JPPIPA 11(12) (2025)

Jurnal Penelitian Pendidikan IPA

http://jppipa.unram.ac.id/index.php/jppipa/index

Improving the Knowledge of Mothers of Toddlers and Preschool Children on Early Detection of Child Growth and Development through the *Prona-Kepo* Approach

Mariyani[1*], Ita Herawati[1], Resi Galaupa[1]

[1] Midwifery, Abdi Nusantara College of Health Sciences, Jakarta, Indonesia.

Received: October 15, 2025
Revised: November 29, 2025
Accepted: December 25, 2025
Published: December 31, 2025

Corresponding Author:
Mariyani
merimariyani431@gmail.com

DOI: 10.29303/jppipa.v11i12.13473

Abstract: Hypertension PRONA-KEPO as a solution with an educational and participatory approach. This program integrates the role of Family Development for Toddlers and Preschool Children, which focuses on strengthening family knowledge and integrated health posts that provide basic health services and monitoring of child development to reduce the incidence of stunting. The study used a quasi-experimental design with a non-equivalent control group design. The sample determination used purposive sampling. The results showed that there was a change in knowledge before and after the intervention in the intervention and control groups. In the intervention group, the mean value before the provision of health literacy in the form of augmented reality was 60.8 ± 1.06 and experienced an increase in the mean value to 92.3 ± 0.86, while in the control group, the previous 57.9 ± 0.87 experienced a smaller increase to 80.5 ± 1.04. The results of the Wilcoxon test in the intervention group obtained a p-value = 0.012 < α = 0.05. Meanwhile, in the control group, the p-value obtained was 0.005 > α = 0.05.

Keywords: Knowledge; Mother toddler; Preschool, Detection, Growth and Development

Introduction

The toddler and preschool years are a golden age in child development, crucial for determining their future quality of life (Patimah et al., 2024). During this period, children's brain development and basic skills develop rapidly, making proper stimulation and monitoring crucial (Pibriyanti & Luthfi, 2019). One strategic step to ensure optimal child growth and development is through early detection of potential developmental abnormalities, whether physical, cognitive, social, or emotional (Crotty et al., 2023; Likhar et al., 2022; Nugroho et al., 2021).

Early detection of child growth and development is crucial so that any abnormalities can be identified and addressed appropriately (Bozzatello et al., 2021; Uhlhaas et al., 2023). Unfortunately, maternal awareness and skills in early detection remain low in many regions, particularly in areas with limited access to health and education services, and mothers are still less likely to bring their children for check-ups, particularly immunizations and growth assessments (Permatasari, 2020; Saputri et al., 2024).

The Toddler Family Development Program (BKB) and Integrated Health Posts (Posyandu) are two strategic approaches developed by the government to support optimal child growth and development (Hutagalung & Hermawan, 2021; Islamiyati et al., 2023; Rumapea et al., 2025). BKB focuses on empowering families, particularly mothers, in child care and learning (Noviani et al., 2022; Siregar et al., 2021). Meanwhile, Posyandu provides basic health services, including child growth monitoring and immunization (Apiah et al., 2024; Kusuma, 2022; Soetjiatie et al., 2022). However, the synergy between these two programs is often not fully utilized to improve mothers' skills in early detection of

How to Cite:
Mariyani, M., Herawati, I., & Galaupa, R. (2025). Improving the Knowledge of Mothers of Toddlers and Preschool Children on Early Detection of Child Growth and Development through the Prona-Kepo Approach. *Jurnal Penelitian Pendidikan IPA*, *11*(12), 98–103. https://doi.org/10.29303/jppipa.v11i12.13473

child growth and development (Aprianti & Ramlis, 2024).

Furthermore, mothers' active involvement in Posyandu and BKB activities is often passive. Mothers generally only attend for child weighing, without truly understanding the meaning and function of developmental monitoring. This indicates an urgent need to improve mothers' skills in actively and continuously understanding, recognizing, and monitoring the stages of child growth and development (Idealistiana & Yanuarti, 2024).

By integrating the approaches of these two programs, BKB and Posyandu, it is hoped that synergy will be created that can increase mothers' capacity for early detection. This integrated program can create an empowering learning environment, increase active maternal involvement, and strengthen the role of cadres and health workers in providing targeted guidance. Therefore, research or programs to improve mothers' skills in early detection of child growth and development through the Family Development and Posyandu approaches are highly relevant and urgent. Based on this presentation, the research question is formulated as follows: What is the level of knowledge of mothers of toddlers and preschool children regarding early detection of child growth and development before intervention?

Method

This type of research is quantitative research with a quasi-experimental method using a Non-Equivalent Control Group design (Sugiyono, 2016). This method begins with the development of a combination of family development programs and integrated health posts (Posyandu).

The sample in this study amounted to 50 people (25 people in the intervention group and 25 people in the control group). The inclusion criteria in this study were mothers who had children aged 0–59 months, married couples, living in affordable housing, and were willing to participate in the study. The exclusion criteria were mothers who had children aged 0–59 months with congenital abnormalities or serious illnesses, mothers who did not have an Android-based smartphone, and mothers who were not present during the study.

