



SIMPATIK website nutrition education on mother's knowledge and diversity of toddler consumption in Jambi City

Edukasi gizi website SIMPATIK terhadap pengetahuan ibu dan keragaman konsumsi balita di Kota Jambi

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Abstract

The problem of under-five nutrition is still a significant concern in developing countries. One of the main factors is the level of nutritional knowledge, so feeding toddlers is inappropriate and less varied. Nutrition education must be delivered in an informative and flexible. This study aims to analyze the effect of nutrition education based on the SIMPATIK website on mothers' knowledge and diversity of toddler consumption in Jambi City. The study used a Quasy Experimental design in a pre-post test only, with 60 mothers of toddlers as subjects in the working area of the Tahtul Yaman Public Health Center in 2022. Were collection used a questionnaire, interviews and assistance using the SIMPATIK. Statistical analysis using the Wilcoxon test at 95% CI. The results of the study, the SIMPATIK website on the nutritional knowledge of toddler mothers ($p= 0,000$; $\bar{D}= 2,18$), and diversity of food consumption ($p= 0,000$; $\bar{D}= 0,99$). In conclusion, SIMPATIK increased the nutritional knowledge of mothers of toddlers and the variety of toddlers' consumption in Jambi City. The SIMPATIK website can be used as a tool for nutrition education in the community.

Keywords: Diversity, nutrition education, SIMPATIK, toddler consumption

Abstrak

Permasalahan gizi balita masih menjadi perhatian utama di negara berkembang. Salah satu faktor penting yaiturendahnya pengetahuan gizi ibu, sehingga praktik pemberian makan balita tidak tepat dan kurang beragam. Peningkatan pengetahuan ibu balita dapat dilakukan melalui edukasi gizi yang dikemas secara informatif, dan bisa diakses kapan saja. Penelitian bertujuan untuk mengukur pengaruh edukasi gizi berbasis website SIMPATIK terhadap pengetahuan ibu dan keragaman konsumsi balita di Kota Jambi. Penelitian menggunakan desain *Quasy Eksperimental* secara *pre-post test only*, dengan subjek 60 ibu balita pada wilayah kerja puskesmas Tahtul Yaman tahun 2022. Pengumpulan data dengan kuesioner, wawancara dan pendampingan penggunaan SIMPATIK. Analisis statistik menggunakan uji Wilcoxon pada CI 95%. Hasil penelitian, website SIMPATIK terhadap pengetahuan gizi ibu balita ($p= 0,000$; $\bar{D}= 2,18$), dan keragaman konsumsi balita ($p= 0,000$; $\bar{D}= 0,99$). Kesimpulan, edukasi gizi berbasis website SIMPATIK dapat meningkatkan pengetahuan gizi ibu balita dan keragaman konsumsi balita di Kota Jambi. Website SIMPATIK bisa dijadikan salah satu media edukasi gizi di masyarakat.

Kata Kunci: Keragaman, konsumsi balita, pendidikan gizi, pola asuh, SIMPATIK

Introduction

Indonesia is a developing country that supports the Sustainable Development Goals (SDGs) to end all forms of malnutrition. Undernutrition is a nutritional problem that must be resolved immediately to achieve specific SDG goals (Badan Perencanaan Pembangunan Nasional 2021). The main goal of the SDGs is to end hunger by 2030 and ensure access to nutritious, safe, and adequate food for poor and vulnerable people, such as babies, and to end all forms of hunger and malnutrition in children under the age of five (Kemenkes RI, 2021).

Nutrition is a major investment in human resources for nation-building. Nutritional problems in toddlers from 2007 to 2021 did not show any significant changes. The prevalence of malnourished children under five years of age experiencing fluctuations was as follows: in 2007 (17,9%), 2010 (19,6%), 2013 (17,7%), 2018 (7,4%), and 2021 (7,1%), with a target of the Medium Term Development Plan (MTDP) of 6,8–7,3%. Attention should also be paid to addressing nutritional problems in Jambi City in 2021, with a prevalence of undernutrition of 8,85, which has not yet reached the target of the 2019–2024 MTDP (Kemenkes RI, 2021).

Diversity in quality consumption determines the optimal energy and nutrients that affect rapid growth and development into adulthood. Malnutrition during infancy is irreversible or nonrefundable (Beal et al., 2018). Several studies have shown that the causes of undernutrition in toddlers include low parental education, family income, low birth weight and birth length, breastfeeding for less than six months, the practice of giving complementary foods less, the incidence of infections, visits to irregular clinics, and lack of advice from health workers (Al Rahmad et al., 2020; Laksono et al., 2022; Yuniar et al., 2020).

