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Research Article

THE EFFECT OF USING THE CANVA APPLICATION IN CREATING INTERACTIVE LEARNING MEDIA ON THE INDONESIAN LANGUAGE LEARNING OUTCOMES

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Abstract
Digital transformation has promoted interactive learning media to enhance student engagement and achievement. This study examined the effectiveness of Canva-based interactive media in improving Indonesian Language learning outcomes at SMA Muhammadiyah Pangkajenne, Sidenreng Rappang Regency. A quantitative approach employing a One-Group Pretest - Posttest Design involved 25 eleventh-grade students selected through purposive sampling. Data were collected using learning achievement tests before and after the intervention and analyzed through descriptive and inferential statistics. Results indicated improved mean scores following Canva implementation, suggesting its potential to support Indonesian Language learning. The study's novelty lies in investigating Canva as an instructional medium implemented in authentic classroom settings rather than merely as a developed educational product, particularly within an understudied private secondary school context. Canva-based media may facilitate more engaging, visual, and meaningful literacy learning experiences. These findings provide preliminary empirical evidence supporting the integration of accessible digital tools into Indonesian Language instruction at the secondary education level.

Keywords: Canva, Interactive Learning Media, Learning Outcomes, Indonesian, One Group Pretest Posttest Design.

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INTRODUCTION

The rapid development of information and communication technology has transformed educational practices by encouraging a shift from conventional teacher-centered instruction toward more student-centered learning environments. This transformation requires teachers not only to possess strong pedagogical and subject-matter knowledge but also to develop technological competence in designing learning experiences that are active, innovative, collaborative, and meaningful (Afonso et al., 2025; Erwin et al., 2026).

In this context, digital learning media have become increasingly important as instructional tools that facilitate interaction between teachers, learning materials, and students. Well-designed digital media can support students in understanding abstract concepts, increasing learning attention, and engaging more actively in the learning process. Previous studies have indicated that technology-based learning media can contribute to improving students' motivation, participation, creativity, critical thinking skills, and learning achievement (Almulla, 2023).

Therefore, the use of digital learning media has become one of the important factors in improving the quality of both the learning process and student learning outcomes. Learning media constitute a component with a strategic role in the learning process, functioning as a means of conveying information from educators to students. Media designed to be engaging can help students understand learning concepts more concretely, increase attention to the material being studied, and create more meaningful learning experiences (Dori & Belcher, 2005). Various studies show that the use of technology-based learning media can increase learning motivation, active student participation, critical thinking ability, creativity, and learning outcomes (Zaki et al., 2026). Consequently, the integration of digital learning media has become an essential component in implementing the Merdeka Curriculum and strengthening 21st-century learning practices.

In the context of Indonesian Language learning, the integration of digital learning media has become increasingly relevant because the subject requires students to develop not only conceptual understanding but also communication skills, creativity, critical thinking, and literacy competence. Indonesian Language learning at the secondary school level involves various activities, such as interpreting texts, expressing ideas, analyzing information, and producing written and oral works, which require learning environments that encourage active student involvement (Hanifa et al., 2024). However, many Indonesian Language classrooms still rely on conventional instructional approaches, including teacher explanations and textbook-based activities, which may limit opportunities for interactive learning experiences (Chun et al., 2025).

This condition indicates the need for learning media that can present materials in a more contextual, visual, and engaging manner. Digital-based visual media have been reported to improve students' attention, motivation, and involvement by providing multimedia representations that combine text, images, animation, and audio elements (Rahmawati et al., 2021; Wahyuni et al., 2024). Therefore, the development and utilization of interactive digital media represent an important strategy for improving the quality of Indonesian Language instruction, particularly at the secondary education level (Zhang & Zou, 2022).

One platform that has grown rapidly and is widely used in education is Canva. Canva is a web-based graphic design application that provides various templates for presentations, infographics, instructional videos, posters, worksheets, and other visual media that can be used easily by educators without requiring professional graphic design skills (Ananda et al., 2025). The various features available allow teachers to develop learning media that are more attractive, communicative, and interactive, thereby improving the quality of content delivery. The use of Canva in learning not only makes it easier for teachers to design instructional media but also creates a more engaging learning experience for students (Yulianti et al., 2025). The integration of text, images, illustrations, animation, audio, and video within a single medium

provides a stronger visual stimulus, making it easier for students to understand the concepts being studied. In addition, engaging media can increase students' curiosity, learning motivation, and engagement throughout the learning process.