The dropout criteria were mothers who moved residence during the study and mothers who were not present during the evaluation. In this study, two groups were used, namely the intervention group, which used the family development program and integrated health posts (Posyandu), and the control group, which used the KIA (Maternal and Child Health) book. Subjects were collected during the mother–to–toddler class and during integrated health service posts (Posyandu). Data collection was conducted using a questionnaire, and the intervention used a combination of the family development program and integrated health service posts (Posyandu).

The questionnaire had a minimum score of 0 and a maximum score of 30. The questionnaire was first tested for validity and reliability. Data analysis was conducted using SPSS 25 with the Mann–Whitney U Test and the Wilcoxon Test with a significance level of $\alpha < 0.05$; therefore, H_0 was rejected and H_1 was accepted.

Results and Discussion

This research was conducted on August 2nd – September 2nd, 2025, according to letter number 400.14.5.4/838/Bakesbangspol/2025, in the working area of UPTD Danau Indah Health Center, Bekasi Regency. This type of research is quantitative research with a quasi-experimental method using a Non-Equivalent Control Group design. This method begins with the development of a combination of family development programs and integrated health posts. The sample in this study amounted to 50 people (intervention group of 25 people and sample group of 25 people), the inclusion criteria in this study were mothers who had children aged 0-59 months, married couples, affordable housing and were willing to participate in the study. The exclusion criteria were mothers who had children aged 0-59 months with congenital abnormalities or serious illnesses, mothers who did not have an Android-based smartphone, and mothers who were not present at the time of the study. The dropout criteria were mothers who moved residence during the study and mothers who were not present when the evaluation was carried out. This study used two groups: an intervention group using the family development program and integrated health service posts (Posyandu), and a control group using the Maternal and Child Health (KIA) handbook. The study sample was drawn using purposive sampling.

The next stage was a pretest to assess the knowledge, attitudes, and skills of mothers of toddlers and preschool children regarding early detection of growth and development. Respondents in the intervention group were then given the family development program and integrated health service posts (Posyandu), while the control group received the KIA handbook. After one month of intervention, a posttest was conducted to assess the knowledge, attitudes, and skills of mothers of toddlers and preschool children regarding early detection of growth and development using a questionnaire. The study was scheduled for May–July 2025 in the Jatihbening Community Health Center (Puskesmas) working area.

The results of the study include a description of the characteristics of the respondents and the distribution of knowledge variables in the intervention group and the

control group. To determine the effect of the provision of knowledge and skills improvement for mothers of toddlers and preschool children regarding early detection of child growth and development through the PRONA-KEPO approach, the Mann–Whitney test was used. To compare changes before and after the intervention in the intervention group and the control group, the Wilcoxon test was used because the data distribution test revealed that the data were not normally distributed.

The data obtained from the study results are then presented in a distribution table. Cross-tabulation and systematic data analysis are performed as follows:

Respondent Characteristics Analysis

Table 1 shows that most respondents in the intervention group (48.0%) were aged 31–40 years, while in the control group (64.0%), the majority were aged 21–30 years. The high and low education categories in both the intervention and control groups were 18% and 16%, respectively.

Table 1. Distribution of Respondent Characteristics

Respondent characteristic	Intervention		Control		P Value
	n	%	n	%	
Age					
17-20 years	2	8.0	5	20.0	0.103[a]
21-30 years	11	44.0	16	64.0	
31-40 years	12	48.0	4	16.0	
Mother education					
Low	18	72.0	16	64.0	1.000[a]
High	7	28.0	9	36.0	
Total	25	50.0	25	50.0	

[a]*Chi square* test $p < 0.05$

Table 1 shows the results of statistical tests on all characteristics, indicating no significant differences between age and maternal education in the intervention and control groups ($p > 0.05$), indicating that all characteristics of the study sample were homogeneous. In other words, the results of the study and the intervention provided were not influenced by the characteristics of the study sample.

This bivariate analysis was conducted to examine the relationship between two variables. In this case, the variable being analyzed is the effect of providing knowledge and skills improvement for mothers of toddlers and preschool children regarding early detection of child growth and development through the PRONA-KEPO approach.

Table 2. Changes in Knowledge of Administration in the Intervention and Control Groups

Group	n	Mean ± SD Pengetahuan (mg/dl)		p	Δ	p
		Pre	Post			
Intervention	25	60.8±1.06	92.3±0.86	0.012*	0.2	0.002**
Control	25	57.9±0.87	80.5±1.04	0.051*	0.1	

**Wilcoxon test*; $p < 0.05$

** *Mann Whitney test*; p, 0.05

The data in Table 2 show a change in knowledge before and after in the intervention and control groups. In the intervention group, the mean score before the Augmented Reality Health Literacy program was 60.8 ± 1.06, increasing to 92.3 ± 0.86. Meanwhile, in the control group, the mean score was 57.9 ± 0.87, increasing slightly to 80.5 ± 1.04. The Wilcoxon test for the intervention group yielded a p-value of $0.012 < \alpha = 0.05$. Meanwhile, in the control group, a p-value of $0.005 > \alpha = 0.05$ was obtained. This indicates a difference between the intervention and control groups, thus concluding that the PRONA-KEPO approach to improving the knowledge and skills of mothers of toddlers and preschoolers regarding early detection of child growth and development has an effect.

