Media Kesehatan Politeknik Kesehatan Makassar
ISSN : 1907-8153 (Print)
e-ISSN : 2549-0567 (Online)

# The Effectiveness of a Child-Centered Learning Approach as a Nursing Intervention in Improving Adolescents' Knowledge about Early Marriage: A Quasi-Experimental Study

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*Article Information: Received January 2026; Accepted May 2026; Published June 2026*

**ABSTRACT**

Early marriage remains a significant public health concern with adverse consequences for adolescents' health, education, and psychosocial development. This study aimed to evaluate the effectiveness of child-centered learning Approach as a nursing intervention in improving adolescents' knowledge regarding early marriage. A quasi-experimental study with a pretest–posttest control group design was conducted in Borongloe Subdistrict, Bontomarannu District, Gowa Regency. A total of 100 adolescents aged 15–18 years participated in the study and were assigned to either an intervention group (n = 50) and a control group (n = 50). The intervention group received health education based on a Child-Centered Learning Approach that emphasized active learner engagement, collaborative learning, critical thinking, problem-solving activities, and the use age-appropriate educational materials. The control group received conventional lecture-based health education. Adolescents' regarding early marriage was measured before and after the intervention using a structured questionnaire. Data were analyzed using the Wilcoxon signed-rank test for within-group comparisons and the Mann–Whitney U test for between-group comparisons. The mean knowledge score in the intervention group increased from 55.44 to 87.00, while the control group showed only a slight change from 58.00 to 75.36. Statistical analysis showed a significant improvement in knowledge scores among adolescents in the intervention group after receiving child-centered learning–based health education ($p < 0.001$). In contrast, no significant change was observed in the control group. Comparative analysis between the two groups revealed a statistically significant difference in post-test knowledge scores ($p < 0.001$), indicating the effectiveness of the child-centered learning approach. These findings indicate that health education delivered through a child-centered learning approach can significantly improve adolescents' knowledge regarding early marriage.

Keywords: Child-centered learning; early marriage; adolescents; nursing intervention; knowledge

## INTRODUCTION

Early marriage remains a significant public health and social issue with substantial implications for adolescents' reproductive health, education, and psychosocial development[1,2]. Adolescents who marry before the age of 18 face higher risks of early pregnancy, obstetric complications, school dropout, and limited economic opportunities[3-5]. Globally, it is estimated that approximately 12 million girls are married before the age of 18 each year, indicating that early marriage continues to affect adolescents in many low- and middle-income countries[6]. Although several countries have implemented policies aimed at delaying marriage, the practice remains prevalent in parts of South Asia and Southeast Asia due to persistent socioeconomic and cultural factors[7,8].

In Indonesia, early marriage remains a persistent challenge for adolescent health and human development. National data indicate that approximately 11% of women aged 20–24 were married before the age of 18[9]. Despite regulatory reforms and national prevention programs, the reduction in early marriage has been relatively slow, particularly in regions where social norms and economic pressures continue to support the practice[10,11]. South Sulawesi is among the provinces where early marriage remains relatively common, reflecting the interaction of socioeconomic vulnerability, cultural expectations, and limited access to adolescent reproductive health education[12].

At the local level, Gowa Regency represents one of the districts where early marriage continues to affect adolescents. Reports from local authorities indicate that cases of early marriage increased during the COVID-19 pandemic, largely due to economic hardship, school disruptions, and reduced access to adolescent health services[13,14]. Previous studies conducted in the Borongloe area of Bontomarannu Subdistrict have also shown that early marriage among adolescents is associated with low educational attainment and an increased risk of adverse child health outcomes, including stunting[15,16]. These findings underscore the need to strengthen preventive strategies aimed at adolescents before marriage.

Educational interventions are widely recognized as a key strategy for preventing early marriage by improving adolescents' knowledge and decision-making capacity regarding reproductive health and life planning[17]. However, many existing educational programs rely heavily on lecture-based approaches that position

ISSN : 1907-8153 (Print)
e-ISSN : 2549-0567 (Online)

adolescents as passive recipients of information. Several studies have reported that such approaches may have limited effectiveness in improving adolescents' engagement, critical thinking, and long-term retention of health information[18,19]. Various interactive educational strategies have been introduced to improve adolescent health knowledge. However, participatory learning approaches that actively engage adolescents in constructing knowledge may offer greater opportunities for meaningful learning and behavioral change.[20].

