

The Influence of the Participatory Learning Approach (PLA) on Mothers' Knowledge and Awareness in Stunting Prevention: A Quasi-Experimental Study

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ARTICLE INFO	ABSTRACT
<p>Manuscript Received: 04 Nov, 2025 Revised: 05 Jan, 2026 Accepted: 17 Feb, 2026 Date of Publication: 02 Apr, 2026 Volume: 9 Issue: 4 DOI: 10.56338/mpki.v9i4.9090</p>	<p>Introduction: Mothers play a crucial role in ensuring proper family nutrition to prevent stunting. Although various educational and counseling programs have been implemented to improve maternal knowledge, many remain conventional and one-directional, limiting active participation and impact. The Participatory Learning Approach (PLA) has been developed to promote engagement, deeper understanding, and awareness related to stunting prevention.</p> <p>Methods: This study examined the effect of the Participatory Learning Approach on maternal knowledge and awareness of stunting prevention using a quasi experimental design with intervention and control groups. Mothers participated in a community based stunting prevention program, in which the intervention group received participatory learning activities, while the control group received conventional education. Changes in knowledge and awareness were assessed before and after the intervention using appropriate statistical analyses. Unlike previous studies that employed prolonged participatory interventions, this study provides empirical evidence that a short, one day participatory learning program can effectively enhance maternal awareness of stunting prevention in a community based setting.</p> <p>Results: Most participants had high school education and were married. Knowledge scores increased significantly in the intervention group (12.59 ± 2.76 to 13.67 ± 3.22; $p = 0.001$) and in the control group (14.13 ± 2.65 to 15.43 ± 1.73; $p = 0.002$), with Independent t-tests indicated no statistically significant difference in knowledge gains between the intervention and control groups, although the participatory approach demonstrated meaningful improvements in maternal awareness. Maternal awareness of prenatal check-ups rose from 66.6% to 88.8%, and all participants acknowledged the importance of exclusive breastfeeding and dietary diversity after PLA.</p> <p>Conclusion: This study demonstrates that a short duration, community based Participatory Learning Approach (PLA) can effectively enhance maternal knowledge and, more importantly, maternal awareness related to stunting prevention. Although knowledge gains were comparable between participatory and conventional education, PLA showed added value in strengthening awareness of key preventive practices, including antenatal care, exclusive breastfeeding, and dietary diversity. These findings provide preliminary evidence that even a one day participatory learning intervention can serve as a feasible and contextually appropriate strategy for community based stunting prevention programs in resource-limited settings.</p>
KEYWORDS	
<p>Maternal Awareness; Knowledge; Participatory Learning; Stunting</p>	

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INTRODUCTION

Stunting remains one of the most crucial public health issues in Indonesia and continues to be prioritized in national nutrition and human resource development policies. This condition is a form of chronic malnutrition that inhibits children's height growth in early life and has long-term impacts on cognitive development, health status, and future economic productivity. Based on the Indonesian Nutritional Status Survey (SSGI), the national prevalence of stunting in children under five reached 21.6% in 2022, meaning more than 20% of Indonesian children are still affected (1). Although this figure has shown a downward trend in recent years, the prevalence still exceeds global targets and indicates disparities between regions. Globally, stunting is closely linked to poverty, low food security, suboptimal maternal and child nutritional intake, and various other social determinants and health factors (2). In Indonesia, the Ministry of Villages and Human Resources has highlighted the multidimensional factors that contribute to stunting, including inadequate nutritional care practices and limited access to and quality of health services for pregnant women, such as Antenatal Care (ANC) and Postnatal Care (PNC). This problem is closely related to mothers' low level of knowledge regarding stunting prevention efforts and the suboptimal provision of nutrition education during pregnancy. Several previous studies have shown that maternal lack of knowledge negatively impacts daily caregiving behavior, resulting in attitudes that are less supportive of stunting prevention practices, particularly regarding feeding and child care (3). These suboptimal parenting practices are evident in various behaviors, such as lack of attention to the mother's health during pregnancy, insufficient intake of nutritious food, not providing exclusive breastfeeding to babies aged 0–6 months (4), choosing inappropriate types of food, and providing inadequate complementary foods for children (5).

