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Enhancing the knowledge and skills of health cadres and mothers to prevent developmental disorders through stimulation interventions

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Abstract

The golden age of toddlerhood is a crucial time for growth and development that requires special attention. Failure to support children during this time can cause developmental issues that affect their future growth. This study examined whether toddler growth and development interventions prevent developmental disorders. This pre-experimental study used a one-group pre-test/post-test design. The proportional random sample included 70 participants. The respondents' age, occupation, education, use of toddler growth and development stimulation interventions, and health cadres' and mothers' knowledge and skills were variables. Data were analyzed using Wilcoxon and Mann-Whitney. There was a significant increase in health cadres and mothers' knowledge and skills for promoting toddler growth and preventing developmental disorders ($P=0.000<0.05$). Effective toddler growth and development interventions improve health cadres and mothers' knowledge and skills, preventing developmental disorders in toddlers. These findings suggest that targeted educational programs for health cadres and mothers may reduce developmental disorders and promote healthier growth trajectories for children.

Introduction

The early years of a child's life, often referred to as the "golden age," encompass the first 1000 days until they reach two years old.¹ This critical period is crucial for growth and development, necessitating attention from all parties.² Failure to support a child properly during this time can lead to significant developmental issues that impact their future growth and development.³ Consequently, it is imperative for parents, caregivers, and healthcare professionals to work collaboratively to ensure the well-being and healthy development of children during these formative years.⁴

Over 200 million children under the age of five worldwide did not meet their developmental potential, with most of these children living in Asia and Africa.⁵ National data from the Indonesian Ministry of Health in 2014 indicated that 13-18% of children under five in Indonesia experience growth and development disorders. World Health Organization also reports that 5.25% of preschool-aged children suffer from minor brain dysfunctions, including impaired fine motor development. The survey from Basic Health Research (Riskesdas) in 2013 revealed that in Indonesia, 12.4% of children experience gross motor disorders, and 9.8% experience fine motor disorders, highlighting that motor development issues remain a significant public health concern.⁶

Monitoring growth and development closely is essential for early detection and minimization of developmental abnormalities, which can otherwise become permanent.⁷ However, interventions to stimulate toddler growth and development have not been maximally implemented by health workers

or mothers. Children who do not receive adequate growth and development stimulation are at risk of adverse effects on their future development.¹

To prevent developmental disorders in children, it is crucial to implement growth and development stimulation interventions as early as possible.⁸ Parents and health cadres through integrated service posts (*posyandu*) activities, teachers, and health workers should all be involved. Health workers play a key role by providing education, guidance, and monitoring the implementation of activities.⁹

Efforts to improve knowledge and skills related to stimulation, intervention, and early detection of child growth and development should target parents, health cadres, and the community. Enhancing the capabilities of health cadres ensures they can reach their maximum potential and actively contribute to public health through *posyandu* activities.¹⁰ Well-informed cadres can effectively detect early developmental issues and provide necessary interventions. Meanwhile, parents, as the closest figures to their children, continuously monitor and stimulate their growth and development.¹¹

This study aimed to improve the knowledge and skills of health cadres and mothers of toddlers regarding the application of growth and development stimulation interventions to prevent developmental disorders in toddlers.

Materials and Methods

Research design

The research was a pre-experimental design, utilizing a one-group pre-test and post-test design without a control group. The sample consisted of 70 participants selected through proportional random sampling. Variables included respondents' age, occupation, education, and the application of toddler growth and development stimulation interventions, as well as the improvement in knowledge and skills among health cadres and mothers of toddlers. Data were analyzed using the Wilcoxon and Mann-Whitney tests.

Study participants

The sample in this study was selected through proportional random sampling, targeting mothers of toddlers and health cadres residing in the research locations who met the inclusion and exclusion criteria. The sample size for mothers of toddlers was taken from 40% of the total population. All cadres present at the research location were included, resulting in a total sample size of 70 respondents. The inclusion criteria for the study were: mothers of toddlers, active health cadres, residing in the study area, willing to participate as respondents, and cooperative. The exclusion

criteria were respondents who were not present during the study, and those who did not participate in the stimulation activities for toddler growth and development interventions until completion.

Variables

The independent variable is the application of stimulation interventions for toddler growth and development, while the dependent variable is the increased knowledge and skills of health cadres and mothers of toddlers.

The instruments used in this study were developed by the researcher. The primary instrument was a questionnaire sheet designed to collect data from respondents. This questionnaire gathered information on the respondents' characteristics, including age, education, and occupation. Additionally, it measured the respondents' knowledge about the application of stimulation interventions for toddler growth and development aimed at preventing developmental disorders.

