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DEVELOPMENT OF RESEARCH INSTRUMENTS AS A MEASURE OF LITERACY IN ANALYZING NUTRITIONAL PROBLEMS IN TODDLERS AMONG POSYANDU CADRES

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ABSTRACT
Literacy in the context of nutritional issues in toddlers is the ability to understand concepts, apply them, and make decisions based on the science of nutrition and child health in a scientific, rational, and responsible manner to solve problems in daily life. Cadres, as one of the human data sources in the community and involved in health promotion and intervention efforts, need to develop literacy in studying how food and nutrients affect the growth, development, and health of toddlers. Toddler nutrition issues such as stunting, underweight, wasting, anemia, and obesity not only affect the physical condition of children but also their cognitive development and long-term performance. The development of research instruments needs to be carried out as a measure of the extent to which cadres understand nutritional issues in toddlers, which remains a serious problem in Indonesia. Objective: The development of this instrument aims to provide an overview and guidelines for developing health modules that can be used to train posyandu cadres in assisting government programs to reduce nutritional problems in toddlers. Method: The process of developing this instrument consists of stages: 5 phases, namely 1) Initial investigation, 2) Design, 3) Construction/development, 4) Testing (test, evaluation, and revision), and 5) Implementation. Content validity test with Aiken's V coefficient, instrument validity is conducted using the product moment correlation method, while the reliability test is conducted using the Cronbach's Alpha method. Results: Each item of the research instrument to be used shows the following results expert construct validity test using Aiken's V coefficient value with results ≥ 0.80 and all item questions having Sig. < 0.05, it can be concluded that each question item is positively correlated and valid, while for the reliability interpretation results Reliability shows a Cronbach's Alpha value of 0.932 > 0.361, thus it can be concluded that the research instrument has high reliability (reliable). Conclusions: Content validity test with Aiken's V coefficient, instrument validity is conducted using the product moment correlation method, the development of this research instrument uses The validity test with Aiken's V coefficient shows that each item is valid. Pearson Product Moment is used to test the validity of the instrument, while Cronbach's Alpha is used to test the reliability of the instrument. while the reliability test is conducted using the Cronbach's Alpha method.

Keywords: literacy; nutrition problem analysis; posyandu cadres; research instrument

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INTRODUCTION

Indonesia will experience a demographic bonus, so strategies are needed to prepare a quality generation starting from creating a healthy and intelligent generation from now on. Toddlers with nutritional problems can pose a challenge for Indonesia Gold 2045 because toddlers with nutritional issues can hinder physical and cognitive development, intellectual growth in children, health problems including decreased immunity, high risk of infections, and other developmental issues, as well as negative impacts on their cognitive development, including learning and thinking abilities that can hinder the potential of future generations. Therefore, addressing nutritional issues in toddlers is crucial for achieving the vision of Indonesia Gold 2045 (Kominfo, 2023).

In the world in 2022, around 22.3% of children under the age of 5 experienced stunting, the prevalence of wasting was 6.8%, affecting approximately 45 million children, and it is estimated that 1 in 10 children experienced underweight, although specific figures vary by country (WHO, 2023). Based on the 2022 Indonesian Nutrition Status Survey (SSGI), the prevalence of stunting among toddlers in Indonesia is 21.6%, a decrease from 24.4% in 2021. Indonesia shows that around 4.5 million toddlers experience wasting, with more than 460,000 of them experiencing severe wasting ((UNICEF et al., 2023)), while the prevalence of underweight among toddlers reaches 17.1% (SKI, 2023).

The reduction of malnourished toddlers is currently a focus of attention in Indonesia. Various intervention programs have been implemented, but the incidence of toddlers with nutritional problems such as stunting, underweight, wasting, anemia, and obesity has not significantly decreased. Therefore, it is necessary to evaluate the issues occurring in the community. Toddler nutrition problems not only affect the physical condition of children but also their cognitive development and long-term performance due to suboptimal brain development and organ function (Kementrian Koordinator Bidang Pembangunan Manusia dan Kebudayaan Republik Indonesia, n.d.). To understand the issues present in the community, it is necessary to develop a research instrument as a tool for data collection that analyzes the extent of understanding regarding the concept of toddler nutrition and the participation present in the community, especially among cadres who are at the forefront in addressing toddler nutrition problems in the community. The results of the development of this research instrument can be used to develop health modules that are used to train posyandu cadres in assisting government programs to reduce nutritional problems in toddlers.