In the Indonesian Language subject, the use of learning media plays a very important role because the material does not only demand mastery of concepts but also critical thinking ability, communication, creativity, and literacy skills. However, field observations show that Indonesian Language learning at various schools is still dominated by the lecture method with relatively simple media use. This condition causes students to be less active during the learning process, learning motivation to decline, and learning outcomes to fall short of expected levels. Low student engagement in learning is one of the factors influencing low achievement of learning competencies. Based on preliminary observations at SMA Muhammadiyah Pangkajenne, Sidenreng Rappang Regency, the Indonesian Language learning process is still dominated by the use of conventional media, causing learning to tend to proceed in one direction. Most students show relatively low learning interest, are less active in discussions, and still experience difficulty understanding the material delivered by the teacher. The learning evaluation results also show that there are still students who score below the Minimum Completeness Criteria (KKM). This condition indicates the need for innovation in the use of learning media that can increase student engagement while also improving learning outcomes.

Previous studies have demonstrated the potential of Canva-based learning media in supporting educational activities; however, several limitations remain. A considerable number of previous studies have focused primarily on the development, design, and feasibility testing of Canva-based instructional products rather than examining their empirical contribution to students' learning outcomes through classroom implementation (Siska et al., 2024).

Furthermore, existing research has generally been conducted in broad educational contexts or different subject areas, while empirical evidence regarding the implementation of Canva as an interactive learning medium in Indonesian Language learning at the secondary school level remains relatively limited. In particular, studies examining the use of Canva in private school contexts with specific classroom characteristics are still insufficient. Therefore, this study contributes by providing empirical evidence on the implementation of Canva-based interactive learning media and its relationship with students' Indonesian Language learning outcomes among eleventh-grade students at SMA Muhammadiyah Pangkajenne, Sidenreng Rappang Regency. Through a pretest posttest approach, this study seeks to strengthen understanding of how digital visual media can be utilized to support more engaging Indonesian Language learning practices.

Various previous studies have reported that the use of Canva can improve the quality of learning across various subjects through presenting material in a more engaging, interactive, and comprehensible way (Astaño, 2025). Canva-based learning media has been shown to increase learning motivation, creativity, communication skills, and student learning outcomes. However, most studies have focused primarily on developing learning media or measuring the feasibility level of the media produced. Research specifically examining the effect of Canva use on Indonesian Language learning outcomes at the secondary school level remains relatively limited, particularly in the context of private schools in Sidenreng Rappang Regency. Based on this condition, this study holds research novelty by testing the effectiveness of using the Canva application as an interactive learning medium on improving the Indonesian Language learning outcomes of eleventh-grade students at SMA Muhammadiyah Pangkajenne, Sidenreng Rappang Regency. This study is expected to provide an empirical contribution regarding the effectiveness of digital technology use in Indonesian Language learning, as well as serve as a reference for teachers in developing innovative learning media in accordance with the demands of 21st-century learning.

Based on the aforementioned explanation, the objective of this study is to analyze the effect of using the Canva application in creating interactive learning media on the Indonesian

Language learning outcomes of eleventh-grade students at SMA Muhammadiyah Pangkajenne, Sidenreng Rappang Regency. The results of this study are expected to contribute to the development of digital learning media, the improvement of learning process quality, and to serve as a basis for future research on the use of educational technology to improve student learning outcomes.

RESEARCH METHOD

Research Design

This study employed a quantitative approach using a pre-experimental research design with a One-Group Pretest Posttest Design. This design was selected because the study aimed to examine changes in students' learning outcomes before and after the implementation of Canva-based interactive learning media in Indonesian Language learning. In this design, a single group of participants receives a treatment, and measurements are conducted before and after the intervention to identify differences in the observed outcomes (Hirose & Creswell, 2023). The design consists of three stages: administering an initial measurement (pretest), implementing the instructional treatment using Canva-based learning media, and conducting a final measurement (posttest) to determine changes following the treatment (Mara, 2026).

The One-Group Pretest Posttest Design is commonly used in educational research when researchers intend to investigate the potential contribution of an instructional intervention within a natural classroom setting where the use of a control group is not feasible (Fraenkel et al., 2023). Through the comparison of pretest and posttest scores, this design provides empirical information regarding students' learning improvement after participating in technology-supported learning activities. However, because this design does not involve a comparison group, the interpretation of findings is limited to changes observed after the intervention and should be considered as evidence of improvement rather than definitive causal effects (Cohen et al., 2018).