Child-Centered Learning (CCL) offers a pedagogical approach that may be particularly relevant for adolescents. Rooted in constructivist learning theory, CCL emphasizes active participation, collaborative learning, and problem-solving processes that allow learners to construct knowledge based on their own experiences[21]. For adolescents aged 15–18 years, who are undergoing important cognitive and psychosocial developmental transitions, interactive learning environments can support the development of critical thinking, autonomy, and informed decision-making regarding health behaviors[22]. Unlike conventional lecture-based education, CCL encourages adolescents to actively engage in discussion, reflection, and peer interaction, which may enhance their understanding of complex social issues such as early marriage.

Despite increasing attention to adolescent reproductive health education, several limitations remain in the existing literature. First, many studies focus primarily on the prevalence and determinants of early marriage rather than evaluating the effectiveness of specific educational interventions aimed at adolescents. Second, studies examining health education interventions often rely on traditional or single-method approaches, with limited exploration of participatory learning models such as Child-Centered Learning. Third, evidence regarding the effectiveness of CCL-based health education for improving adolescents' knowledge about early marriage remains limited, particularly in local community settings where social norms strongly influence adolescents' attitudes and decisions.

To the best of our knowledge, no previous study has specifically evaluated a Child-Centered Learning approach as a nursing intervention for improving adolescents' knowledge regarding early marriage in Indonesian community-based settings. This study addresses this gap by applying a participatory learning model grounded in constructivist learning principles and examining its effectiveness within a real-world community context. Furthermore, the study extends the application of Child-Centered Learning beyond formal educational settings by integrating it into community-based adolescent health promotion programs.

## MATERIALS AND METHODS

### Study Design

This study employed a quantitative approach using a quasi-experimental design with a pretest–posttest control group structure. The design was selected to evaluate the effect of a health education intervention on adolescents' knowledge regarding early marriage by comparing knowledge scores between an intervention group and a control group before and after the intervention. This approach allowed the researchers to observe changes in knowledge levels following the intervention while also controlling for baseline differences between groups.

### Study Setting and Participants

The study was conducted in Borongloe Village, Bontomarannu Subdistrict, Gowa Regency, Indonesia, in May 2025. The study population consisted of adolescents aged 15–18 years who resided in the study area and were actively enrolled in school or community youth activities. A total of 100 adolescents participated in the study and were divided into two groups: an intervention group of 50 and a control group of 50. Participants were recruited through coordination with local schools and community youth organizations to ensure adequate representation of adolescents in the target age group.

### Sampling Technique and Group Allocation

Participants were recruited using purposive sampling based on predetermined inclusion and exclusion criteria. Adolescents were considered eligible if they were aged 15–18 years, agreed to participate in the study, and had obtained written consent from their parents or legal guardians. Adolescents who were absent during the intervention sessions or who had diagnosed psychological or cognitive disorders that could interfere with participation were excluded from the study. To reduce potential selection bias inherent in purposive sampling within quasi-experimental designs, baseline equivalence between the intervention and control groups was assessed before the implementation of the intervention. Participants were allocated into groups based on comparable demographic characteristics, including age, sex, and educational level. In addition, pretest knowledge scores were examined to ensure that the two groups had relatively similar baseline knowledge of early marriage before the intervention.

### Intervention

The intervention consisted of health education on early marriage delivered using a Child-Centered Learning (CCL) approach. In this study, CCL served as the primary nursing intervention and pedagogical framework guiding the educational process. The approach emphasized active participation, collaborative learning,


Vol. XXI No. 1 June 2026
https://doi.org/ 10.32382/medkes.v21i1

ISSN : 1907-8153 (Print)
e-ISSN : 2549-0567 (Online)

critical thinking, problem-solving activities, and learner-centered engagement. Educational sessions were designed to encourage adolescents to explore concepts, analyze real-life situations related to early marriage, share perspectives, and construct knowledge through guided learning activities. Small-group discussions, reflection exercises, and interactive learning tasks were incorporated as learning activities within the CCL framework to facilitate meaningful learning experiences.

The intervention was implemented through two educational sessions conducted over two consecutive meetings. Each session lasted approximately 60 minutes and was conducted in small groups of eight to ten adolescents to facilitate active discussion and interaction. The first session focused on introducing the concept of early marriage, including its definition, causes, and contributing social factors. The second session addressed the health, educational, and psychosocial consequences of early marriage as well as strategies for prevention. Learning activities included guided discussions, problem-solving exercises, and reflection activities designed to encourage adolescents to critically analyze the impacts of early marriage on their future.