Literacy is the ability to understand scientific concepts and processes and to use science to solve problems in everyday life (Rosidin et al., 2023). Science literacy can improve an individual's mindset through understanding science and being able to solve problems in various aspects of life (Seprianto & Hasby, 2023). Science literacy in the context of toddler nutrition issues is the ability to understand concepts, apply them, and make decisions based on the science of nutrition and child health in a scientific, rational, and responsible manner to solve everyday problems. Examples of scientific literacy in the context of nutritional issues in toddlers that can be applied include understanding how food and nutrients affect the growth, development, and health of toddlers, knowing how to choose healthy foods, their composition, and the frequency of feeding toddlers, understanding the importance of the concept of healthy food for immune function, identifying toddlers who are picky eaters and their intervention behaviors, and analyzing the function of the Healthy Menu Card in the context of monitoring the growth and development of toddlers(Suharto et al., 2020). Nutrition and health instruments based on questionnaires that are often used as the basis for policy-making in Indonesia and around the world. Health literacy is an instrument to determine the level of health literacy among individuals and communities, in this case, the posyandu cadres (Review, 2024).

The development of research instruments is always carried out in a study because valid and reliable instruments are needed to collect research data. Research instruments can be developed independently or by using existing instruments, in other words, by adopting instruments available from previous studies that are related to the research to be conducted by a researcher. However, if the research being conducted has not been done before and no instruments have been created for it, the researcher must develop the instruments themselves. The activity of building and assembling the research instrument by oneself is called instrument development (Pandra & Bellinda, 2024). This research

aims to provide an overview of the types of instruments that will be developed, as well as to conduct validity and reliability tests, which refer to the extent to which measurement results reflect what is supposed to be measured. Whereas validity testing aims to ensure that the measurement tool truly measures what it is supposed to measure, reliability measures the extent to which an instrument provides consistent results when used repeatedly.

Research instruments are an important component in scientific research because they allow for the possibility that instruments from one study can be reused by other research with related and similar needs. This means that research instruments can become a scientific asset for a researcher who develops them. The development of instruments can be carried out by following research and development methods. Researchers can develop instruments by following the procedural steps of instrument development based on theory and research needs or by modifying the instrument development work steps, which are then used to collect research data (Pandra & Bellinda, 2024) The purpose of the development of this Research Instrument is to provide an overview and guidance for developing health modules that can be used to train posyandu cadres in assisting government programs to reduce nutritional problems in toddlers.

METHOD

Development of Research Instruments as a Literacy Measurement Tool for Posyandu Cadres in Analyzing Nutritional Problems in Toddlers uses instrument development according to Plom (1997), which consists of 5 phases: 1) Initial investigation, 2) Design, 3) Construction/development, 4) Testing (test, evaluation, and revision), and 5) Implementation ((Eds.), 1997).