O_1 - X - O_2

Where:

O_1 = Pretest score before the implementation of Canva-based learning media

X = Treatment using Canva as an interactive learning medium

O_2 = Posttest score after the implementation of Canva-based learning media

Research Target/Subject

The participants of this study were eleventh-grade students at SMA Muhammadiyah Pangkajenne, Sidenreng Rappang Regency, Indonesia, during the 2024/2025 academic year. The research population consisted of all eleventh-grade students enrolled in Indonesian Language courses at the school. From this population, 25 students were selected as the research sample using purposive sampling. The selection of participants was based on predetermined considerations, including their involvement in Indonesian Language learning activities and their participation in the implementation of Canva-based interactive learning media.

Purposive sampling was applied because the study required participants who experienced the instructional intervention directly. According to Sugiyono (2022), purposive sampling allows researchers to select samples based on specific characteristics relevant to the objectives of the research. In this study, the selected students represented a classroom context in which conventional learning practices were still dominant, allowing the researchers to examine changes in learning outcomes after the implementation of digital interactive media. The characteristics of the research participants are presented in Table 1.

Table 1. Characteristics of Research Participants

Characteristics	Category	Frequency (n)	Percentage (%)
Educational level	Senior High School (Grade XI)	25	100
School context	SMA Muhammadiyah Pangkajenne	25	100
Location	Sidenreng Rappang Regency, Indonesia	25	100
Subject area	Indonesian Language Learning	25	100
Sampling technique	Purposive Sampling	25	100
Research participation	Students receiving Canva-based learning treatment	25	100

The participants were involved in a classroom-based intervention using Canva as an interactive learning medium. The sample size was determined based on the availability of the selected class and the feasibility of implementing the pre-experimental research design. Although the sample was limited to one classroom, the participants provided relevant empirical information regarding changes in Indonesian Language learning outcomes after the integration of Canva-based instructional media. Therefore, the findings should be interpreted within the specific educational context of the study rather than generalized to all secondary school students.

Research Procedure

The research procedure was conducted through several systematic stages, including preparation, implementation of Canva-based learning media, and evaluation of students' learning outcomes. The study was carried out at SMA Muhammadiyah Pangkajenne, Sidenreng Rappang Regency, Indonesia, during the 2024/2025 academic year. The research location was selected based on preliminary observations indicating that Indonesian Language learning activities were still predominantly conducted through conventional instructional methods with limited utilization of interactive digital media.

In the preparation stage, the researchers conducted initial observations, identified learning problems, prepared instructional materials, developed Canva-based interactive learning media, and designed the learning outcome test instrument. The Canva media was developed by integrating learning content with visual elements, including text, images, illustrations, and interactive presentation components, to support students' understanding of Indonesian Language materials. The preparation stage also involved coordination with the subject teacher to ensure that the learning activities were aligned with the curriculum objectives and classroom conditions.

In the implementation stage, students were first administered a pretest to measure their initial Indonesian Language learning outcomes before receiving the treatment. Subsequently, the learning process was conducted using Canva-based interactive learning media as the instructional treatment. During the learning activities, students were exposed to learning materials presented through Canva-supported visual media designed to encourage attention, participation, and interaction. After completing the learning activities, students were administered a posttest using the same assessment instrument to identify changes in their learning outcomes.

In the evaluation stage, the collected pretest and posttest data were analyzed to determine differences in students' learning outcomes before and after the implementation of Canva-based learning media. The research procedure followed the principles of educational intervention studies, where systematic planning, implementation, and evaluation are required to examine changes resulting from instructional innovations (Creswell & Creswell, 2023; Fraenkel et al., 2023). The overall research procedure is presented in the following stages:

Table 2. Research Procedure

Stage	Activities	Research Output
Preparation	Conducting preliminary observation, preparing learning materials, developing Canva-based media, preparing instruments, and coordinating with teachers	Ready-to-use learning media and research instruments
Pretest	Measuring students' initial Indonesian Language learning outcomes before treatment	Initial learning outcome data
Implementation	Conducting Indonesian Language learning using Canva-based interactive media	Students' learning experience through digital media intervention
Posttest	Measuring students' learning outcomes after treatment	Final learning outcome data
Data Analysis	Comparing pretest and posttest results using descriptive statistical analysis	Evidence of changes in students' learning outcomes

This procedure enabled the researchers to systematically examine changes in students' Indonesian Language learning outcomes following the integration of Canva as an interactive learning medium. However, because the study employed a pre-experimental design without a control group, the findings should be interpreted as evidence of improvement following the intervention rather than absolute proof of causal effectiveness.

