THE EFFECT OF EDUCATION AND GAMIFICATION (INTERACTIVE QUIZ) ON TEENAGERS PERCEPTIONS OF MENSTRUAL MYTHS

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ABSTRACT

Menstrual myths remain an issue in adolescent reproductive health because inaccurate beliefs may influence how girls understand and respond to menstruation. At the study site, preliminary assessment identified that some female students still believed menstrual myths. An educational approach that is active, engaging, and compatible with adolescents' digital habits is therefore needed. Objective: This study aimed to determine the effect of education and gamification through an interactive quiz on adolescents' perceptions of menstrual myths at SMAN 3 Sukoharjo. Methods: A quantitative pre-experimental one-group pretest–posttest design was used. The study involved 53 female tenth-grade students selected by purposive sampling from a population of 233 students. Perceptions were measured using a 20-item questionnaire before and after the intervention. The intervention combined health education about menstrual myths and facts with an interactive quiz. Normality was assessed using the Shapiro–Wilk test and the difference between pretest and posttest scores was analyzed using the Paired Sample T-Test. Results: The mean perception score increased from 57.98 before intervention to 76.04 after intervention, representing an increase of 18.06 points. The Paired Sample T-Test showed p = 0.000 (p < 0.05), indicating a statistically significant difference. After intervention, 38 respondents (71.7%) were in the high-perception category, 15 (28.3%) were moderate, and none were in the low category. Conclusion: Education combined with gamification through an interactive quiz significantly improved adolescents' perceptions of menstrual myths and may be used as an

	alternative interactive method for reproductive-health education in schools.
KEYWORDS	Education; Gamification; Interactive Quiz; Perception; Menstrual Myths.
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INTRODUCTION

Adolescence is a developmental period characterized by physical, psychological, cognitive, and social changes. In female adolescents, menstruation is one of the important physiological signs of reproductive maturation. Although menstruation is a normal biological process, adolescents do not always receive accurate and complete information about it. Information may come from parents, peers, cultural practices, social media, or other informal sources, and these sources do not necessarily provide scientifically appropriate explanations.

One consequence of limited or inaccurate information is the persistence of menstrual myths. Menstrual myths refer to beliefs, prohibitions, or assumptions concerning menstruation that are not consistent with appropriate health information. Such beliefs may include restrictions on bathing, physical activity, food or drink, and social or religious activities. When these beliefs are accepted without adequate clarification, menstruation may be viewed as something shameful, dangerous, or limiting rather than as a normal physiological process.

Perception is important because it reflects how adolescents interpret and evaluate information about menstruation. A perception that is based on myths may affect confidence, emotional responses, communication, and everyday behavior during menstruation. Conversely, a more accurate perception may help adolescents understand menstruation rationally and make healthier decisions. The thesis underlying this article identifies family, culture or taboo, peers, social media, emotional readiness, curiosity, and age as factors that can influence adolescent perceptions.

Health education is one strategy for correcting misinformation. However, the effectiveness of education depends not only on the accuracy of the content but also on the way information is delivered. Conventional one-way lectures can be less engaging for adolescents when the topic is sensitive or when students are accustomed to interactive digital media. Consequently, educational methods that allow students to participate actively are increasingly relevant.

Gamification is an educational approach that incorporates elements and mechanisms of games into a non-game context. In this study, gamification was implemented through an interactive quiz concerning menstrual myths and facts. The quiz allowed students to answer questions, encounter challenges, receive immediate feedback, and review the correct information. The approach was intended to reinforce the preceding educational material and to create a learning environment that was more active and enjoyable.

The literature reviewed in the thesis supports the use of gamification in health education. Previous studies cited by the researcher reported improvements in engagement, knowledge, attitudes, readiness for menarche, and menstrual-health behaviors following game-based or interactive educational interventions. The reviewed studies also indicate that gamification

can reduce the sense of intimidation around sensitive reproductive-health topics because students participate in a more relaxed learning environment.

Nevertheless, previous research identified in the thesis has generally focused on knowledge, attitudes, readiness for menarche, hygiene behavior, or broader reproductive-health outcomes. The present study differs by specifically examining adolescents' perceptions of menstrual myths before and after a combined education and interactive-quiz intervention. This focus is important because correcting myths requires not only knowledge acquisition but also a change in how adolescents evaluate information that they may have previously accepted as true.