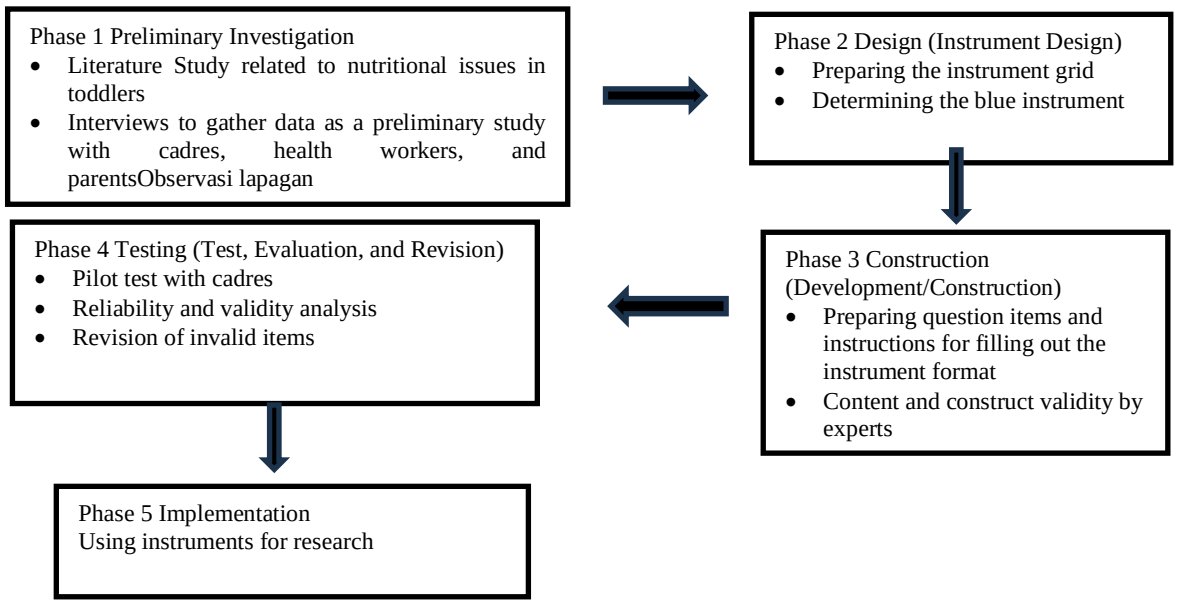

Figure 1 Instrument Development Procedure according to Plom 1997

RESULT

The development of the research instrument has been carried out through 5 stages that encompass the scope of a) Basic Understanding of Toddler Nutrition, b) Mastery of Skills in Categorizing Toddler Nutrition, c) Access to Information on Toddler Health Services, d) Critical Thinking and Problem-Solving Skills, e) Educational Communication Skills about Toddler Nutrition as explained in the following image:

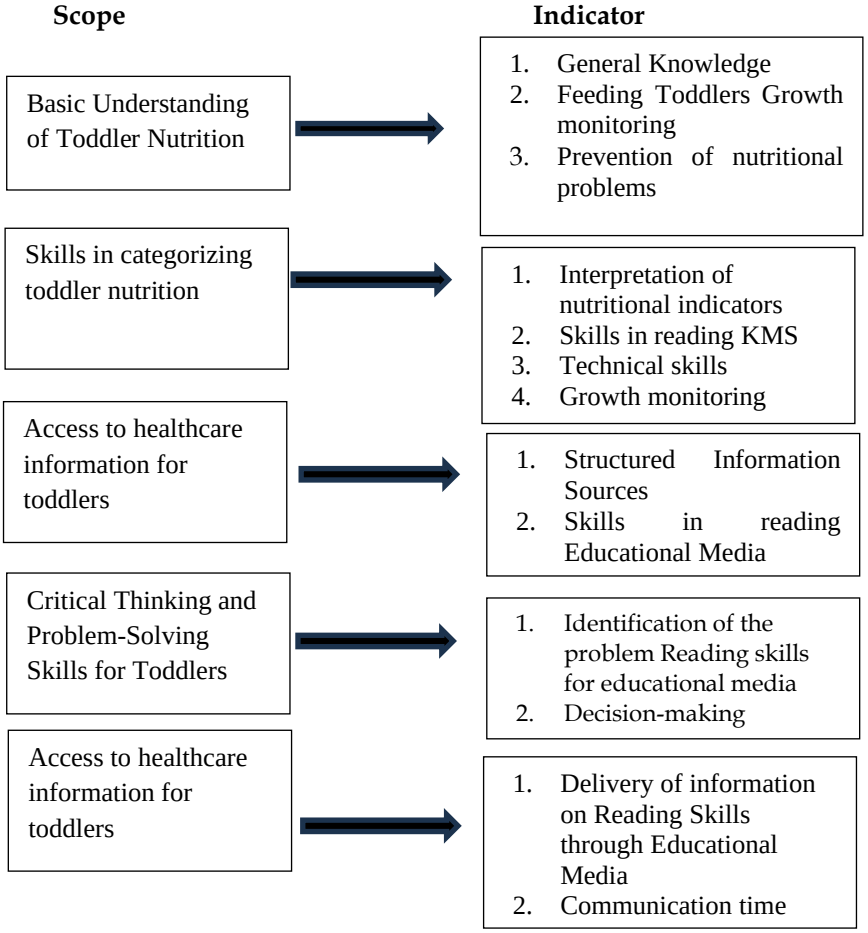

Figure 2. Scope and Indicators for the Development of an Instrument to Analyze Nutritional Problems