Complementing the questionnaire, observation sheets were employed to assess the respondents' ability to perform or demonstrate the stimulation interventions. These observations focused on how well the respondents could implement the growth and development interventions to prevent developmental disorders in toddlers.

Data analysis

The analysis aimed to describe the characteristics of the variables studied. Wilcoxon analysis was used to assess the level of knowledge and skills of health cadres before and after the intervention, with a significance level of $\alpha=0.05$. To compare the average knowledge and skills between health cadres and mothers of toddlers, the Mann-Whitney test was employed.

Ethical clearance

This research received ethical approval from the Health Research Ethics Commission of the Makassar Ministry of Health, as indicated by ethics certificate No. 0284/O/KEPK-PTKMS/III/2023. Throughout the study, researchers adhered to ethical principles, including informed consent, respect for human rights, beneficence, and non-maleficence.

Results

Based on Table 1, the study included participants of various ages and educational backgrounds. The age distribution was as follows: 4.3% of participants were under 20 years old, 21.4% were between 20 and 29 years old, 35.7% were between 30 and 39 years old, 21.4% were between 40 and 49 years old, and 17.1% were between 50 and 59 years old. In terms of education, 7.1% of participants

completed elementary school, 22.9% had completed junior high school, and a significant majority of 70.0% had completed senior high school.

Table 2 presents a comparison of knowledge and skill scores in the cadre group before and after the intervention. The average knowledge score increased from 8.05 before the intervention to 11.30 after the intervention. Statistical analysis revealed a P-value of 0.000, which is less than 0.05, indicating a significant difference in knowledge scores before and after the intervention. Similarly, the average skill score increased from 4.20 before the intervention to 6.45 after the intervention. The statistical tests also yielded a P-value of 0.000, which is less than 0.05, signifying a significant difference in skill scores between the pre- and post-intervention periods.

Table 3 shows a comparison of knowledge and skill scores in the group of mothers of toddlers before and after the intervention. The average knowledge score increased from 8.80 before the intervention to 11.62 after the intervention. Statistical analysis yielded a P-value of 0.000, which is less than 0.05, indicating a significant difference in knowledge scores before and after the intervention. In terms of skill scores, the average increased from 4.38 before the intervention to 6.58 after the intervention. The statistical tests also resulted in a P-value of 0.000, which is less than 0.05, signifying a significant difference in skill scores between the pre- and post-intervention periods.

Table 4 presents the comparison of knowledge and skill delta scores between cadres and mothers of toddlers. In terms of knowledge, the delta score, or the change in knowledge, was 3.25 for cadres and 2.82 for mothers of toddlers. Statistical analysis yielded a P-value of 0.636, which is greater than 0.05. This indicates that there is no significant difference in delta scores (changes between before and after) in knowledge between cadres and mothers of toddlers. Similarly, for skills, the delta score was 2.25 for cadres and 2.20 for mothers of toddlers. The statistical tests resulted in a P-value of 0.705, which is also greater than 0.05. This implies that there is no significant difference in delta scores (changes between before and after) in skills between cadres and mothers of toddlers.

Discussion

To form one's perspective, knowledge is a very important basis for a person. It is known that knowledge is the result of knowing someone who is understood through the five senses and knowledge can be influenced by age, interests, education, work, and experience obtained by someone from various sources.¹² Based on the results of the research that has been conducted, it was obtained that from 70 respondents, both cadres and mothers of toddlers had less knowledge about stimulation of toddler growth and development interventions, and after being given the application of stimulation of toddler growth and development interventions in the prevention of developmental disorders. The same thing was done before that there is an influence of growth and development stimulation

education on the ability to detect early growth and development of children aged 0-5 years by parents.¹³ Providing education on child growth and development stimulation can improve parents' ability to provide early growth and development stimulation which will have a positive impact such as increasing children's language and memory development.¹⁴ The application of stimulation provided is to stimulate the basic abilities of children to grow and develop optimally so that they have development that is appropriate for their age.¹⁵

The results of previous research that provide education on the stimulation of toddler growth and development given to mothers can increase knowledge in the stimulation of toddlers.¹⁶ In addition to using various methods by looking at the characteristics of respondents in terms of age, it can be said that the age of dominant respondents is between the ages of 30-39 years whereas the age is in adulthood, which is the age when someone is still able to work and produce something, According to Candrawati *et al.*,¹⁷ that age affects a person's level of knowledge. The increasing age of a person causes mental psychological changes, while according to Resti *et al.*,¹⁸ age affects a person's comprehension and mindset, the more mature a person is, the more developed one's grasp and mindset will be, so that the knowledge gained will be better, as well as according to Fera *et al.*¹⁹