Educational materials used during the sessions included visual presentation slides, printed informational leaflets, and discussion guides adapted for adolescent audiences. The sessions were facilitated by trained health education facilitators consisting of public health researchers and trained youth volunteers who had previously received orientation on adolescent-friendly communication techniques and the principles of the Child-Centered Learning approach. In contrast, the control group received standard lecture-based health education delivered by a facilitator without structured discussion activities or participatory learning components.

**Instrument Validity and Reliability**

Adolescents' knowledge regarding early marriage was measured using a structured questionnaire developed to assess understanding of the definition, causes, health risks, and social consequences of early marriage. Before the main data collection, the instrument underwent validity and reliability testing through a pilot study involving adolescents with characteristics similar to those of the study participants but who were not included in the final sample.

Content validity was assessed by three experts in public health and adolescent health education who evaluated the relevance and clarity of each item in the questionnaire. Construct validity was examined using the Pearson Product-Moment correlation test, which showed that all questionnaire items had correlation coefficients exceeding the minimum acceptable threshold ($r > 0.30$), indicating that the items were valid measures of adolescents' knowledge. Reliability testing using Cronbach's Alpha demonstrated good internal consistency with a coefficient value of $\alpha = 0.82$, indicating that the questionnaire was reliable for measuring knowledge related to early marriage.

**Data Collection Procedure**

Data collection was conducted in two stages. First, participants in both the intervention and control groups completed a pretest questionnaire to measure baseline knowledge regarding early marriage. After the intervention sessions were completed, participants in both groups were asked to complete a posttest questionnaire using the same instrument. This procedure enabled the researchers to assess changes in adolescents' knowledge following the educational intervention.

**Ethical Considerations**

This study received ethical approval from the Health Research Ethics Committee of the College of Health Science, Maluku Husada, with Ethical Clearance Number: RK.203/KEPK/STIK/XII/2025. Written informed consent was obtained from all participants as well as from their parents or legal guardians before data collection. Participants were informed about the purpose of the study, their voluntary participation, and their right to withdraw at any time without any consequences. Confidentiality and anonymity of participant information were maintained throughout the study.

**Data Analysis**

Data analysis was performed using the Statistical Package for the Social Sciences (SPSS) software version 27. Descriptive statistics were used to summarize participant characteristics and knowledge scores. Before hypothesis testing, the normality of the data distribution was assessed using the Shapiro–Wilk test. Because the data were not normally distributed, non-parametric statistical tests were applied. Differences in knowledge scores between pretest and posttest within each group were analyzed using the Wilcoxon signed-rank test. The Mann–Whitney U test was employed to examine differences in post-intervention knowledge scores between the intervention and control groups. A p-value of less than 0.05 was considered statistically significant.

ISSN : 1907-8153 (Print)
e-ISSN : 2549-0567 (Online)

## RESULTS

**Table 1.** Characteristics of Adolescent Respondents

| Characteristics | Intervention (n=50) | Percentage (%) | Control (n=50) | Percentage (%) |
|---|---|---|---|---|
| Age | | | | |
| 15–16 years | 24 | 48 | 26 | 52 |
| 17–18 years | 26 | 52 | 24 | 48 |
| Sex | | | | |
| Male | 22 | 44 | 21 | 42 |
| Female | 28 | 56 | 29 | 58 |

As presented in Table 1 presents the demographic characteristics of the adolescents who participated in the study. A total of 100 adolescents aged 15–18 years were included, consisting of 50 participants in the intervention group and 50 participants in the control group. In the intervention group, most participants were aged 17–18 years (52%), while 48% were aged 15–16 years. In contrast, the control group showed a slightly higher proportion of adolescents aged 15–16 years (52%) compared with those aged 17–18 years (48%). Regarding sex distribution, females constituted a slightly higher proportion in both groups. In the intervention group, 56% of participants were female, and 44% were male. Similarly, in the control group, females accounted for 58% of the participants, while males represented 42%.