A comparison of knowledge between the intervention and control groups after the intervention using the Mann–Whitney test showed a p-value of $0.002 < \alpha = 0.05$. This shows that there is an influence of providing knowledge and skills improvement for mothers of toddlers and preschool children regarding early detection of child growth and development through the PRONA-KEPO approach.

Discussion

The research results showed that intervention through the PRONA-KEPO (Friendly Parents Program - Get to Know and Monitor Optimal Child Growth and Development) approach significantly improved mothers' knowledge and skills in early detection of

growth and development in toddlers and preschoolers. Prior to the intervention, most mothers lacked a comprehensive understanding of age-appropriate child development stages and were unable to independently identify signs of developmental delays (Kanniappan et al., 2025; Mountstephean, 2010). This aligns with previous research indicating that low parental stimulation and involvement are among the main causes of delayed detection of developmental problems in children.

After receiving PRONA-KEPO-based education and training, there was a significant increase in both mothers' knowledge and skills. This approach was deemed effective because it not only conveyed theoretical information but also involved hands-on practice, such as simulations of the use of the KPSP (Pre-Screening Questionnaire for Development), demonstrations of age-appropriate stimulation games, and discussions of real-life cases. This active-participatory learning increased mothers' confidence in independently monitoring their children's development at home. Research by Yanti et al. (2022) showed that parental empowerment-based education through early detection training for growth and development using the KPSP (Early Child Development and Developmental Group) media increased the knowledge of toddler mothers by 65% and their independent observation skills for their children's motor and language development. This study confirmed that active parental involvement in the growth and development monitoring process is more effective than the one-way counseling model at integrated health posts (Posyandu). These results reinforce the findings of the current study that the interactive and participatory approach of PRONA-KEPO can encourage mothers to become more confident in conducting child growth and development screenings.

Another study by Dewi et al. (2025) implemented a group-based training program for Stimulation, Detection, and Early Intervention for Growth and Development (SDIDTK) among preschool mothers. The results showed a significant improvement in mothers' cognitive and fine motor skills through simple games at home, with skill scores increasing from 46.7% to 83.3%. The study concluded that delivering education through live simulations and group discussions was more effective than conventional lectures. This aligns with the PRONA-KEPO approach, which uses hands-on practice and mentoring to produce behavioral changes, not just knowledge.

Meanwhile, Mulyani et al. (2020) examined the effectiveness of a digital education module on child development for working mothers. Their results showed that easy access to information through simple and flexible media enabled mothers to more consistently monitor their children's development (Lauricella et al., 2016). Although technology-based, the basic principles applied remained the same: information simplification, active parental involvement, and ongoing monitoring. This aligns with the PRONA-KEPO concept, which simplifies the detection process with a "recognize and monitor" approach, so mothers do not feel burdened in implementing it.

Furthermore, the program's success was also influenced by the delivery of materials, which were presented in a simple and contextual manner, tailored to the conditions of mothers in the field. The use of easy-to-understand language, visual media, and examples of stimulating activities using household tools made the materials easier to implement (Huang, 2005). This supports the theory that empowerment depends not only on providing information but also on the adaptability of educational methods to the characteristics of participants.

These findings indicate that family empowerment-based interventions such as PRONA-KEPO have the potential to be an effective strategy in supporting early detection programs for growth and development at the community level. By increasing the capacity of mothers as caregivers, growth and development monitoring can no longer rely solely on healthcare professionals but can be conducted routinely within the home. This aligns with the family-centered care approach, which places parents at the forefront of ensuring optimal child development.

Conclusion

Based on the research results, it can be concluded that the PRONA-KEPO approach has proven effective in improving the knowledge and skills of mothers of toddlers and preschoolers in early detection of child growth and development. After education and training, there was a significant improvement in both mothers' understanding of age-appropriate growth and development stages and their practical skills in monitoring development using simple methods such as the KPSP (Student Activity Chart) and daily stimulation. This approach is considered appropriate because it combines participatory education, hands-on practice, and mentoring, thus encouraging behavioral change, not just knowledge. Therefore, PRONA-KEPO can be recommended as a family empowerment model that can be widely implemented in child health programs at integrated health posts (Posyandu) and early childhood education (PAUD) levels to support sustainable early detection and intervention efforts for growth and development. The active involvement of mothers as primary observers of child development in the home environment is key to the success of this intervention.

Acknowledgments
We express our sincere gratitude to all parties who participated and dedicated their time to supporting this research. All forms of assistance and support provided were invaluable in ensuring the smooth implementation of the research and achieving optimal results.

Author Contributions
This article was written by three authors, namely M, I. H., and R. G. All authors contributed to each stage of the implementation of the activities until this article was completed.

Funding
This study was not funded by any organization or agency.

Conflicts of Interest
The authors declare no conflict of interest.

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