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Kuresif 2.0 Barcode Technology to Improve Maternal Knowledge and Attitudes Regarding Complementary Feeding

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ABSTRACT

Objective: This study aims to evaluate the effectiveness of Kuresif 2.0: Barcode in enhancing mothers' knowledge and attitudes regarding complementary feeding rich in animal protein.
Method: A quasi-experimental design was employed, utilizing a pretest-posttest control group framework. The sample consisted of 100 mothers of toddlers, divided into 50 in the control group and 50 in the intervention group, selected through total sampling. Statistical analysis was performed using the Wilcoxon Test and Cohen's d for effect size. A questionnaire served as the research instrument.
Results: The findings indicate that Kuresif 2.0: Barcode significantly improved mothers' knowledge and attitudes regarding complementary feeding rich in animal protein. The knowledge variable exhibited a t-value of -17.955, with a p-value less than 0.001, indicating a highly significant increase in knowledge. Cohen's effect size for knowledge was calculated at 0.7, suggesting a moderate impact of the intervention. For attitudes, the t-value was -19.298, also with a p-value less than 0.001, confirming a significant influence of the intervention. The effect size for attitudes, represented by Cohen's d, was 0.4, indicating a small to moderate effect of the intervention on maternal attitudes.
Conclusion: Kuresif 2.0: Barcode significantly enhanced mothers' knowledge, demonstrating a stronger effect than on attitudes. These results underscore the importance of implementing structured interventions to foster improved knowledge and attitudes among mothers related to complementary feeding practices.

Keywords: Attitude, Complementary Feeding, Knowledge, Kuresif, Stunting

Introduction

Stunting is the devastating result of poor nutrition during the prenatal period and early childhood. Children suffering from stunting may never reach their full potential height, and their brains may not develop to their optimal cognitive capacity. These children start their lives at a marked disadvantage, with consequences that extend into adulthood; they are likely to experience learning difficulties in school, earn less as adults, and face barriers to community participation. Stunting has been declining steadily over the last decade, with 148.1 million, or 22.3% of children under age 5 worldwide, affected in 2022. Nearly all affected children lived in Asia, which accounts for 52% of the global share. More intensive efforts are necessary if the world is to achieve the global target of reducing the number of children with stunting to 89 million by 2030 (UNICEF, 2023).

According to data from the National Nutrition Status Survey of Indonesia (SSGI), the prevalence of stunting in Indonesia was 21.6% in 2023. This figure remains high, considering that the target for stunting prevalence in 2024 is 14%, while the WHO standard is below 20%. Munira (2013) asserted that stunting is caused by chronic malnutrition and recurrent infectious diseases. In 2011, the prevalence of stunting in West Java was reported at 20.2% (Dinkes Jabar, 2022). In Ciamis Regency, the incidence of stunting was recorded at 3.4% in 2022, down from 4.9% in 2021, and 6.4% in 2020 (Dinkes Ciamis, 2023).

Malnutrition continues to be a significant issue that severely impacts the quality of human resources in Indonesia. It arises from various factors, both internal and external to health problems. Nutrition-related issues in Indonesia can be grouped into three categories: first, the finished agenda; second, the unfinished agenda; and third, new problems that threaten public health, referred to as emerging problems. Stunting falls within the unfinished agenda (Kemenkes RI, 2017). It is linked to local cultural beliefs and the practice of complementary feeding, which is essential for children's growth and development (Suminar, 2024).

The causes of stunting can be ranked according to their influence: family income, exclusive breastfeeding, family size, education level of the child's father, employment status of the child's father, nutritional knowledge of the child's mother, family food security, education level of the child's mother, carbohydrate consumption levels in toddlers, accuracy of complementary feeding, fat consumption levels in toddlers, history of infectious diseases in toddlers, sociocultural factors, protein consumption levels in toddlers, maternal employment status, awareness of nutrition, energy consumption levels in toddlers, and completeness of immunization in toddlers (Supariasa, 2019).

Children who receive complementary feeding not aligned with the appropriate timing for starting such feeding are 2.8 times more likely to be stunted (z-score <-2). This indicates that the timing of initiating complementary feeding is significantly related to the incidence of stunting. Monotonous complementary feeding can prevent toddlers from meeting their nutritional needs. The types of food consumed by toddlers and their dietary habits also play a crucial role in nutrient intake. Dietary practices include breastfeeding patterns, the duration of breastfeeding, and the introduction of complementary foods (Wandini, 2021).