In research activities carried out in addition to the age factor respondents who are of productive age, are very active in participating in activities that are done so that can increase knowledge.²⁰ Similarly, educational factors can significantly affect a person's mindset. The results of the research showed that most respondents have a high school education. It is noted that knowledge is greatly influenced by educational factors – the higher the education, the better the knowledge a person is likely to have.²⁰ However, this does not mean that someone with less formal education will necessarily lack knowledge, as knowledge can also be acquired through non-formal education.²¹ With the knowledge possessed by respondents both formally and informally as has been done through research, it will be very useful in guiding and monitoring children's growth and development and providing stimulation effectively in the hope that children can grow and develop without experiencing developmental disorders.^{22,23}

Health cadres who have been trained in applying stimulation interventions have gained knowledge that can be utilized in *Posyandu* activities. Developing the abilities of these cadres is essential, especially in the field of maternal and child health, to ensure that toddler growth and development interventions are properly implemented. This allows for effective monitoring of toddlers in the primary health care area and early intervention if problems arise.

These findings align with previous research by Umam *et al.*, which showed that cadres' knowledge and skills improved significantly after training on stimulation interventions.²⁴ Actions performed by individuals are often based on their knowledge, making it crucial for an effective

implementation of stimulation activities.¹⁷ The more frequently respondents apply stimulation techniques to their children, the better the developmental outcomes, as frequent stimulation aligns development with the child's age.

The results are also consistent with research by Kurniasih *et al.*, which found that knowledge is the most dominant factor affecting cadres' skills in early detection of child growth and development.²⁵ Cadres with good knowledge are 13.9 times more likely to have better skills than those with less knowledge. Therefore, it is essential for mothers of young children to engage in stimulation interventions to ensure optimal growth and development, preventing delays or developmental issues. The researchers conclude that applying stimulation interventions for toddler growth and development effectively enhances the knowledge and skills of health cadres and mothers, positively impacting children's developmental phases and promoting optimal health.

Conclusions

The application of stimulation interventions for toddler growth and development to cadres and mothers has been proven to significantly increase their knowledge and skills in preventing child developmental disorders. This comprehensive approach ensures that both health cadres and mothers are better equipped to recognize and address early signs of developmental issues. By enhancing their understanding and practical abilities, these interventions empower them to provide more effective support and stimulation to toddlers, promoting optimal growth and development. Overall, the study confirms that the targeted application of stimulation interventions is an effective strategy for enhancing the capabilities of both cadres and mothers, ultimately contributing to the prevention of developmental disorders and fostering healthier developmental trajectories for children.

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Table 1. Characteristics of respondents (n=70).

Characteristics	n	%
Age		
<20 years	3	4.3
20-29 years	15	21.4
30-39 years	25	35.7
40-49 years	15	21.4
50-59 years	12	17.1
Education		
Elementary school	5	7.1
Junior high school	16	22.9
Senior high school	49	70.0

Table 2. Knowledge and skill score comparison between before and after intervention in cadre groups.

Cadre	Knowledge		P	Skill		P
	Pre	Post		Pre	Post	
Mean	8.05	11.30	0.000*	4.20	6.45	0.000**
SD	1.57	1.53		0.62	0.69	
Median	8.00	11.00		4.00	6.00	
Minimum	5.00	9.00		3.00	5.00	
Maximum	11.00	15.00		5.00	8.00	

SD, standard deviation.

Table 3. Comparison of knowledge and skill scores before and after intervention in the mother-toddler group.

Mother of toddler	Knowledge		P	Skill		P
	Pre	Post		Pre	Post	
Mean	8.80	11.62	0.000	4.38	6.58	0.000
SD	1.71	1.61		0.81	0.73	
Median	9.00	12.00		4.00	7.00	
Minimum	5.00	8.00		3.00	5.00	
Maximum	12.00	15.00		6.00	8.00	

SD, standard deviation.

Table 4. Knowledge and skill delta score between cadres and toddler mothers.

Group		Delta (pre-post)					P*
		Mean	SD	Median	Minimum	Maximum	
Knowledge	Cadre	3.25	2.05	2.00	1.00	8.00	0.636
	Mother of toddler	2.82	1.38	2.00	1.00	7.00	
Skill	Cadre	2.25	0.64	2.00	1.00	3.00	0.705
	Mother of toddler	2.20	0.57	2.00	1.00	3.00	

SD, standard deviation. *Mann Whitney test.