A mother's ability to implement optimal nutritional care is greatly influenced by her level of knowledge and experience regarding nutrition. This knowledge forms the basis for making informed decisions and raising awareness about preventing stunting. Empirical evidence shows that mothers with higher levels of education tend to have children with better nutritional status, as they generally have a better understanding of how to maintain health and implement stunting prevention efforts (6). Furthermore, maternal education plays a role in determining the quality and balance of food intake and sanitation practices (7). While several studies have found a relationship between maternal knowledge and nutritional care practices, these studies also indicate that the influence of knowledge alone is often not as strong as the impact of a mother's formal education (8). To reduce the knowledge gap among mothers, various health counseling and education programs have been implemented through integrated health posts (Posyandu) and other health care facilities. Furthermore, technological advances have expanded access for mothers and expectant mothers to information about nutrition and health. However, despite the availability of these interventions, stunting rates remain high, indicating that the current educational approach is not yet fully effective.

The majority of programs still rely on one-way information delivery and lack structured evaluation of learning outcomes, feedback systems, or levels of active participant participation. This situation indicates a significant research gap regarding the effectiveness of more interactive and participatory learning approaches in improving mothers' knowledge, attitudes, and awareness of stunting prevention efforts. One educational strategy that emphasizes active participant involvement is the Participatory Learning Approach (PLA), which is student-oriented and encourages interaction, discussion, and collaborative problem-solving. This approach has been proven to increase student satisfaction, participation, and learning outcomes in various academic fields (9). In the educational context, the application of participatory learning techniques has also shown significant improvements in post test results compared to conventional learning methods (10,11). In the realm of health education, participatory approaches are increasingly seen as important in increasing program effectiveness and encouraging behavioral change (12). However, empirical evidence specifically assessing the application of Participatory Learning Approaches (PLA) to stunting prevention education for mothers in Indonesia is still relatively limited. Therefore, this study seeks to bridge this gap through the implementation of a participatory based health education intervention packaged in the 3S Learning Course (One Day Stunting Awareness / One Day Stunting Awareness Program).

Although participatory learning approaches have been widely implemented in maternal and child health programs, most existing studies have focused on prolonged, multi session interventions and long term group based activities. Evidence on the effectiveness of short duration participatory learning interventions, particularly in community-based stunting prevention programs in Indonesia, remains limited. Furthermore, previous research has largely emphasized knowledge outcomes, with little attention paid to maternal awareness as a crucial precursor to

behavior change. To address this gap, this study evaluated the effectiveness of a one-day community-based Participatory Learning Approach implemented through the Stunting Awareness Day (3S) program. This study contributes to the literature by providing empirical evidence that a short-term participatory intervention can produce knowledge gains comparable to conventional educational methods, while also having a more significant impact on maternal awareness of key stunting prevention practices. By emphasizing feasibility, participant engagement, and awareness building, this study offers practical implications for optimizing maternal education strategies in resource limited communities. Furthermore, this study provides preliminary evidence supporting the potential and feasibility of implementing short term participatory learning interventions for stunting prevention in resource limited settings.

METHODS

This research employs a structured and systematically planned approach to ensure the reliability and validity of the results. The methodological components are as follows:

Research Type and Design

This study employed a quasi-experimental design with a pre-test and post-test control group model to evaluate the effect of the Participatory Learning Approach (PLA) on mothers' knowledge and awareness regarding stunting prevention. A quasi-experimental design was chosen because random assignment of participants is not feasible in the context of community-based education, where engagement is determined by voluntary attendance, time availability, and ethical considerations regarding the provision or delay of health education interventions. This design allowed researchers to compare outcomes between the intervention and control groups and assess changes in each group from before to after the intervention. The use of pre-test and post-test measures also enhanced the study's internal validity by helping to control for initial differences in knowledge and awareness levels before the intervention.