Instruments, and Data Collection Techniques

The instrument used in this study was a learning outcome test designed to measure students' achievement in Indonesian Language learning before and after the implementation of Canva-based interactive learning media. The test consisted of 30 multiple-choice items developed based on the Indonesian Language learning competencies for eleventh-grade students. The items were designed to measure students' cognitive understanding of the learning materials delivered during the instructional process. In addition to the learning outcome test, documentation techniques were employed to collect supporting information related to the research implementation, including school profiles, student data, learning materials, and research activity documentation.

The development of the learning outcome instrument followed several stages. First, the researchers identified the relevant learning competencies and indicators based on the curriculum objectives. Second, test items were constructed according to the selected indicators and adjusted to the characteristics of eleventh-grade students. Third, the instrument was reviewed to ensure that the questions were relevant to the research objectives and appropriate for measuring students' learning outcomes. According to Creswell and Creswell (2023), research instruments in quantitative studies should be systematically developed to ensure that the collected data accurately represent the variables being investigated.

Data collection was conducted through two main techniques: testing and documentation. The test technique was conducted twice, namely before and after the implementation of Canva-based interactive learning media. The pretest was administered to identify students' initial learning outcomes, while the posttest was conducted after the instructional treatment to identify changes in students' achievement. Meanwhile, documentation was used as complementary data to support information regarding the research setting, participants, learning activities, and implementation process.

The use of pretest and posttest measurements is consistent with the characteristics of the One-Group Pretest Posttest Design, where changes in participants' performance are examined by comparing scores obtained before and after an intervention (L. Liu, 2025). The combination of test and documentation techniques allowed the researchers to obtain quantitative evidence regarding students' learning outcomes while also providing contextual information regarding the implementation of Canva-based learning activities.

Table 3. Research Instruments and Data Collection Techniques

Instrument/Technique	Description	Purpose	Data Obtained
Learning outcome test	30 multiple-choice items based on Grade XI Indonesian Language competencies	Measuring students' cognitive learning outcomes before and after treatment	Pretest and posttest scores
Pretest	Test administered before Canva-based learning implementation	Identifying students' initial ability	Baseline learning outcome data
Posttest	Test administered after Canva-based learning implementation	Identifying students' learning outcomes after treatment	Final learning outcome data
Documentation	Collection of school data, learning materials, and research implementation records	Supporting research context and implementation evidence	Contextual research information

Data Analysis Technique

The data analysis process was conducted using both descriptive and inferential statistical analyses to examine changes in students' Indonesian Language learning outcomes before and after the implementation of Canva-based interactive learning media. The collected data from the pretest and posttest were first analyzed using descriptive statistics, including mean, standard deviation, minimum score, maximum score, and gain score. These analyses were used to describe the general pattern of students' learning outcomes before and after the instructional treatment.

The improvement in students' learning outcomes was calculated by comparing the differences between pretest and posttest scores. The gain score was used to identify the extent of students' improvement after participating in Canva-based learning activities. According to Creswell and Creswell (2023), descriptive analysis provides an initial understanding of data distribution and research trends before conducting further statistical testing.

Before hypothesis testing, the normality assumption was examined using the Shapiro Wilk test because the number of research participants was fewer than 50 students. The normality test was conducted to determine whether the score distribution met the requirements for parametric analysis. If the data distribution was normal, a paired sample t-test was applied to determine whether there was a statistically significant difference between students' pretest and posttest scores. If the data did not meet the normality assumption, the Wilcoxon signed-rank test was used as a non-parametric alternative (Pallant, 2020).

The effect size was also calculated using Cohen's d to determine the magnitude of improvement resulting from the implementation of Canva-based interactive learning media. Effect size analysis provides additional information beyond statistical significance by showing the practical importance of the observed changes (Cohen, 1988).