Mothers of stunted children often believe that their children's intestines are not strong enough to digest foods with coarser textures, such as eggs, fish, beef, and chicken. It is believed that sea fish should only be given when the child can walk, stemming from a longstanding belief that fish might contain worms. The avoidance of fish and other animal

products, which are excellent sources of protein, can adversely affect growth. In Pasongsongan Village, the feeding practices of stunted children under the age of two are heavily influenced by cultural beliefs. Changing the mindsets of mothers regarding feeding practices for their stunted children is essential (Soesanti et al., 2020).

Protein-energy malnutrition is essentially assessed through stunting prevalence, which stands at 48% among children under five. The determinants of protein-energy malnutrition are broadly classified into four categories: environmental factors, which include the physical and social environments; behavioral factors; health service-related factors; and biological factors (Bhutia, 2014). The relationship between stunting can be summarized in three broad conclusions: first, stunting is related to the child's food and environmental conditions; second, food security plays a crucial role in addressing stunting; and third, food diversity is an important indicator of nutritional status, impacting child development (Suminar, 2024).

Objective

This study aims to assess the effectiveness of the Kuresif 2.0 Barcode program in relation to the increased knowledge and attitudes of mothers with infants aged 0 to 24 months regarding complementary feeding rich in animal protein. Several previous studies have indicated a correlation between protein intake deficiency during the complementary feeding period and the prevalence of stunting. Therefore, it is essential to enhance mothers' knowledge about complementary feeding that is rich in animal protein to positively influence the attitudes of mothers with toddlers.

Method

This research employs a quasi-experimental design methodology, specifically using a pretest-posttest control group design based on a total sampling technique. The study subjects comprised 50 mothers of toddlers in a control group utilizing the Flipchart PMBA and 50 mothers in an intervention group using the Kuresif 2.0 Barcode at the Baregbeg Health Center. Statistical analysis will be conducted using the Wilcoxon Test and Cohen's effect size; the research instruments will include a questionnaire.

Result

Table 1 presents a demographic analysis of the studied population, covering several important variables. The average age of the respondents was 29.14 years, with a standard deviation (SD) of 5.37, indicating that most respondents were within the young to adult age range.In terms of education, the distribution revealed that 87 individuals (87.00%) had completed junior high school, while 11 individuals (11.00%) had an elementary school education, and 2 individuals (2.00%) had a high school education. This suggests a relatively low level of educational attainment within the sample studied. Regarding employment, the majority of participants were housewives, totaling 73 individuals (73.00%). Additionally, 15 individuals (15.00%) identified as self-employed, and 12 individuals (12.00%) were classified as workers. This data reflects the predominance of traditional roles in the household economy. In terms of parity, results indicated that 56 participants (56.00%) were first-born children, while 44 participants (44.00%) were second-born children, showing that first-born children were more represented in this sample. Furthermore, concerning the age of the children, the

distribution showed that 24 children (24.00%) were aged 6-8 months, 32 children (32.00%) were aged 9-12 months, and 44 children (44.00%) were aged 13-24 months. The majority of the children in this sample were aged 13-24 months, which may have particular relevance to the context of the study. Overall, the demographic data indicated a relatively homogeneous composition of the study population, characterized by participants with an average age of 29 years, a majority having completed junior high school education, predominance of housewives, and children aged predominantly 13-24 months. The T-values obtained from the analysis of each variable demonstrated no significant differences in the distribution, suggesting stability in the demographic characteristics of the studied group.