Participants were allocated to either the intervention or control group based on their attendance and willingness to participate in the One Day of Stunting Awareness (3S) program. The intervention group participated in a one-day educational program delivered through a Participatory Learning Approach, including interactive discussions, presentations, and small-group demonstrations. Meanwhile, the control group received instruction using a conventional lecture method containing similar material but without the participatory elements. Data were collected before and after the intervention to evaluate changes in knowledge and awareness regarding stunting prevention. While this quasi-experimental design is relevant for program evaluation in real world contexts, several limitations warrant consideration. The lack of randomization potentially introduces selection bias and limits the study's ability to comprehensively control for confounding variables. Furthermore, differences in the number of participants between groups and the use of convenience sampling techniques may impact the generalizability of the study results.

These limitations were minimized by applying uniform inclusion criteria to both groups, using standardized measurement instruments, and conducting appropriate and robust statistical analyses for differences in sample size. Nevertheless, the study findings still require cautious interpretation, and further research using a randomized controlled trial design is recommended to strengthen the validity of causal inferences. The differences in initial knowledge scores between groups likely reflect selection bias, a characteristic of quasi-experimental designs. Nevertheless, pre-post change analysis and fixed effect size calculations were used to assess learning improvement in each group.

Population and Sample

The study population consisted of mothers and expectant mothers living in Payah Pasir Village, Medan Marelan District, Deli Serdang Regency. A total of 50 participants were recruited using a simple random sampling method (convenience sampling), consisting of 27 participants in the intervention group and 23 participants in the control group. Group allocation was based on participants' availability and willingness to participate in the One Day Awareness of Stunting (3S) program. The use of simple random sampling and unequal group sizes may introduce selection bias and limit external validity, as participants may differ in motivation and health awareness. Therefore, findings should be interpreted with caution and especially generalizable to similar community-based settings. Despite these limitations, both groups met the minimum sample size requirements, and independent t-tests robust to unequal

group sizes with appropriate assumptions were applied. Future studies using probability sampling and randomization are recommended to improve generalizability.

Research Location

This research was conducted in Payah Pasir Village, Medan Marelan District, Deli Serdang Regency, North Sumatra, Indonesia. The location was selected purposively, considering the high stunting rate and the urgent need to raise public awareness regarding stunting prevention efforts. Payah Pasir Village is a semi urban area, where mothers and expectant mothers actively participate in various public health programs.

Instrumentation or Tools

The instrument used to assess respondents' knowledge was a Multiple-Choice Questions (MCQ) test covering topics such as stunting and maternal nutritional care practices. This test was designed to measure mothers' understanding after receiving educational materials on nutritional care patterns. It was administered twice: before the learning (pretest) and after the learning (posttest). The researchers developed 30 MCQ questions. The instrument's content validity was determined through an expert judgment process involving two nutrition experts and one public health expert. They assessed each item based on relevance, clarity, and appropriateness to the research objectives. Based on the feedback provided, several questions were revised to improve wording clarity and contextual appropriateness. The instrument's reliability was tested using Cronbach's alpha coefficient and yielded an α value of 0.82, indicating a good level of internal consistency.

Maternal awareness levels were measured using a questionnaire designed to evaluate attitudes and understanding regarding stunting prevention, adapted from the Stunting and Prevention Study Guide (13). This instrument also underwent content validity testing by experts and demonstrated a good level of reliability with a Cronbach's alpha value of $\alpha = 0.85$. Data analysis was performed using univariate analysis to describe respondent characteristics, and bivariate analysis using paired t-tests and independent t-tests. To control for initial differences between groups and improve the accuracy of the analysis results, an Analysis of Covariance (ANCOVA) was also performed with post-test scores as the dependent variable and pre-test scores as the covariate.

Data Collection Procedure

Data collection was conducted using a quasi-experimental design using a pre-test and post-test approach. The study participants consisted of mothers and expectant mothers recruited by community health cadres in the study area. Before data collection began, all participants received an explanation of the study's objectives and procedures and were asked to provide written informed consent. Initially, participants completed a pre-test, which included multiple-choice questions (MCQs) to measure their knowledge and a questionnaire to assess their awareness of stunting prevention. Following the pre-test, the intervention group participated in an educational program based on the Participatory Learning Approach (PLA), which actively engaged participants through group discussions, problem-solving activities, and interactive learning sessions focused on stunting prevention. Meanwhile, the control group received standard health education as typically provided in public health facilities. After the intervention was completed, both groups received a post-test using the same MCQ and awareness questionnaire to assess changes in knowledge and awareness levels. To ensure data quality, all research instruments were validated by experts before use. Data were collected within a predetermined timeframe and then processed for further statistical analysis.

