

Conversely, in the control group, the instructional module had minimal impact on knowledge, as evidenced by a mean pre-test score of 6,21 (SD = 2,63) and a post-test score of 6,63 (SD = 2,84). The paired t-test value of  $t = 1,43$  indicated a lack of statistical significance, implying the module had limited effect on knowledge levels in the control group.

In summary, the instructional module effectively boosted knowledge among adolescent girls in the experimental group but did not yield significant improvements in the control group.

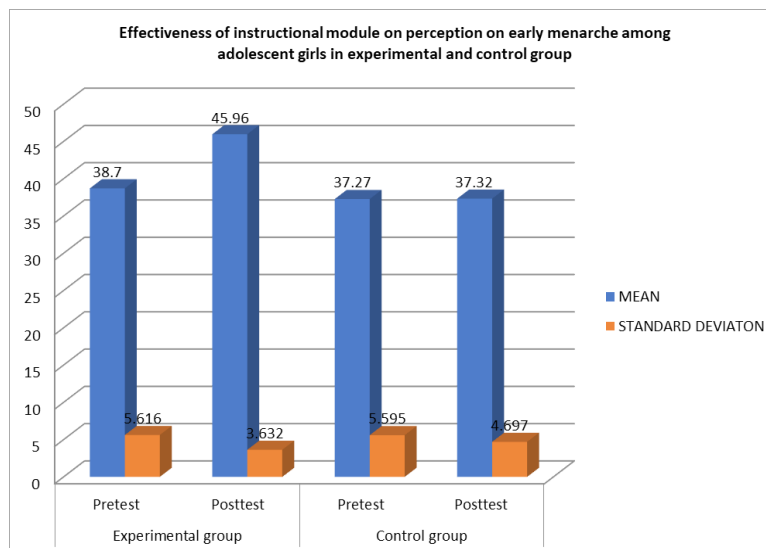


**Figure 5.** Effectiveness of instructional module on knowledge on early menarche among adolescent girls in experimental and control group

In the experimental group, the instructional module notably increased perception levels about early menarche among adolescent girls, as seen in a mean pre-test score of 39,7 (SD = 5,616) and a post-test score of 45,96 (SD = 3,632). The paired t-test value of  $t = 12,98$  indicated a highly significant difference, illustrating the module's significant impact on improving perception in this group.

In contrast, within the control group, the instructional module had minimal effect on perception, with a mean pre-test score of 37,27 (SD = 5,595) and a post-test score of 37,32 (SD = 4,697). The paired t-test value of  $t = 0,072$  indicated a lack of statistical significance, suggesting the module had limited impact on perception levels in the control group.

In summary, the Teaching module effectively enhanced perception levels among adolescent girls in the experimental group, while its impact was not statistically significant in the control group.



**Figure 6.** Effectiveness of instructional module on perception on early menarche among adolescent girls in experimental and control group

In the experimental group's pre-test, the knowledge-perception correlation was positively significant ( $r = 0,313$ ,  $p = 0,000$ ), indicating that increased knowledge related to improved perception of early menarche among adolescent girls.

In contrast, the control group's pre-test showed a non-significant negative correlation ( $r = -0,095$ ,  $p = 0,248$ ), suggesting no consistent connection between knowledge and perception of early menarche.



In the post-test, both groups displayed positive correlations between knowledge and perception (experimental:  $r = 0,046$ ,  $p = 0,580$ ; control:  $r = 0,056$ ,  $p = 0,495$ ). Yet, these correlations were not significant, indicating no strong link between knowledge and perception after the intervention.

**Table 1.** Comparison of the effectiveness of instructional module on knowledge, perception on early menarche among adolescent girls in experimental and control group

	Test	Group	Mean	Standard deviaton	Mean difference	't' value independent -t test	Df	'p' value
Knowledge	Pre test	Experimental group	9,48	4,92	3,27	7,17	298	0,053 NS
		Control group	6,21	2,63				
	Post test	Experimental group	20,91	1,92	14,27	50,95	298	0,000 **HS
		Control group	6,63	2,84				
Perception	Pre test	Experimental group	38,70	5,61	1,42	2,204	298	0,068 NS
		Control group	37,27	5,59				
	Post test	Experimental group	45,96	3,63	8,64	17,82	298	0,000 **HS
		Control group	37,32	4,69				

In summary, the pre-test demonstrated a positive correlation within the experimental group, whereas such a correlation was not observed within the control group. Post-test results showed no significant correlations in either group, suggesting the instructional module intervention had minimal effect on the knowledge-perception relationship in early menarche understanding.

## DISCUSSION

The primary goal of this research was to assess the effectiveness of an educational component in improving teenage girls' awareness and understanding of early menarche. In this section, we will delve into the implications of the research results, their alignment with the current body of literature, and the potential ways in which these findings can contribute to the field of reproductive health education for adolescents.