The selection of SMAN 3 Sukoharjo was based on a preliminary study. On 11 February 2026, the researcher conducted an initial assessment involving 20 female students. Twelve students (60%) were reported to still believe several menstrual myths, while 8 students (40%) showed understanding that was more consistent with menstrual-health facts. This finding demonstrated that the problem existed directly in the target setting and provided a practical basis for conducting an intervention study.

Based on the above background, this study was conducted to determine whether education and gamification using an interactive quiz affect adolescents' perceptions of menstrual myths at SMAN 3 Sukoharjo. The findings are expected to provide an evidence-based consideration for schools, teachers, health workers, and future researchers when designing reproductive-health education that is participatory and suitable for adolescents.

RESEARCH METHOD

This quantitative study used a pre-experimental one-group pretest–posttest design. The population comprised 233 female tenth-grade students at SMAN 3 Sukoharjo, with 53 respondents selected by purposive sampling. Data were collected using the 20-item Kuesioner Persepsi Remaja terhadap Mitos Menstruasi (KPRMM), which had a Cronbach's Alpha of 0.962. Respondents completed a pretest, received education on menstrual myths and facts followed by an interactive quiz, and then completed the posttest. Data normality was assessed using the Shapiro–Wilk test, and pretest–posttest differences were analyzed using the Paired Sample T-Test at $p < 0.05$.

RESULT AND DISCUSSION

1. Respondent Characteristics

The final analysis included 53 female respondents. The study focused on female tenth-grade students because menstruation is the reproductive-health issue specifically examined. The respondents were drawn from classes X5 and X7, with 17 respondents (32.1%) from X5 and 36 respondents (67.9%) from X7. All respondents were female, representing 100% of the sample.

2. Perception Before Education and Gamification

Table 1. Perception Before Education and Gamification

Category	n	%
Low (believing myths)	7	13.2
Moderate	46	86.8
High	0	0.0
Total	**53**	**100.0**

The pretest results showed that the mean perception score was 57.98. Most respondents were in the moderate category, namely 46 students (86.8%), while 7 students (13.2%) were in the low category and none were in the high category. Based on the scoring framework, higher scores indicate a more rational perception and lower acceptance of menstrual myths. Thus, the pretest results indicate that the majority of respondents had perceptions that were not yet optimal, and a proportion of respondents still had perceptions consistent with menstrual myths.

3. Perception After Education and Gamification

Table 2. Perception After Education and Gamification

Category	n	%
Low (believing myths)	0	0.0
Moderate	15	28.3
High	38	71.7
Total	**53**	**100.0**

Following the intervention, the mean perception score increased to 76.04. The high-perception category contained 38 respondents (71.7%), while 15 respondents (28.3%) remained in the moderate category. No respondent remained in the low-perception category. The categorical shift is substantial because respondents moved from a distribution dominated by the moderate category before intervention to a distribution dominated by the high category after intervention.

4. Comparison of Pretest and Posttest Scores

Table 3. Comparison of Pretest and Posttest Scores

Measurement	Mean	N	SD	SE
Pretest	57.98	53	8.619	1.184
Posttest	76.04	53	4.233	0.582

The descriptive comparison shows an increase of 18.06 points between the mean pretest and posttest scores. In addition to the increase in the mean, the standard deviation decreased from 8.619 to 4.233, suggesting that posttest scores were more concentrated around the higher mean than pretest scores.

5. Paired Sample T-Test

Table 4. Paired Sample T-Test

Comparison	Mean Difference	t	df	p-value
Pretest – Posttest	-18.057	-19.039	52	0.000

The Paired Sample T-Test produced a significance value of 0.000, which is below 0.05. Therefore, the null hypothesis was rejected and the alternative hypothesis was accepted. The statistical result indicates a significant difference in adolescents' perception scores before and after education and gamification using the interactive quiz.

Discussion: Baseline Perception

The relatively low mean score at baseline can be interpreted in the context of the information environment surrounding menstruation. The thesis describes menstruation as a topic that may still be associated with taboo, embarrassment, and limited open discussion. When information is obtained from informal sources without adequate clarification,

adolescents may accept repeated beliefs as facts. The presence of 7 respondents in the low-perception category before intervention confirms that some respondents still held perceptions associated with menstrual myths.