Table 1.
Results of the Analysis of the Science Literacy Research Instrument for Posyandu Cadres In the Analysis of Nutritional Problems in Toddlers

Scope	Indicator	Item Soal	Aiken's V	Uji Validitas	Keterangan
Basic Understanding of Toddler Nutrition	General knowledge	What is meant by the first 1000 days of life	1.00	0.001	Valid
		What is the purpose of the Kartu Menuju Sehat (KMS)	0.90	0.001	valid
		What Nutrients that are important for preventing anemia in toddlers	0.90	0.001	Valid
		Which is not included in the benefits Exclusive breastfeeding is	0.95	0.001	valid
		Animal protein sources for toddlers are	0.90	0.001	Valid
	Feeding toddlers	Exclusive breastfeeding is for	0.80	0.001	Valid
		Complementary feeding should ideally start when the baby is.	0.80	0.001	Valid
		Animal protein sources for toddlers are	0.80	0.003	valid
	Growth monitoring Prevention of nutritional problems	Which includes energy source foods for toddlers is...	0.90	0.001	Valid
		The purpose of growth monitoring at the posyandu is to…	0.85	0.001	valid
		The criteria for toddlers with good nutritional status are...	0.90	0.002	Valid

		One of the indicators of a toddler's nutritional status is...	0.80	0.001	valid
Skills in categorizing toddler nutrition	Interpretation of nutritional indicators	Nutritional indicators based on height for age are used to assess...	0.80	0.001	Valid
		If a toddler does not gain weight in two months, then...	0.80	0.001	valid
	Reading skills KMS	If the child's weight is below the red line on the KMS, then their nutritional status is...	0.90	0.003	Valid
		The growth line on the KMS is drawn based on...	0.90	0.001	valid
	Technical skills	The skills of cadres in reading the KMS graph are very important because	0.95	0.001	Valid
		If the child experiences weight gain but remains in the yellow zone, then.	0.85	0.001	valid
	Growth monitoring	The accuracy of reading a child's age is very important because...	0.90	0.001	Valid
		Children with stagnant weight gain charts indicate...	0.80	0.001	Valid
Access to healthcare information for toddlers	Structured Information Source	The main source of information about toddler immunization that can be accessed by cadres is...	0.80	0.001	valid
		Information about the nutritional status of toddlers can be viewed through...	0.80	0.001	Valid
		The book commonly used by cadres to record and monitor toddlers is...	0.90	0.002	valid
	Structured Information Source	The most appropriate media to access educational health videos for children is	0.90	0.001	Valid
		Information on the complete immunization status of toddlers can be found at...	0.90	0.001	valid
Critical Thinking and Problem-Solving Skills for Toddlers	Identify the problem	I analyze the causes of nutritional problems in toddlers based on my observations.	0.85	0.001	Valid
		I can distinguish between relevant and irrelevant information in certain situations.	1.00	0.001	Valid
	Decision-making	Saya mempertimbangkan beberapa pilihan sebelum mengambil keputusan terkait pelayanan balita.	0.85	0.001	valid
		I am used to discussing solutions with the cadre team if we encounter obstacles in the field.	0.90	0.001	Valid
		I try a different approach if the first solution doesn't work.	0.80	0.001	valid
Access to healthcare information for toddlers	Information delivery	I am able to listen actively when the toddler's mother asks questions about nutrition.	0.80	0.001	Valid
		I can adjust my communication style to the background of the toddler's mother.	0.80	0.001	valid
		I use a friendly and polite approach in delivering nutrition education.	0.90	0.001	Valid
	Communication time	I understand when the right time is to provide education to mothers of toddlers.	0.80	0.001	valid
		I invite mothers of toddlers to actively participate during the educational sessions.	0.80	0.001	Valid