**Table 2.** Distribution of Adolescents' Knowledge Levels Before and After the Intervention

| Knowledge Level | Intervention | | Control | |
|---|---|---|---|---|
| | Pretest (n=50) | Posttest (n=50) | Pretest (n=50) | Posttest (n=50) |
| Good | 0 (0%) | 50 (100%) | 0 (0%) | 21 (42%) |
| Moderate | 25 (50%) | 0 (0%) | 32 (64%) | 27 (54%) |
| Poor | 25 (50%) | 0 (0%) | 18 (36%) | 2 (4%) |

As presented in Table 2, at baseline, none of the adolescents in either the intervention or control group was classified as having good knowledge. In the intervention group, 50% of participants demonstrated moderate knowledge, while the remaining 50% were categorized as having poor knowledge. A similar pattern was observed in the control group, where the majority of adolescents had moderate knowledge (64%), while the remaining participants were categorized as having poor knowledge (36%).

Following the intervention, notable changes were observed in the intervention group. All adolescents were classified in the good knowledge category in the posttest assessment. This shift indicates a substantial improvement in knowledge levels after participation in the child-centered learning–based health education sessions. In contrast, the control group showed more modest improvements. In the posttest results, 42% of adolescents were categorized as having good knowledge, while the majority remained in the moderate category (54%), and a small proportion continued to have poor knowledge (4%). These findings suggest that adolescents who received health education through the Child-Centered Learning approach demonstrated a greater shift toward higher knowledge categories compared with those who received standard lecture-based education

**Table 3.** Normality Test of Pretest and Posttest Scores in the Intervention and Control Groups (n = 50)

| Variable | Shapiro–Wilk Statistic | n | p-value |
|---|---|---|---|
| Intervention Group Pretest | 0.879 | 50 | $p < 0.001$ |
| Intervention Group Posttest | 0.861 | 50 | $p < 0.001$ |

ISSN : 1907-8153 (Print)
e-ISSN : 2549-0567 (Online)

| Variable | Shapiro–Wilk Statistic | n | p-value |
|---|---|---|---|
| Control Group Pretest | 0.842 | 50 | p < 0.001 |
| Control Group Posttest | 0.891 | 50 | p < 0.001 |

As presented in Table 3, the normality of the knowledge score distribution was assessed using the Shapiro–Wilk test. All variables, including pretest and posttest scores in both the intervention and control groups, showed significance values of p < 0.001. These results indicate that the distribution of knowledge scores significantly deviated from normality. Since the assumption of normal distribution was not met, non-parametric statistical tests were applied in the subsequent analyses to compare knowledge scores within and between groups. The use of non-parametric methods is appropriate for handling non-normally distributed data and provides more robust statistical inference for this dataset.

**Table 4.** Analysis of Differences in Knowledge Before and After Intervention in the Intervention Group (n=50) and Control Group (n=50)

| Group | | Mean | SD | Median | p-value |
|---|---|---|---|---|---|
| Intervention | Before | 58,44 | 4.477 | 60 | p < 0.000 |
| | After | 87,00 | 4.738 | 85 | |
| Control | Before | 58,00 | 5,345 | 60 | |
| | After | 75,36 | 5.126 | 75 | |

Wilcoxon Signed-Rank Test

As presented in Table 4, the results of the Wilcoxon Signed-Rank Test showed that all 50 respondents (100%) in the intervention group experienced an increase in knowledge scores after receiving the CCL-based health education. This improvement was reflected in higher mean and median values following the intervention. The post-intervention mean score in the intervention group was 87.00, compared with 75.36 in the control group. Similarly, the median score in the intervention group increased from 60 before the intervention to 85 after the intervention, whereas in the control group, the median score increased from 60 to 75. These findings indicate a statistically significant difference in knowledge levels between the intervention and control groups before and after the educational intervention, demonstrating that the Child-Centered Learning (CCL) approach was more effective in improving adolescents' knowledge regarding early marriage compared with conventional lecture-based education.

These results indicate that none of the respondents experienced a decline in knowledge scores following the intervention, and the observed improvements were consistently distributed across participants. The Wilcoxon signed-rank test yielded a p-value of < 0.001, which was below the significance threshold of 0.05. This finding confirms that the Child-Centered Learning approach had a statistically significant effect on improving adolescents' knowledge regarding early marriage.

**Table 5.** Analysis of Differences in Knowledge of Adolescents in the Intervention Group (n=50) and Control Group (n=50) after Education

| Group | Mean | Median | Standard Deviasi | Minimum-Maksimum | p-value |
|---|---|---|---|---|---|
| Intervention | 28,56 | 30 | 6,469 | 15-40 | p < 0.000 |
| Control | 17,36 | 20 | 6,333 | 0-30 | |

*Mann-Whitney U Test*

As presented in Table 5, the Mann–Whitney U test comparing knowledge levels between the intervention and control groups indicated a greater mean difference in the intervention group (28.56) than in the control group (17.36). This finding indicates that the magnitude of improvement in knowledge was substantially higher among participants who received the intervention. The Mann–Whitney U test showed a statistically significant difference in knowledge improvement between the intervention and control groups (p < 0.001). Since the p-value was below the established significance threshold of 0.05, these results confirm that the child-centered learning–based health education intervention was more effective in improving adolescents' knowledge regarding early marriage compared to the standard lecture-based method.