### Knowledge Enhancement

The findings of this study demonstrate a considerable enhancement in the comprehension levels of teenage girls within the experimental group following their exposure to the instructional module. In the preliminary assessment of the experimental group, the average knowledge score concerning early menarche in teenage girls was 9.48, accompanied by a standard deviation of 4.92. After the post-test, the average knowledge score regarding early menarche among teenage girls escalated to 20.91, with a standard deviation of 1.922. These outcomes are consistent with previous research underlining the significance of well-structured interventions in providing accurate information to adolescents.<sup>(4)</sup>

The substantial rise in average knowledge levels from the pre-test to the post-test highlights the efficacy of the module in effectively conveying crucial information about early menarche. The research conducted by Chakor G also supports the notion that the distribution of an Information Booklet serves as a pivotal tool for fathers to enhance their knowledge and self-awareness concerning their daughters' menstruation.<sup>(5)</sup> This study's outcomes also coincide with those of Sandhya P.<sup>(10)</sup>

An observable improvement in the average post-test knowledge score (12.13) within the experimental group, surpassing that of the control group (5.83) ( $t$  value = 8.52,  $p < 0.05$ ), is consistent with another study by Paul Reji PR, where the difference in mean knowledge scores between the pre-test and post-test was statistically significant ( $t = 25.974$ ,  $df = 59$ , and  $p < 0.001$ ).<sup>(9)</sup> This study, conducted by Villasari A, Suprpto SI, Indasah I., The significance of health education was 0.000, showing that health education through video had a noticeable effect on lowering student anxiety levels, with an influence coefficient value of 2.756.<sup>(8)</sup>

Furthermore, the findings of the Samson SA, Singh CD, and Paliwal HA research revealed that the average knowledge score after the post-test (18.81) exceeded the average pre-test score (11.33).<sup>(6)</sup> The sum of the pre-test and post-test knowledge scores (7.48) demonstrated significance at the 0,05 % level, with " $t$ " = 17.57 and  $*p < 0.05$ . These findings support the intended educational program's efficacy in increasing pre-pubertal girls' understanding of menarche.<sup>(11)</sup>

### Perception Shift

The educational module also precipitated a favorable change in the viewpoint regarding early menarche among teenage girls within the experimental group. These findings underscore the importance of instructional interventions not only in augmenting knowledge but also in reshaping perception. This discovery aligns with the research conducted by Shanbhag D, Only 39,3 % of participants menstruation was considered as a physiological process.<sup>(12)</sup> The most prevalent medical issue encountered by respondents was abdominal pain or discomfort (66,2 %), and 45,8 % reported facing multiple problems. Conversations about medical problems were predominantly held with mothers (47,1 %), while discussions with teachers were least common (0,4 %). To alleviate menstrual pain, analgesics were the most commonly employed remedy (75,6 %), with only 10 % of respondents resorting to non-pharmacological solutions.<sup>(13)</sup>

Another study by Education M. revealed that among 200 adolescents, 88 % possessed average knowledge levels, 95,5 % exhibited negative perceptions, and a majority of them (52,5 %) were adequately prepared for menarche.<sup>(7)</sup>

In the study conducted by Serret-Montoya J. et al., a total of 346 female adolescents were enrolled. The prevailing perspective on menstruation was characterized as negative in 65,6 % (n = 227) of cases, positive in 16 % (n = 55), discreet in 13 % (n = 45), and uncertain in 5,4 % (n = 19) of cases. Surprisingly, having a persistent medical condition was shown to be a protective factor against acquiring a negative perspective of menstruation (with an odds ratio of 0.4 [95 % confidence interval: 0.20-0.78, p = 0.007]).<sup>(14)</sup>

### Differential impact

Interestingly, the teaching module did not demonstrate a significant impact on knowledge or perception levels among adolescent girls in the control group. This discrepancy could be attributed to various factors, including the existing knowledge base of the control group, potential external influences, or differences in learning receptivity. Future studies could delve into these aspects to uncover underlying factors.<sup>(15,16)</sup>

### Correlation between knowledge and perception

The initial correlation analysis indicated a positive association between knowledge and perception of early menarche among adolescent girls in the experimental group. This finding suggests that as knowledge levels increased, perceptions became more favorable. However, the absence of significant correlations in both groups after the intervention suggests that factors beyond knowledge contribute to shaping perceptions.

### Implications for Adolescent Reproductive Health Education

The outcomes of this study carry valuable implications for adolescent reproductive health education programs. The demonstrated effectiveness of the teaching module highlights the importance of evidence-based educational interventions in addressing knowledge gaps and fostering positive perceptions. School curricula and public health initiatives can benefit from incorporating similar modules to empower young girls with accurate information and dispel misconceptions.<sup>(17,18,19)</sup>

### Limitations and Future Research

Recognizing the importance of acknowledging limitations, it's noteworthy to mention that this study was carried out within a distinct geographical area, potentially constraining the broader applicability of the results. The sample size and socio-cultural factors within the study area could have influenced the outcomes. Additionally, future research could explore the long-term sustainability of knowledge and perception changes over time.

## CONCLUSION

In conclusion, this study underscores the positive impact of a teaching module on enhancing knowledge and perception of early menarche among adolescent girls. The findings emphasize the potential of structured educational interventions in promoting accurate information and fostering positive attitudes. By addressing the gaps in reproductive health education, such interventions contribute to the holistic well-being of adolescent girls and empower them to make informed decisions about their health.

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The authors affirm the absence of any conflicts of interest.

#### **AUTHORSHIP CONTRIBUTION**

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Formal analysis: Motcha Rakkini L

Acquisition of funds: Nil

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Methodology: Motcha Rakkini L, Hema V.H

Project management: Motcha Rakkini L

Resources: NA

Software: Motcha Rakkini L

Supervision: Motcha Rakkini L

Validation: Motcha Rakkini L

Display: NA

Drafting - original draft: Motcha Rakkini L

Writing - proofreading and editing: Motcha Rakkini L, Hema V.H