Data Analysis

Inferential analysis was conducted using a paired t-test to assess changes in each group and an independent t-test to compare results between the intervention and control groups. Prior to applying parametric tests, assumptions of normality and homogeneity of variance were first tested. The normality of data distribution was tested using the Shapiro–Wilk test, while equality of variance between groups was analyzed using the Levene's test. The test results indicated that the data met the assumptions required for parametric analysis ($p > 0.05$), thus the use of the paired t-test and independent t-test was deemed appropriate. These statistical methods were chosen because they are effective for comparing means between groups despite different sample sizes, as long as the basic assumptions are met. Furthermore, effect sizes were calculated using Cohen's d to estimate the magnitude of knowledge improvement in

each group. Even if slight deviations from normality were found, the t-test was still considered robust given the adequate sample size and relatively symmetrical data distribution.

Ethical Approval

The authors have fully adhered to ethical standards, including those related to plagiarism, informed consent, infringement, multiple publications and/or submissions, redundancy, and other relevant issues. This research has obtained ethical approval with number: 125/EC/KEPK-FKUISU/1/2021; approval date: January 21, 2021

RESULTS

Both groups experienced a statistically significant increase in knowledge scores after the intervention. In the intervention group, the average knowledge score increased from 12.59 ± 2.76 to 13.67 ± 3.22 , with a Cohen's *d* of 0.36, indicating a small to medium effect size. Meanwhile, in the control group, the knowledge score increased from 14.13 ± 2.65 to 15.43 ± 1.73 , with a Cohen's *d* of 0.58, indicating a medium effect size. These results indicate that both learning methods resulted in significant increases in mothers' knowledge. Analysis using an independent t-test showed no significant difference in the magnitude of knowledge increase between the intervention and control groups ($p = 0.65$), indicating that overall learning outcomes were relatively equal between the two groups. Nevertheless, the effect size in the PLA group indicates that the participatory learning approach can produce equivalent educational impacts while emphasizing the involvement and active participation of participants. Findings related to maternal awareness further emphasize the practical significance of the PLA intervention. Awareness of the importance of prenatal checkups increased from 66.6% at baseline to 88.8% after the intervention, a 22.2 percentage point increase. Understanding of the importance of exclusive breastfeeding also increased from 85.2% to 100%, with no further responses indicating disagreement. Furthermore, awareness of the importance of dietary diversity increased from 96.3% to full agreement (100%) post-intervention. These changes demonstrate the strong practical impact of the participatory learning process in raising awareness and shaping mothers' attitudes toward stunting prevention efforts.

Table 1. Distribution of respondents based on education level, occupation and marital status of the intervention group and control group in Payah Pasir village, Medan Marelan District, Deli Serdang Regency

Respondent Characteristics	Intervention Group		Control Group	
	N	%	N	%
Education				
Elementary School	8	29.6	8	34.8
Junior High School	4	14.8	4	17.4
Senior High School	12	44.4	11	47.8
Higher Education	3	11.1		
Occupation				
Unemployed	5	18.5	7	30
Housewife	15	55.6	1	4.3
Farmer	3	11.1	5	21.7
Civil Servant	3	11.1	10	43.5
Entrepreneur	1	3.7	0	0
Marital Status				
Married	20	74.1	17	73.9
Unmarried	7	25.9	5	21.7
Widow	0	0	1	4.3

Based on the table, the majority of respondents (mothers and expectant mothers) in Bentunai Village were high school graduates, with 12 (44.4%) in the intervention group and 11 (47.8%) in the control group. The most dominant occupation in both groups was housewife, and the majority of respondents in both groups were married.