Vol. XXI No. 1 June 2026
https://doi.org/ 10.32382/medkes.v21i1

ISSN : 1907-8153 (Print)
e-ISSN : 2549-0567 (Online)

## DISCUSSION

### Effect of Health Education Using a Child-Centered Learning Approach on Adolescents' Knowledge of Early Marriage

The findings of this study indicate that adolescents who received health education through a Child-Centered Learning (CCL) approach demonstrated a greater improvement in knowledge regarding early marriage compared with those who received conventional lecture-based education. These results suggest that participatory learning strategies may be more effective in facilitating knowledge acquisition among adolescents than traditional one-way information delivery[23]. However, the interpretation of these findings should be approached cautiously, considering the quasi-experimental design and the contextual factors that may have influenced participants' responses[24].

One possible explanation for the stronger improvement observed in the intervention group relates to the participatory nature of the CCL approach, which encourages adolescents to actively engage in the learning process through discussion, collaboration, and reflection[25]. Educational theories rooted in social constructivism emphasize that knowledge is more effectively constructed when learners actively engage in discussion, connect new information with prior experiences, and collaboratively construct meaning through the learning process. For topics such as early marriage, which involve social norms, family expectations, and future life planning, participatory dialogue may help adolescents critically examine prevailing beliefs rather than merely receiving information passively[26].

Previous studies have shown that interactive and learner-centered educational approaches, including collaborative learning, group discussions, and problem-based learning, can significantly enhance adolescents' understanding of reproductive health issues. Nevertheless, not all studies report equally strong effects[27]. Some research has found that knowledge improvements from participatory methods may vary depending on facilitator competence, cultural context, and adolescents' baseline knowledge levels[28]. Therefore, while the present findings support the potential value of participatory approaches, they should be interpreted as context-specific evidence rather than universal proof of effectiveness.

An additional aspect that warrants consideration is the very high post-test knowledge level observed in the intervention group, where all participants were categorized as having good knowledge[29]. Although this result may reflect substantial learning gains, several methodological factors could also contribute to this pattern. For example, the questionnaire used to assess knowledge may have been relatively easy for participants after exposure to the learning materials[30]. Another possibility is the Hawthorne effect, in which participants modify their responses because they are aware that they are part of an intervention study. These factors should be considered when interpreting the magnitude of the observed effect[31].

### Effect of Lecture-Based Education on Adolescents' Knowledge

In contrast, adolescents in the control group who received lecture-based health education showed more limited improvements in knowledge. Although some increase in knowledge scores was observed, the changes were relatively modest compared with those seen in the intervention group[32]. Lecture-based education typically involves one-directional communication, where participants act primarily as passive recipients of information. While this approach can be useful for delivering basic knowledge efficiently, it may provide fewer opportunities for adolescents to ask questions, share experiences, or critically reflect on the information presented[33]. For complex social topics such as early marriage, which are often influenced by family expectations and cultural traditions, the absence of interactive dialogue may limit deeper understanding[34].

Previous research on adolescent health education has similarly suggested that lecture methods alone may be less effective in promoting sustained understanding unless they are combined with participatory activities[35]. Nonetheless, lectures remain widely used in school and community settings because they are relatively easy to implement and require fewer resources[36]. Therefore, rather than dismissing lecture methods entirely, future interventions may benefit from hybrid educational models that combine structured information delivery with interactive learning elements.

### Cultural Context and the Role of Participatory Learning

The effectiveness of the CCL approach observed in this study may also be related to the socio-cultural context of Gowa Regency, where social norms surrounding early marriage remain influential. In communities where early marriage is socially accepted or normalized, adolescents may have limited opportunities to openly discuss the topic within formal educational settings[37]. Participatory learning environments may facilitate open dialogue, allowing adolescents to explore sensitive issues, consider multiple perspectives, and critically evaluate prevailing beliefs within a supportive learning context[38]. In such contexts, active engagement in discussion and reflection may help adolescents process information more critically and connect it with their aspirations and future life planning. However, it is important to acknowledge that this study did not directly measure cultural attitudes

ISSN : 1907-8153 (Print)
e-ISSN : 2549-0567 (Online)

or normative beliefs. Therefore, while participatory learning may have contributed to increased engagement, the mechanisms through which it influences knowledge and perceptions require further investigation[39].