All statistical analyses were performed using appropriate statistical software. The significance level was set at $\alpha = 0.05$. The analytical procedure was designed to provide empirical evidence regarding changes in students' learning outcomes following the implementation of Canva as an interactive learning medium. The data analysis procedure is summarized in Table 4.

Table 4. Data Analysis Procedure

Analysis Stage	Statistical Technique	Purpose
Descriptive analysis	Mean, standard deviation, minimum, maximum	Describing students' learning outcomes
Improvement analysis	Gain score calculation	Measuring score improvement after treatment
Normality test	Shapiro Wilk test	Determining data distribution
Hypothesis testing	Paired sample t-test / Wilcoxon signed-rank test	Examining differences between pretest and posttest scores
Effect size analysis	Cohen's d	Determining the magnitude of improvement

RESULTS AND DISCUSSION

This study investigated the changes in Indonesian Language learning outcomes following the implementation of Canva-based interactive learning media among eleventh-grade students at SMA Muhammadiyah Pangkajenne, Sidenreng Rappang Regency. The analysis was conducted based on pretest and posttest measurements obtained from 25 students who participated in the instructional intervention. The comparison between the two measurements was used to identify changes in students' learning achievement after the integration of Canva as a digital learning medium.

The descriptive statistical analysis revealed a substantial improvement in students' Indonesian Language learning outcomes after the implementation of Canva-based interactive learning media. The mean score increased from 64.80 in the pretest to 88.40 in the posttest, representing an average improvement of 23.60 points. The increase indicates that students demonstrated better achievement after participating in learning activities supported by Canva-based visual and interactive materials. Table 5 presents the descriptive statistics of students' learning outcomes before and after the intervention.

Table 5. Descriptive Statistics of Students' Learning Outcomes

Measurement	N	Minimum	Maximum	Mean	Standard Deviation
Pretest	25	50	90	64.80	10.46
Posttest	25	70	100	88.40	9.43

The descriptive results indicate that students experienced improvement not only in average achievement but also in score distribution. Before the intervention, students' scores were concentrated within the moderate achievement category, whereas after the implementation of Canva-based learning activities, most students reached higher achievement levels. This pattern suggests that the use of interactive digital media may provide additional learning support by presenting Indonesian Language materials through more structured and visually accessible representations.

Before conducting hypothesis testing, the normality assumption was examined to determine the appropriate statistical procedure. The Shapiro Wilk test was applied because the number of participants was fewer than 50 students. The results indicated that the pretest and posttest data were normally distributed ($p > .05$), allowing the use of parametric analysis through a paired sample t-test.

Table 6. Normality Test Results

Measurement	Shapiro Wilk Statistic	Sig. (p)	Interpretation
Pretest	0.95	> .05	Normally distributed
Posttest	0.94	> .05	Normally distributed

A paired sample t-test was conducted to determine whether there was a statistically significant difference between students' learning outcomes before and after the implementation of Canva-based interactive learning media. The analysis showed a significant difference

between pretest and posttest scores ($p < .001$). The mean difference of 23.60 points indicates that students achieved higher learning outcomes after participating in Canva-supported Indonesian Language learning.

Table 7. Paired Sample t-Test Results

Comparison	Mean Difference	t-value	df	Sig. (p)
Pretest Posttest	23.60	9.17	24	< .001

To evaluate the practical magnitude of the observed improvement, Cohen's d was calculated. The effect size value indicated a large improvement following the implementation of Canva-based interactive learning media. This finding demonstrates that the difference between pretest and posttest scores was not only statistically significant but also meaningful from an educational perspective.

Table 8. Effect Size of Canva-Based Learning Intervention

Comparison	Cohen's d	Interpretation
Pretest Posttest	1.83	Large effect

Overall, the findings demonstrate that students achieved higher Indonesian Language learning outcomes after participating in Canva-based interactive learning activities. The combination of visual presentation, organized learning content, and interactive digital elements provided a learning environment that supported students' engagement and understanding. Nevertheless, because this study employed a One-Group Pretest Posttest Design without a control group, the findings should be interpreted as evidence of improvement after the intervention within the specific research context rather than as definitive causal evidence.

CONCLUSION

The findings of this study demonstrate that the integration of Canva-based interactive learning media was associated with a substantial improvement in students' Indonesian Language learning outcomes. The increase in students' mean scores from the pretest to the posttest indicates that the use of visually supported digital media provided additional learning support within the classroom environment. This improvement may be attributed to the ability of Canva-based media to organize learning materials through a combination of text, images, illustrations, and interactive visual components, allowing students to process information more effectively. From a pedagogical perspective, multimedia-based learning environments can facilitate deeper understanding by presenting information through multiple representations rather than relying solely on verbal explanations (D. Liu, 2024).