The dominance of the moderate category (86.8%) is also important. It suggests that many respondents were not completely committed to myths but did not yet have sufficiently strong, rational perceptions to be classified as high. This group may be particularly responsive to accurate health information because their perceptions can still be strengthened through clarification and active learning. Therefore, the educational intervention was not merely intended to provide new facts but also to challenge uncertainty and incorrect assumptions.

Discussion: Effect of Education and Gamification

The increase from a mean score of 57.98 to 76.04 demonstrates that perceptions changed in the expected direction after the intervention. The change of 18.06 points, combined with the p-value of 0.000, indicates that the observed improvement was statistically significant within the study group. The disappearance of the low category and the emergence of a high-perception majority provide additional descriptive support for the statistical finding.

Education likely contributed by providing a structured explanation of menstruation and by distinguishing myths from facts. Correct information gives adolescents a reference point against which previously received beliefs can be evaluated. However, the intervention did not stop at information delivery. The interactive quiz required students to actively respond to statements or questions about menstrual myths and facts. This activity creates an opportunity for respondents to recognize misconceptions and immediately receive clarification.

The use of gamification is particularly relevant to adolescents because it can make learning more participatory. Game elements such as questions, challenges, scoring, and immediate feedback can maintain attention and encourage respondents to process information rather than simply listen. The thesis literature review similarly reports that gamification can increase engagement, motivation, understanding, and retention of health information.

Another important mechanism is immediate feedback. In a conventional lecture, a student may not know whether a personal belief is correct until asking a question. In an interactive quiz, the response can be followed by an explanation or correction. This immediate feedback can help connect the information delivered during education with the respondent's own understanding. In the context of menstrual myths, this is especially useful because some beliefs may have been acquired repeatedly from peers, family, or social media.

The findings are consistent with previous studies cited in the thesis. Pradipta et al. reported an effect of educational games on menstrual-hygiene behavior, while Dayati et al. reported that gamified education could improve knowledge and attitudes concerning menarche. Ayunda et al. reported increased readiness for menarche after gamification-based education. These studies address different outcomes, but collectively they support the broader proposition that interactive and game-based approaches can be useful in adolescent reproductive-health education.

The present study contributes a more specific focus on perceptions of menstrual myths. A positive perception is important because health education may be less effective

when adolescents know factual information but continue to evaluate menstruation through myth-based assumptions. The observed shift in perception therefore suggests that combining factual education with an active learning experience can help adolescents reassess previously held beliefs.

Implications

The findings have practical implications for school-based reproductive-health education. Schools may consider incorporating short interactive quizzes after reproductive-health lessons to reinforce key messages and identify misconceptions. Health workers and school counselors may also use interactive digital activities when discussing sensitive topics because the format can create a less intimidating learning atmosphere. Nevertheless, the intervention should remain evidence-based, age-appropriate, and accompanied by clear explanations so that gamification does not reduce a health topic to a competition alone.

Study Limitations

The study has several limitations. First, it used a one-group pre-experimental design without a control group, so changes cannot be attributed exclusively to the intervention with the same level of certainty as a randomized controlled design. Second, the sample consisted of 53 female tenth-grade students from one school, which limits generalization to adolescents in other schools or age groups. Third, the measured outcome was perception immediately after the intervention; the study did not establish whether the change was maintained over a longer period or translated into sustained behavior. Future studies can address these limitations through controlled designs, larger and more diverse samples, follow-up measurements, and additional behavioral outcomes.

CONCLUSION

Education and gamification using an interactive quiz significantly affected adolescents' perceptions of menstrual myths at SMAN 3 Sukoharjo. The mean perception score increased from 57.98 at pretest to 76.04 at posttest, with an improvement of 18.06 points. The Paired Sample T-Test showed $p = 0.000$ ($p < 0.05$). Before intervention, 86.8% of respondents were in the moderate category and 13.2% were in the low category; after intervention, 71.7% were in the high category, 28.3% were moderate, and no respondents remained in the low category. These findings support the use of interactive, gamification-based education as an alternative strategy for adolescent reproductive-health education, particularly for correcting perceptions related to menstrual myths.

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