**Integrated Methodological Considerations**

Several methodological considerations should be taken into account when interpreting these findings. First, the quasi-experimental design without full randomization introduces the possibility of selection bias, as participants were recruited using purposive sampling[8,11,12]. Although efforts were made to ensure comparable baseline characteristics between the intervention and control groups, unmeasured differences may still have influenced the outcomes.

Second, the short follow-up period limits the ability to determine whether the knowledge gains observed after the intervention will be sustained over time or translate into behavioral changes related to early marriage prevention[15]. Educational interventions may produce immediate improvements in knowledge, but long-term impact depends on reinforcement, social support, and broader community influences. Third, the study focused primarily on cognitive outcomes (knowledge) and did not assess changes in attitudes, intentions, or behaviors related to early marriage. Since decisions about marriage are influenced by complex social and familial dynamics, improvements in knowledge alone may not necessarily lead to behavioral change[16]. Finally, the research was conducted within a single geographical setting, which may limit the generalizability of the findings to adolescents in other cultural or socio-economic contexts. Future studies involving more diverse populations would be valuable in confirming whether similar educational approaches are effective in different settings[20].

**Implications and Future Research**

Despite these limitations, the findings suggest that participatory educational strategies such as Child-Centered Learning may hold promise for improving adolescents' knowledge of early marriage. Integrating interactive learning components into reproductive health education programs could potentially enhance adolescents' engagement with sensitive topics that are often shaped by social norms. Future research should employ randomized controlled designs, larger samples, and longer follow-up periods to examine the sustainability of knowledge gains and their potential influence on adolescents' attitudes and behavioral intentions. In addition, qualitative investigations could help explore how cultural norms, learning experiences, and family expectations influence the effectiveness of participatory educational approaches in shaping adolescents' understanding of early marriage.

## CONCLUSION AND RECOMMENDATIONS

This study indicates that health education delivered through a Child-Centered Learning (CCL) approach was associated with a greater short-term increase in adolescents' knowledge regarding early marriage compared with conventional lecture-based education. Adolescents who participated in the interactive sessions demonstrated higher post-intervention knowledge scores, suggesting that participatory learning strategies may facilitate better comprehension of information related to the definition, risks, and social consequences of early marriage.

The findings suggest that child-centered educational approaches that promote active participation, collaborative learning, and reflective engagement may enhance adolescents' immediate knowledge acquisition. However, the results of this study should be interpreted within the scope of the study design, which primarily assessed short-term knowledge outcomes. The study did not assess long-term knowledge retention, changes in attitudes, or behavioral outcomes related to early marriage decisions.

Based on these findings, it may be beneficial for schools and community health programs to incorporate interactive and participatory learning components when delivering reproductive health education to adolescents. For example, structured small-group discussions, facilitated peer dialogue, and problem-based learning activities could be integrated into existing adolescent health promotion programs. Health educators, teachers, and community health workers may consider using these participatory methods alongside conventional information delivery to improve adolescents' engagement with sensitive reproductive health topics.

## AUTHOR'S CONTRIBUTION STATEMENT

Wahyuningsih: Conceptualization, Methodology, Data curation, Writing – Original draft preparation.
Brajakson Siokal: Supervision, Validation, Writing – Reviewing and Editing.
Sainah and Fhirawati: Investigation, Formal analysis, Visualization, Data interpretation.
Wahyuningsih, Setiawan Kasim: Validation, Writing – Reviewing and Editing.

## CONFLICT OF INTERESTS

The authors declare that the research was conducted without any commercial or financial relationships that could be construed as a potential conflict of interest.

ISSN : 1907-8153 (Print)
e-ISSN : 2549-0567 (Online)

**SOURCE OF FUNDING**
The authors received no financial support for the research, authorship, and/or publication of this article

**ACKNOWLEDGEMENT**
The authors gratefully acknowledge Patria Artha University and Indonesian Muslim University for their academic support and resources that made this study possible. The authors also extend their gratitude to colleagues and academic peers who provided valuable insights and constructive feedback during the implementation of the study and the preparation of this manuscript. Their contributions and support greatly assisted in strengthening the quality of this research.

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