Table 2. Analysis of the Participatory Learning Approach on respondents' knowledge improvement in Payah Pasir village, Medan Marelan District, Deli Serdang Regency

Variable	Pre-test (mean ± SD)	Post-test (mean ± SD)	Difference	p-value
Intervention	12,59 ± 2,763	13,67 ± 3,223	3,8	0,001*
Control	14,13 ± 2,651	15,43 ± 1,727	3,4	0,002*

The table shows an increase in average test scores from pre-test to post-test in both groups. The results of the intervention group showed statistically significant improvement ($p < 0.005$).

Table 3. Analysis of the effect of the Participatory Learning Approach in the intervention and control groups

Knowledge of Mothers and Prospective Mothers	Intervention (Mean ± SD)	Group Control (Mean ± SD)	Difference	p-value
Pre-test	12,59 ± 2,763	14,13 ± 2,651	-	0,001*
Post-test	13,67 ± 3,223	15,43 ± 1,727	-	0,002*
Mean pre- and post-test	-	-	0,65	-

The table shows that the results of the independent t-test indicate a significant difference in knowledge levels regarding stunting between the intervention and control groups, both at the pre- and post-test stages. In terms of test scores, the intervention group demonstrated higher learning outcomes than the control group. Furthermore, maternal awareness of the importance of prenatal checkups significantly increased after the implementation of the PLA intervention, from 66.6% at the beginning of the study to 88.8% after the intervention, representing an increase of 22.2 percentage points. This increase reflects the strong practical impact of the participatory learning process in raising maternal awareness.

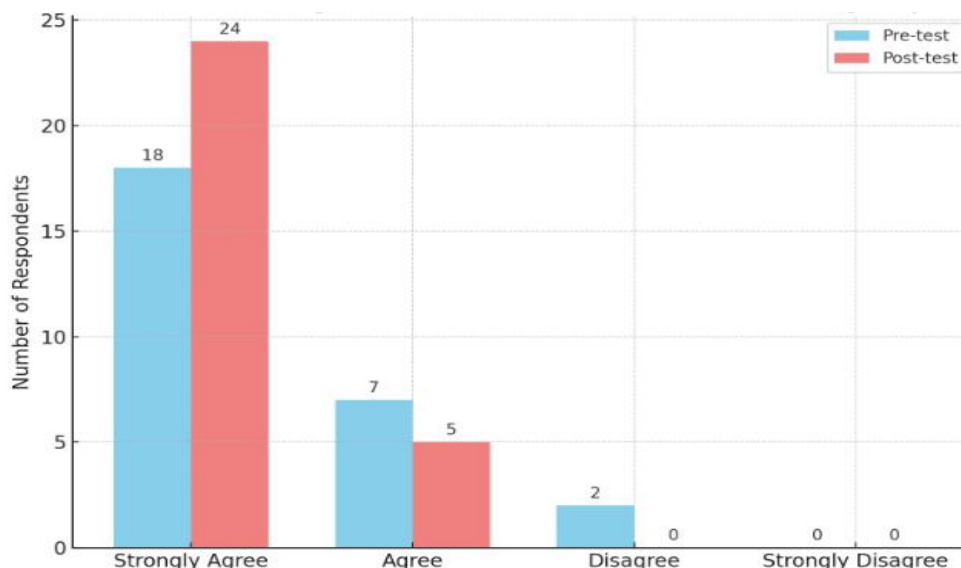


Figure 1. Pre and post test diagram of mothers' awareness regarding pregnancy check-ups

The results of the study showed an increase in awareness among mothers and prospective mothers regarding the importance of pregnancy check-ups as an effort to prevent stunting, from 18 respondents (66.6%) in the pre-test stage to 24 respondents (88.8%) who stated they agreed or strongly agreed in the post-test stage.

