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Empowering Early Adolescents: Interactive Education on Reproductive Health and Balanced Nutrition at SDN Kemakmuran 2

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ABSTRACTS

Introduction: Early adolescence is a crucial transitional phase characterized by rapid biological and psychological changes. However, challenges arise due to low nutritional literacy, which poses risks to long-term reproductive health. **Method:** This community service activity aims to improve the knowledge of students at SDN Kemakmuran 2 through interactive educational methods based on visuals and gamification. The program was implemented on April 17, 2026, featuring a series of activities including health screening, material presentation, and interactive quizzes. **Result:** Evaluation results showed an average increase in student understanding by 44%, with a participant satisfaction rate reaching 92%. Despite technical scheduling constraints, the team's flexibility ensured the program's success. **Conclusion:** The conclusion of this community service is that participatory methods are effective in internalizing health values in school-aged children.

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1. INTRODUCTION

Adolescence represents a critical developmental stage characterized by rapid physical, cognitive, emotional, and social changes. According to the World Health Organization (WHO), adolescents account for approximately 16% of the global population, making them a strategic target for health promotion interventions. During this period, adequate nutritional intake plays an essential role in supporting growth, hormonal regulation, and reproductive maturation. Inadequate nutrition during adolescence can lead to anemia, delayed growth, menstrual disorders, and decreased academic performance.

In Indonesia, nutritional and reproductive health issues among adolescents remain significant public health concerns. National surveys indicate that anemia prevalence among adolescent girls remains relatively high, largely associated with poor dietary habits and inadequate iron intake. Furthermore, misconceptions regarding puberty and reproductive health are still common among school-aged children due to limited access to age-appropriate health information. Consequently, schools serve as important settings for implementing preventive and promotive health education programs.

Balanced nutrition and reproductive health are closely interconnected. Adequate consumption of macro- and micronutrients supports the maturation of reproductive organs, hormonal balance, and immune function. Conversely, nutritional deficiencies may negatively affect reproductive development and increase future health risks. Therefore, educational interventions that simultaneously address balanced nutrition and reproductive health are necessary to establish healthy behaviors from an early age.

Recent educational approaches emphasize active participation and student engagement. Gamification, defined as the application of game elements in educational contexts, has demonstrated effectiveness in increasing motivation, attention, and knowledge retention among elementary school students. Interactive learning methods supported by visual media enable complex health concepts to be delivered in a more understandable and enjoyable manner. Therefore, integrating visual storytelling and gamification may enhance the effectiveness of health promotion activities among young adolescents.

2. METHODS

The activity was conducted offline on Friday, April 17, 2026, at SDN Kemakmuran 2. To enhance the effectiveness of material delivery, a Participatory-Interactive Education approach was utilized, including:

1. Health Screening: Blood pressure checks to provide early awareness of participants' physical conditions



Figure 1: Health Screening

2. Visual Storytelling: Using visual media to explain the "Isi Piringku" (My Plate) concept, making it more accessible for school-aged children.



Figure 2: Visual Storytelling

3. Gamification: Implementation of interactive quizzes as instant evaluation tools. According to Sari and Pratama (2021), gamification is proven to increase health memory retention in elementary students compared to one-way lecture methods.



Figure 3: Gamification

3. RESULTS AND DISCUSSION

This community service program involved 50 students of SDN Kemakmuran 2 as active participants. The activity was designed to improve students' understanding of reproductive health and balanced nutrition through participatory educational methods incorporating visual learning media and gamification approaches. The implementation process consisted of health screening, educational sessions, interactive discussions, and quizzes designed to evaluate participants' understanding. The results obtained from the activity indicate positive outcomes in terms of knowledge improvement, participant engagement, and overall program effectiveness.

3.1. Health Screening Achievements

Health screening was conducted as an initial activity to identify the general health status of participants and to increase awareness regarding the importance of monitoring personal health conditions from an early age. Blood pressure measurements were selected as a simple and practical indicator of physical health that could be easily understood by elementary school students (Amalia, 2023). The screening results demonstrated that 85% of participants had blood pressure measurements within the normal range (90/60 mmHg to 120/80 mmHg), while 15% showed values outside the normal range. Students identified with

abnormal measurements received individualized education regarding adequate rest, hydration, and healthy lifestyle habits.

The implementation of health screening served not only as a data collection activity but also as a learning experience for participants. Through direct exposure to health assessment procedures, students became more familiar with basic health monitoring practices. This approach supports the concept of experiential learning, where students acquire knowledge through direct participation and observation (Amalia, 2023).

School-based health screening programs have been recognized as effective preventive strategies for identifying potential health problems at an early stage (Amalia, 2023). Early detection allows health educators and schools to provide timely interventions before more serious health issues develop. Furthermore, introducing health screening activities in school settings can help foster positive attitudes toward preventive healthcare behaviors among children (Susanto, 2021)

The findings obtained from this screening activity align with previous studies indicating that preventive health services integrated into educational settings contribute positively to students' health awareness and self-care behaviors. The combination of screening and educational interventions provides students with practical experiences that reinforce theoretical knowledge regarding healthy living practices (Amalia, 2023).