Table 1. Characteristics of Respondents

Variable	Categories	n / m	% / SD	t
Age	20–35	13	5.37	0.063
	36–40	87		
Education	Elementary School	11	11.00	0.580
	Senior High School	87	87.00	
	Higher Education	2	2.00	
Work	Housewife	73	73.00	0.211
	Entrepreneur	15	15.00	
	Labour	12	12.00	
Parity	Primipara	56	56.00	0.182
	Multipara	44	44.00	
Child Age	6-8 Month	24	24.00	0.647
	9-11 Month	32	32.00	
	12-24 Month	44	44.00	

Table 2 presents the results of a study conducted to evaluate the effectiveness of the intervention on the knowledge and attitudes of mothers with children under 24 months. The analysis, based on a paired t-test, revealed significant findings. For the knowledge variable, the obtained t-value was -17.955, with a p-value of less than 0.001. This indicates a significant difference in knowledge scores before and after the intervention. Cohen's effect size of 0.7 suggests that the Kuresif 2.0 Barcode intervention has a moderate impact on improving parental knowledge. In contrast, for the attitude variable, the t-value was -19.298, with a p-value also less than 0.001, indicating a significant influence of the intervention on parental attitudes. However, the measure of Cohen's d for attitudes was 0.4, suggesting that the effect of the intervention on parental attitudes was small to moderate.

Discussion

Kuresif 2.0: Barcode is an audiovisual counseling medium that provides essential information on feeding guidelines for children, requirements for complementary feeding according to the WHO, and various modified complementary feeding recipes tailored to a child's age. This content is presented in the form of videos accompanied by light discussions, making it easier for mothers to grasp the process of preparing complementary foods rich in animal protein. The aim is to enhance knowledge, address mothers' doubts, and improve their attitudes toward providing animal protein-rich complementary foods for infants aged 0 to 24 months. Kuresif 2.0: Barcode is an advancement of the initial Kuresif Audiovisual Media phase.

The objective of using Kuresif 2.0: Barcode is to increase mothers' knowledge and attitudes regarding complementary feeding rich in animal protein. Overall, the demographic data indicate a relatively homogeneous composition of the study population, characterized by participants with an average age of 29 years, a majority holding secondary education, and predominantly consisting of housewives with children aged 0-24 months. The T-values obtained from the analysis of each variable showed no significant differences in distribution, indicating stability in the demographic characteristics of the studied group.

Analysis results utilizing the paired t-test demonstrated significant findings. For the knowledge variable, the t-value was -17.955, with a p-value of less than 0.001, indicating a significant difference between knowledge scores before and after the intervention. Cohen's effect size of 0.7 suggests that the intervention, Kuresif 2.0: Barcode, has a moderate impact on improving parental knowledge. In terms of the attitude variable, the t-value was -19.298, with a p-value also less than 0.001, demonstrating a significant influence of the intervention on parental attitudes. However, the measure of Cohen's d effect for attitudes was 0.4, indicating that the effect of the intervention on maternal attitudes was small to moderate.

Several previous studies have demonstrated that audiovisual media effectively increases maternal knowledge. According to Kapti et al., audiovisual media serves as an engaging counseling medium that stimulates multiple senses. The provision of health education through audiovisual media has been shown to enhance maternal knowledge and attitudes. Thus, audiovisual media is an effective tool for imparting knowledge to mothers and positively changing their attitudes.

Other research has indicated an increase in mothers' knowledge and attitudes regarding complementary feeding after interventions using flipchart media. However, Kuresif audiovisual media was found to be more effective in improving maternal knowledge and attitudes about complementary feeding (Suminar, 2024).

The audiovisual method provides information that is quickly understood, as it is combined with clear visuals and sound, offering a direct representation to the audience (the mothers). This method simplifies the educators' task of delivering effective educational content (Amraini, 2024).

Kuresif 2.0: Barcode has the advantage of being easily accessible via smartphone scanning. Mothers can access the information contained in Kuresif 2.0: Barcode at any time, including the basic feeding rules for children, WHO requirements for complementary feeding, and recipes rich in animal protein suited for their child's age. However, a limitation of this research is that the tools used for displaying the content require consistent access to electricity for projectors and sound systems when presented to larger audiences.

Conclusion

The interventions implemented were successful in significantly increasing the knowledge of mothers with toddlers, demonstrating a stronger effect on knowledge compared to attitudes. This underscores the importance of conducting structured interventions that enhance understanding and foster relevant attitudes among mothers of toddlers. It is hoped that, in the future, Kuresif 2.0: Barcode media can be replicated, allowing more mothers to benefit from the resources and information it provides.

Conflict of interest

There is no conflict of interest.

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Authors' contribution

Each author contributed equally in all the parts of the research. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

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