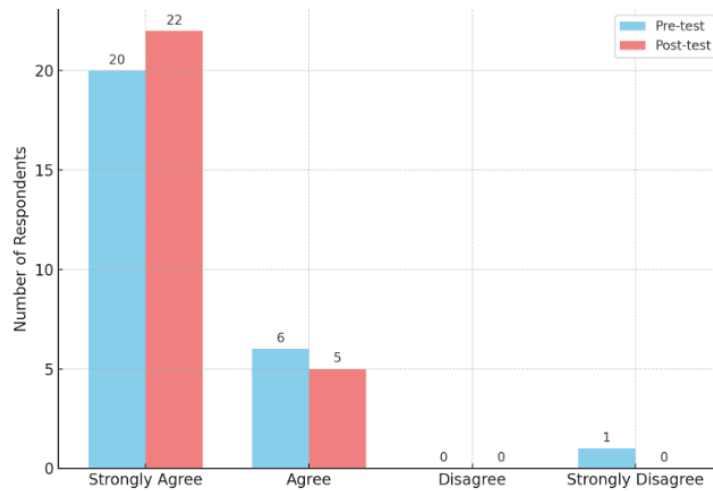


Figure 2. Pre and post test diagram of mothers’ awareness regarding exclusive breastfeeding

The results of the study showed a significant increase in awareness among mothers and expectant mothers regarding the importance of exclusive breastfeeding as a measure to prevent stunting. In the pre-test, 4 respondents (14.8%) disagreed, while in the post-test, all respondents (100%) agreed with the importance of this practice. The overall level of agreement increased from 85.2% at the beginning of the study to 100% after the implementation of the PLA intervention. Inferential analysis using the McNemar test showed that this change was statistically significant ($p < 0.05$), confirming the significant effect of the PLA intervention in increasing mothers' awareness and aligning their attitudes with recommendations for appropriate infant feeding practices.

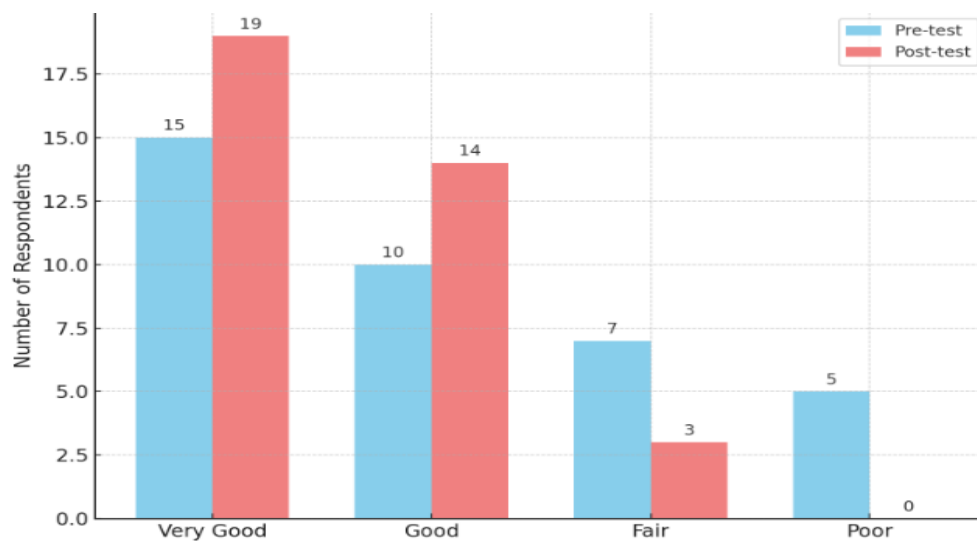


Figure 3. Pre and post test diagram of mothers’ awareness regarding food variation

Furthermore, awareness of the importance of providing a diverse diet for children and families also increased after the intervention. In the pre-test, one respondent (3.7%) disagreed, while in the post-test, all respondents (100%) agreed. The level of agreement regarding the importance of dietary diversity increased from 96.3% at the beginning of the study to 100% after the intervention. Although the initial level of awareness was already high, the McNemar

test showed that the increase was statistically significant ($p < 0.05$). This indicates that the PLA intervention was effective in strengthening positive attitudes and dispelling lingering misconceptions regarding the importance of dietary diversity in stunting prevention.