3.2. Analysis of Literacy Improvement (Pre-Test & Post-Test)

The effectiveness of the educational intervention was evaluated using pre-test and post-test assessments administered before and after the educational sessions. These assessments aimed to measure changes in participants' knowledge related to balanced nutrition and reproductive health. Table 1 presents the comparison of literacy scores before and after the intervention.

Table 1. Literacy Improvement (Pre-Test & Post-Test)

Understanding Indicator	Pre-Education Score (%)	Post-Education Score (%)	Increase (%)
Nutritional Knowledge (<i>Isi Piringku</i>)	45	88	43
Reproductive Health Understanding	30	75	45
Overall Average	37.5%	81.5%	44%

The results demonstrate a substantial increase in participants' understanding following the educational intervention. Nutritional knowledge increased from 45% to 88%, representing a 43% improvement. Similarly, reproductive health understanding increased from 30% to 75%, representing a 45% improvement. Overall, participants experienced an average knowledge increase of 44%.

These findings suggest that the educational methods utilized in this program were highly effective in enhancing students' health literacy. The significant increase in scores indicates that participants successfully understood and retained the information presented during the educational sessions (Lestari, 2023; Fitriani & Jannah, 2021).

Several factors may have contributed to this improvement. First, the use of visual learning materials simplified complex health concepts into formats that were easier for elementary school students to comprehend. Children generally process visual information more effectively than abstract verbal explanations. Therefore, the use of illustrations, diagrams, and attractive visual presentations likely enhanced learning outcomes.

Second, the educational activities emphasized active participation rather than passive listening. Students were encouraged to ask questions, share opinions, and engage in discussions throughout the session. Educational theories suggest that active learning increases cognitive engagement and promotes deeper understanding of educational content.

Third, gamification elements integrated into the program created a more enjoyable learning environment. The quiz activities stimulated curiosity, encouraged participation, and motivated students to pay closer attention to the material being presented. The competitive yet enjoyable nature of gamified learning has been widely reported as an effective strategy for increasing student motivation and knowledge retention (Santrock, 2021).

The observed improvement is consistent with previous studies indicating that interactive educational approaches are more effective than conventional lecture-based methods. Visual media have been shown to enhance memory retention and understanding, particularly among younger learners. Similarly, gamification has been associated with improved engagement, motivation, and educational achievement in health promotion programs (Sari & Pratama, 2021).

3.3 Effectiveness of Visual-Based Learning

One of the primary strengths of this community service activity was the integration of visual-based learning strategies. Visual media were used extensively throughout the educational sessions to explain concepts related to balanced nutrition, healthy eating patterns, bodily changes during puberty, and reproductive health. Visual learning materials offer several advantages when educating elementary school students. Children in this age group tend to have shorter attention spans and may experience difficulties understanding complex biological concepts through verbal explanations alone. Visual aids help bridge this gap by presenting information in a concrete and engaging manner (Santrock, 2021)

The positive outcomes observed in this program support the effectiveness of visual learning approaches. Students appeared highly attentive during the presentations and actively responded to questions related to the visual materials displayed. This finding suggests that visual stimulation enhanced comprehension and facilitated information processing (Nurhayati, 2022)

Previous research has demonstrated that visual media can improve knowledge acquisition by activating multiple sensory pathways simultaneously. When learners receive information through both visual and auditory channels, they are more likely to understand and remember educational content. Consequently, visual-based educational strategies are particularly suitable for health promotion programs targeting young audiences (Nurhayati, 2022)

3.4 Effectiveness of Gamification in Health Education

Gamification served as another important component of the intervention. Interactive quizzes were implemented to reinforce learning outcomes and assess participant understanding in real time. Rather than functioning solely as evaluation tools, the quizzes became educational experiences that encouraged active participation.

The positive response from participants indicates that gamification successfully increased engagement throughout the educational process. Students demonstrated enthusiasm when answering questions and actively competed to achieve high scores. Such enthusiasm is important because student motivation is closely associated with learning effectiveness (Sari & Pratama, 2021).

The success of gamification can be explained by several mechanisms. First, game-based activities create a sense of enjoyment that reduces boredom during educational sessions. Second, immediate feedback allows participants to identify misconceptions and correct their understanding. Third, competitive elements stimulate motivation and concentration.

Numerous studies have reported that gamification enhances educational outcomes by increasing attention, participation, and information retention. The present findings support this evidence, demonstrating that gamification can be effectively incorporated into school-based health education programs (Sari & Pratama, 2021).