The findings of this study are consistent with previous research emphasizing the positive contribution of digital learning media to student engagement and achievement. Several studies have reported that technology-supported learning environments can increase students' motivation, participation, and cognitive involvement because digital media provide more interactive and meaningful learning experiences (Li et al., 2024; Wong & Hughes, 2023). Similarly, research on Canva-based instructional media has shown that the platform enables teachers to develop visually attractive learning resources that support comprehension and creativity among learners (Safitri & Sari, 2026). The present study extends these findings by demonstrating the implementation of Canva not merely as a design tool but as an instructional medium integrated into Indonesian Language learning activities at the secondary school level.

However, the findings also contribute to an ongoing discussion regarding the role of digital media in improving learning outcomes. Previous studies have argued that technology itself does not automatically produce better academic achievement because the effectiveness of digital tools depends on instructional design, teacher competence, and the alignment between media and learning objectives (Nikolova et al., 2026). In other words, the presence of digital platforms alone is insufficient if they are not integrated with appropriate pedagogical strategies.

The improvement observed in this study suggests that Canva functioned effectively because it was embedded within a structured learning process, where digital visual elements were used to clarify Indonesian Language concepts rather than simply to provide attractive presentations.

Furthermore, this study addresses a limitation identified in previous Canva-related research. Many previous investigations have focused primarily on the development and validation of Canva-based learning products, emphasizing media feasibility and usability rather than examining classroom-based changes in students' learning outcomes. The current study provides empirical evidence regarding the implementation of Canva-based interactive media through a pretest posttest approach in an authentic classroom context. Therefore, the novelty of this research lies not only in the use of Canva as a digital learning platform but also in demonstrating its application within Indonesian Language instruction, particularly in a private secondary school context that has received limited attention in previous studies.

Another important contribution of this study relates to the characteristics of Indonesian Language learning itself. Unlike subjects that primarily emphasize factual knowledge acquisition, Indonesian Language learning requires students to interpret information, construct meaning, communicate ideas, and develop literacy skills. The findings indicate that Canva-based media may support these competencies by transforming learning materials into more accessible visual representations. This perspective strengthens previous arguments that digital literacy development should not be separated from subject-specific learning practices but should be integrated into meaningful classroom activities (Eka Putri et al., 2026).

Nevertheless, the findings should be interpreted critically. Although the statistical improvement between pretest and posttest scores indicates positive changes after the intervention, the One-Group Pretest Posttest Design does not completely eliminate alternative explanations such as maturation effects, learning familiarity, or external influences. Therefore, the findings do not imply that Canva alone determines students' achievement improvement. Instead, the results suggest that Canva-based interactive media represents a promising instructional approach that can support Indonesian Language learning when combined with appropriate pedagogical planning.

Overall, this study contributes to the growing literature on educational technology integration by providing contextual evidence from Indonesian secondary education. The novelty of the study is reflected in three aspects: first, it examines Canva implementation specifically in Indonesian Language learning rather than focusing only on media development; second, it provides empirical evidence from an authentic classroom intervention; and third, it highlights how digital visual media can support literacy-oriented learning in contexts where conventional instructional practices remain dominant. These findings provide practical implications for teachers and educational institutions seeking to integrate accessible digital tools into classroom practices while maintaining pedagogical relevance.

DECLARATION OF AI AND AI ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

AI-assisted tools were used only to support language refinement and improve the clarity of manuscript writing. The authors are fully responsible for the research design, data analysis, interpretation of findings, and final content of this manuscript. AI tools were not involved in generating data or making scientific decisions.

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AUTHOR CONTRIBUTIONS

Author 1: Conceptualization, research design, methodology development, data analysis, and manuscript writing.
Author 2: Literature review, theoretical framework development, data collection, and manuscript revision.
Author 3: Instrument development, data validation, statistical analysis support, and interpretation of findings.
Author 4: Supervision, critical review, editing, and final approval of the manuscript.

DECLARATION OF COMPETING INTEREST

The authors declare that they have no known competing financial interests or personal relationships that could have influenced the research reported in this manuscript.

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