DISCUSSION

This study shows that the Participatory Learning Approach (PLA) is effective in increasing mothers' knowledge and, more importantly, their awareness regarding stunting prevention. Although both the participatory and conventional groups experienced statistically significant increases in knowledge scores, there was no significant difference between the two groups in terms of the magnitude of the increase in knowledge (14). These results indicate that in the short term, participatory and conventional approaches can have relatively equivalent cognitive impacts, particularly when participants' initial knowledge levels are already in the moderate category (15). However, the PLA intervention demonstrated a significant increase in maternal awareness levels across key prevention areas, such as antenatal care, exclusive breastfeeding, and dietary diversity. These findings indicate that participatory learning has the potential to be more effective in shaping attitudes and raising awareness than simply promoting short term knowledge gains (16,17).

The increase in maternal awareness identified in this study can be understood through the interactive and experiential nature of the Participatory Learning Approach (18). The PLA emphasizes open dialogue, interaction between participants, and collaborative problem-solving, enabling participants to actively process information and relate it to their daily experiences. This mechanism aligns with social learning and experiential learning theories, which emphasize the importance of active engagement in promoting attitude change and internalizing health messages. Previous studies have also shown that participatory learning and action strategies can increase maternal awareness and motivation, although the knowledge gains achieved are relatively equivalent to those achieved with conventional educational methods (19). Furthermore, this study adds to the existing evidence by demonstrating that short-term, community-based participatory interventions can still produce significant increases in awareness, supporting the feasibility of implementing the PLA in resource constrained contexts (20). Several limitations should be considered when interpreting the results of this study. The use of a quasi-experimental design and convenience sampling technique limits the strength of causal inferences and the generalizability of the findings. Furthermore, differences in baseline knowledge scores between groups could potentially influence post-intervention comparisons. The one-day duration of the intervention and the use of self-report measures of awareness also limit the study's ability to draw conclusions regarding long-term behavioral changes. Nevertheless, this study has several important strengths (21). This confirms the practical feasibility and ecological validity of implementing a participatory learning model in an existing public health program. The participation of mothers and expectant mothers further strengthens its relevance in early stunting prevention efforts, while consistent improvements in various awareness indicators demonstrate the pedagogical value of the PLA approach. These findings indicate that participatory methods can complement conventional education by encouraging more active involvement and increasing maternal awareness, which are essential prerequisites for achieving sustainable behavior change in stunting prevention programs (22).

Interpretation of Key Findings

Research findings indicate that the Participatory Learning Approach (PLA) significantly increased mothers' knowledge and awareness regarding stunting prevention. Higher post-test scores in the intervention group indicated that participatory strategies, such as group discussions and practical demonstrations, were effective. Compared to conventional lecture methods, the PLA provided a more interactive and engaging learning environment, strengthening understanding and retention of the material. Increased awareness regarding prenatal checkups, exclusive breastfeeding, and dietary diversity also demonstrated that the PLA contributed to encouraging positive behavioral changes. Overall, even short interventions such as the One Day Awareness of Stunting (3S) program can have a significant impact in strengthening community-based education and supporting stunting prevention efforts.

Comparison with Previous Studies

The results of this study align with previous studies showing that participatory learning approaches are effective in increasing maternal knowledge and awareness in health education programs. Previous research, including

that of Doustmohammadian, A., et al. (2022), reported that active engagement through group discussions and live demonstrations significantly strengthened understanding and encouraged positive behavioral changes in the context of maternal and child health (23). However, the results of this study do not entirely align with the findings of Sari et al. (2020). Consistent with several other studies, the implementation of the Participatory Learning Approach (PLA) in this study proved effective in increasing knowledge and awareness regarding stunting prevention (24). Unlike previous studies that used longer intervention durations, this study implemented a short, one day learning program (3S) and still showed positive results. These findings indicate that even short duration participatory interventions can have an effective impact if systematically designed and adapted to the local context. For example, Mamiro et al. (2014) reported that a structured nutrition education package implemented in rural Tanzania significantly improved infant feeding practices, increased nutritional adequacy, and supported overall child growth. (25) Similarly, Nyamasege et al. (2020) found a reduction in stunting prevalence following the implementation of a nutrition education and counseling program for mothers in an informal urban settlement in Nairobi, Kenya. Overall, these findings confirm that context-specific and sustainably implemented educational interventions play a critical role in changing mothers' perceptions and transforming knowledge into improved nutrition practices (26). In general, the findings of this study reinforce the findings of Hall et al. (2018), which highlighted the low level of maternal awareness regarding stunting in Indonesia (27). Furthermore, these findings also underscore the significant potential of community-based nutrition education interventions as reported by Mamiro et al. (2014) and Nyamasege et al. (2020) in bridging the existing knowledge gap and helping break the intergenerational chain of malnutrition.