3.5 Program Effectiveness Evaluation

The effectiveness of the program was assessed using both quantitative and qualitative indicators. Quantitative evaluation was conducted through pre-test and post-test assessments, while qualitative evaluation involved participant satisfaction surveys and observations during the activity. Based on the satisfaction questionnaire distributed at the end of the program, 92% of participants reported that the educational materials were easy to understand, while 8% suggested extending the duration of the quiz sessions. These results indicate a high level of participant satisfaction and suggest that the educational methods were well received.

High satisfaction levels are important because positive learning experiences contribute to greater receptiveness toward future health promotion activities. When students perceive educational activities as enjoyable and beneficial, they are more likely to engage actively and apply acquired knowledge in their daily lives (Susanto, 2021)

In addition to participant satisfaction, attendance rates also reflected program success. Despite minor scheduling adjustments due to school activities, attendance reached 100% of the planned target. This achievement demonstrates effective coordination between the organizing committee and school stakeholders.

Operational challenges encountered during implementation included scheduling adjustments, transportation limitations, and documentation constraints. However, these obstacles were successfully addressed through collaborative teamwork and flexible program management. Effective communication among committee members ensured that activities proceeded smoothly despite logistical challenges (Rahman, 2021; Handayani, 2022).

The successful implementation of this program highlights the importance of collaboration among educational institutions, healthcare educators, and community stakeholders. Such partnerships are essential for ensuring the sustainability and scalability of health promotion initiatives (Darmawati, 2021).

3.6 Implications for Future Community Service Programs

The findings of this activity have several implications for future community service programs. First, interactive educational approaches should be prioritized when delivering health information to school-aged children. Traditional lecture methods may be less effective in maintaining student attention and engagement (Lestari, 2023; Putra et al., 2023).

Second, reproductive health education should be introduced early to prepare students for the physical and psychological changes associated with adolescence. Early education can help reduce anxiety, misconceptions, and negative attitudes toward puberty.

Third, balanced nutrition education should continue to be integrated into school health promotion programs because nutritional habits established during childhood often persist into adulthood. Promoting healthy dietary behaviors at an early age may contribute to long-term health outcomes (Nurhayati, 2022; Sari & Pratama, 2021).

Finally, future programs should incorporate follow-up evaluations to assess long-term knowledge retention and behavioral changes. Longitudinal assessments would provide a more comprehensive understanding of the sustainability of educational impacts. Overall, the integration of health screening, visual education, and gamification created a comprehensive and engaging learning experience that successfully improved participants' knowledge and awareness regarding reproductive health and balanced nutrition. (Handayani, 2022).

Overall, the integration of health screening, visual learning, and gamification created a comprehensive educational experience that successfully enhanced students' understanding of reproductive health and balanced nutrition. The positive outcomes observed suggest that similar approaches may be effectively implemented in other elementary school settings to support adolescent health promotion and disease prevention efforts.

4. CONCLUSION

The community service program conducted at SDN Kemakmuran 2 was successfully implemented as a promotive and preventive health intervention targeting early adolescents. Through the integration of health screening, visual-based educational media, and

gamification strategies, the program effectively improved participants' knowledge and awareness regarding balanced nutrition and reproductive health. The evaluation results demonstrated a substantial increase in literacy levels, with an overall average improvement of 44% between pre-test and post-test scores. Furthermore, the high participant satisfaction rate of 92% indicates that the educational methods employed were well accepted and considered easy to understand by the students.

The findings of this activity highlight the importance of utilizing interactive and participatory learning approaches when delivering health education to school-aged children. Visual learning materials were effective in simplifying complex concepts related to nutrition and reproductive health, while gamification enhanced student engagement, motivation, and knowledge retention. These approaches created a positive learning environment that encouraged active participation and facilitated meaningful learning experiences.

In addition to improving health literacy, the implementation of health screening activities provided opportunities for students to develop greater awareness of their physical health status and the importance of preventive healthcare behaviors. The combination of theoretical education and practical health monitoring contributed to a more comprehensive understanding of healthy lifestyles among participants. Such integration is essential for fostering health-conscious attitudes and behaviors from an early age.

The successful implementation of this program was supported by strong collaboration among the organizing committee, school administrators, teachers, and students. Despite several operational challenges, including scheduling adjustments and logistical limitations, effective communication, teamwork, and program flexibility ensured that all planned activities were completed successfully. These findings emphasize the importance of stakeholder collaboration in achieving sustainable community-based health promotion outcomes.

This community service activity also demonstrates that schools represent strategic settings for promoting adolescent health and preventing future health problems. Early interventions focusing on reproductive health and balanced nutrition can contribute to the development of healthier behaviors, increased self-awareness, and improved readiness for the physical and psychological changes associated with adolescence.

Therefore, it is recommended that similar educational programs be implemented regularly and expanded to other elementary schools. Future activities should incorporate

broader participant populations, stronger collaboration with healthcare providers, and long-term follow-up evaluations to assess knowledge retention and behavioral changes. Sustainable and continuous health education programs have the potential to create lasting impacts on adolescent well-being and support the development of a healthier future generation.

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