DISCUSSION

Each item of the research instrument to be used shows the following results. expert construct validity test using Aiken's V coefficient value with results ≥ 0.80 and all item questions having Sig. < 0.05, it can be concluded that each question item is positively correlated and valid, while for the reliability interpretation results Reliability shows a Cronbach's Alpha value of 0.932 > 0.361, thus concluding that the research instrument has high reliability (reliable). The results of the development of this research instrument yield the concept of science literacy among posyandu cadres in analyzing nutritional problems in toddlers, which consists of 5 scopes with 13 indicators as shown in Table 1. Understanding toddler nutrition issues needs to be possessed by posyandu cadres in the implementation of promotive and

preventive health problems in the community.The scope of the developed questions aims to determine the extent to which health cadres know and understand health issues, and to identify, analyze, plan, and implement solutions in addressing health problems in the community. The skills of health cadres in analyzing health issues in the community are essential to assist government programs in reducing health problems, and the counseling provided by cadres is effective in increasing community knowledge(Irdawati et al., 2024). The enhancement of cadres' skills in conducting health problem analysis must be carried out periodically to maximize their knowledge, and providing knowledge through training can have a positive impact on the community. Providing education to the community can be done through home visits, thereby establishing a strong reciprocal relationship between parents of toddlers and cadres (Siswati et al., 2022).

The development of instruments can serve as a measure of the extent of knowledge, attitudes, and behaviors of cadres regarding toddlers with nutritional problems. Providing training through modules or educational media such as videos or health applications can enhance the skills of cadres in identifying health issues in the community (Friska et al., 2022) (Haryanti et al., 2021). Providing health education in the form of demonstrations can effectively increase the knowledge of cadres and foster a positive attitude when dealing with toddlers experiencing nutritional problems. Although the understanding process of the cadres can also be influenced by age, education level, and marital status of the cadres (Mediani et al., 2022).The collaboration between policymakers, healthcare workers, Non-Governmental Organizations (NGOs), the private sector, cadres, and the community itself can provide solutions to reduce nutritional problems in toddlers. Each party has its own role in the effort to reduce nutritional problems in toddlers. The government acts as the main coordinator in the implementation of programs to reduce malnutrition issues in toddlers to ensure they run effectively in the field (Astuti et al., 2025).

Factors affecting nutritional issues in toddlers include inadequate nutritional access, congenital diseases, poor sanitation, inadequate hygiene practices, limited access to quality healthcare services, and socio-economic disparities. Addressing nutritional issues in toddlers. The government has made various efforts in addressing nutritional issues in toddlers, but the implementation has been less than optimal and has encountered many obstacles. Therefore, a comprehensive approach from various parties is needed so that community participation has a significant impact on accelerating the reduction of nutritional problems in toddlers(Communication et al., 2024).Many risks are believed to be the causes of nutritional problems at the community, family, household, and individual levels. At the community level, it is caused by inadequate healthcare services, environmental cleanliness, and clean water sources. At the family level, it can be caused by economic factors, nutritional fulfillment, and parenting patterns. At the individual level, it is caused by a history of illness, the birth weight of the baby, and the nutritional status of the mother during pregnancy (Rahayuwati et al., 2025). Access to services in urban areas tends to be more easily reachable, so residents living in urban areas are generally at a lower risk compared to those in rural areas of having toddlers with nutritional problems.

Parental characteristics, including education, income, and health insurance ownership, can be linked to the parenting styles applied to children. Highly educated mothers tend to seek diverse information to improve their children's nutrition and are more sensitive to efforts to prevent nutritional problems, such as providing quality nutrition and vaccinations to prevent certain diseases (Tangwa et al., 2024). Demographic and socioeconomic factors of parents, including occupation, education, breastfeeding practices, inadequate feeding patterns, number of children in the family, and recurrent diarrhea episodes, contribute to nutritional problems in

children, such as stunting and wasting (Danso & Appiah, 2023). Experts argue that protein from animal food sources has higher quality compared to protein from plant food sources, and also has a broader range of vitamins and nutrients. Families with low economic status experience limitations in their ability to purchase animal protein sources, resulting in the inadequate intake of nutrients such as iron and zinc, which tends to be suboptimal (Hikmah & Cahyati, 2023). The results of the development of this instrument are expected to serve as a reference in the creation of health training modules for posyandu cadres.

CONCLUSION

The development of this research instrument uses a validity test with the Aiken's V coefficient, which shows that each item is valid. Pearson Product Moment is used to test the validity of the instrument, while Cronbach's Alpha is used to test the reliability of the instrument. Both methods are important to ensure that the research instruments used are accurate and consistent. Based on the research results, it can be concluded that the developed health literacy instrument on toddler nutrition has proven to have high content validity.

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