Limitations

Several limitations should be considered when interpreting the results of this study. The use of a quasi-experimental design and convenience sampling technique limits internal validity and increases the potential for selection bias, thus limiting the ability to draw causal conclusions regarding the effectiveness of the PLA. The relatively small sample size and the study's implementation in a single village also reduced statistical power and limited the generalizability of the findings to a broader population. Furthermore, the one-day intervention duration and the use of self-report instruments limit conclusions about long term behavior change and potentially introduce social desirability bias. These methodological limitations likely contributed to the lack of significant differences between groups. Nevertheless, this study has several important strengths. These findings demonstrate the feasibility of implementing a brief, community based Participatory Learning Approach in resource constrained settings, while enhancing the study's ecological validity. The participatory approach enabled active participant engagement and immediate improvements in maternal knowledge and awareness, providing important insights into early cognitive and attitudinal changes. The participation of mothers and expectant mothers further strengthens the study's relevance for early stunting prevention efforts. Overall, these results provide significant preliminary evidence to support the development of larger-scale, more structured participatory interventions in maternal and child health programs.

Recommendations for Future Research

Future research needs to involve a larger and more diverse sample size to allow for broader generalization of findings across various social and cultural contexts. Furthermore, a longer intervention duration is recommended to evaluate the long-term impact of the Participatory Learning Approach (PLA) on behavioral change in stunting prevention. Researchers are also encouraged to use a mixed methods design that integrates quantitative and qualitative approaches to provide a more comprehensive understanding of participants' learning experiences and barriers to adopting new behaviors. Further studies on the role of community health workers and the use of digital learning platforms are also needed to increase the potential for scalability of the PLA-based program. Overall, future research is expected to optimize participatory learning strategies to make them more effective and sustainable in supporting improvements in maternal and child health.

CONCLUSION

After implementing the Participatory Learning Approach (PLA), mothers and expectant mothers experienced significant improvements in knowledge and awareness regarding stunting prevention, including antenatal checkups, exclusive breastfeeding, complementary feeding practices, and dietary diversity. Both the PLA and conventional

lecture methods demonstrated statistically significant increases in knowledge within each group. However, there was no significant difference in the magnitude of knowledge increase between the two approaches ($p = 0.65$), indicating that both were relatively equally effective in improving short term knowledge. Importantly, the PLA intervention demonstrated a substantial practical impact on improving maternal awareness and attitudes, reflected in consistent and statistically significant increases across all key aspects of stunting prevention. While these improvements did not result in higher knowledge scores compared to conventional educational methods, these findings nonetheless underscore the pedagogical value of PLA in encouraging active participation, engagement, and experiential learning. These characteristics suggest that PLA can be a relevant and contextualized alternative for stunting prevention education at the community level, particularly in settings where participant engagement and awareness raising are key program goals.

AUTHOR CONTRIBUTION STATEMENT

All authors contributed significantly to the completion of this study. Alamsyah Lukito conceived and designed the study, developed the research framework, and supervised the overall research process. Zaim Anshari conducted data collection and performed the statistical analysis. All authors reviewed and approved the final version of the manuscript and agreed to be accountable for all aspects of the work.

CONFLICTS OF INTEREST

The authors confirm that they have no conflicts of interest financial, personal, authorship related or otherwise that could influence this research or its findings as presented in this paper.

DECLARATION OF GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

In the preparation of this manuscript entitled “The Influence of the Participatory Learning Approach (PLA) on Mothers' Knowledge and Awareness in Stunting Prevention”, the authors made limited use of generative artificial intelligence (AI) tools to refine the language, grammar, and overall readability of the text. The utilization of AI was strictly confined to linguistic and formatting assistance; it did not involve the generation of scientific content, data analysis, or conceptual input. The authors take full responsibility for the originality, accuracy, and integrity of the entire manuscript.

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