One of the factors contributing to nutritional problems in developing countries is the level of education of parents and the knowledge of the mother or caregiver, who acts as a gatekeeper in determining or choosing food ingredients to be purchased and cooked (Paul et al., 2021). The results showed that the better the mother's habits in feeding toddlers, the better their nutritional status (Arini et al., 2017; Arini et al., 2022).

Providing nutrition education improves mothers' knowledge of the diversity of toddler

consumption. Several studies have shown that nutrition education can increase mothers' knowledge, make toddlers' food more varied, and improve toddler nutrition (Gustina et al., 2018; Noor & Mangi, 2018; Rachmayanti, 2018).

Studies in Kenya that improve the competence of mothers who need social support are assisted by health workers in the practice of administering complementary foods to toddlers (Schneider et al., 2017). Other studies have shown that nutrition education using nutrition action cards for toddler mothers can increase the variety of toddlers' foods (Junita et al., 2020). Nutrition education carried out by visiting homes can improve the diversity of food consumption among toddlers (Janmohamed et al., 2020)

Much research has been conducted on nutrition education to increase the nutritional knowledge of toddler mothers. However, there is no sustainable goal for nutritional knowledge in the community to be independent of the diversity of food consumption among toddlers. Providing nutrition education through media is one way to make it easier for toddlers to understand this material. In the era of digitization, access to nutrition education information can be easily obtained to quickly support an increase in health knowledge using websites. The use of a website can clarify the information conveyed, because the display is more attractive, interactive, and can be accessed at any time (Gustina et al., 2018; Yani, 2018).

The SIMPATIK website, which can be accessed via a smartphone, can be used to obtain information on the recording and reporting of consumption diversity and nutritional status. Dietary diversity was assessed using the web-based application, in Indonesian called "Sistem Edukasi MP-ASI Buah Hatiku (SIMPATIK)." This application can assist mothers in educating their toddlers on complementary feeding. Information that will later become the basis for the development of data and health information systems to support health programmes. An app that is packaged on a website that allows mothers to study independently, and it is hoped that there will be an increase in mothers' nutritional knowledge and diversity in toddler food consumption. The concept of learning through website media and mentoring is the novelty of this study. Based on this background, this study aimed to analyze the effect of nutrition education using the SIMPATIK website on mothers' knowledge and diversity of toddler consumption in Jambi City.

Methods

This type of research is quantitative and uses a quasi-experimental design, which aims to determine the impact of an education website sympathetic to knowledge and consumption diversity without a control group. Website development was carried out in 2014 through material and technology expert tests, which passed with improvements. Improvements to the application include adding educational videos and sounds in each section of the menu, assessing nutritional status, viewing passwords, and searching for food sources. The research obtained ethical feasibility with the number LB.02.06/2/127/2022 from the Health Research Ethics Commission of the Jambi Ministry of Health Polytechnics.

This research was conducted in the working area of the Tahtul Yaman Health Center in Kampung Melayu Arab, Jambi City, from June to October 2022. Purposive sampling was used to determine the research location, with the condition that the urban village and public health center were willing, especially cadres, the Integrated Healthcare Center, and mothers of toddlers. The number of subjects involved was 60 people who met the following inclusion criteria: (1) mothers who had toddlers between the ages of 6 and 59 months; (2) living and staying for 6 months in the work area of the health center; and (3) toddlers who were not sick and did not receive medical therapy for >3 days, such as fever, cough, or runny nose during the study. The participants were proportionally allocated to the 12 Integrated Healthcare Centers in the working area of the Tahtul Yaman Health Center.

In the previous research stage, a website was developed through a prototyping model consisting of system requirements, website design, implementation, and evaluation. The SIMPATIK app, can be accessed from URL: <https://litmas.poltekkesjambi.ac.id/simpatik>, and instructions for use the App on the URL: <https://link.kemkes.go.id/demosimpatik>, or a demo account as follows: username: 081300000001, and password: 081300000001.

SIMPATIK is a website that provides complementary feeding education to toddlers. In the first step, the mother creates an account, logs in, and enters the child's data, including name, date of birth, and gender of the toddler. On the website, there is a menu on my toddler's

nutrition. In my toddler nutrition menu, there is a sub-menu on food ingredients consisting of staple foods, animals, vegetables, and fruit-side dishes with nutritional energy content, carbohydrates, protein, and fat per 100 g. The next menu is a history of toddler food to determine the diversity of toddler food consumption, which can be compared with toddler nutritional adequacy numbers. Furthermore, mothers can also determine the nutritional status of toddlers according to weight categories based on age. The next menu contains nutritional information for my toddler, including nutritional education for toddler mothers regarding toddler feeding. The last menu concerned the question and answer columns for the toddlers with nutritionists.

Maternal nutritional knowledge was collected through interviews using a questionnaire consisting of 20 questions. Each correct question was assigned a score of 20, with a maximum total score of 100. The questionnaire was valid and tested for reliability, with a Cronbach's alpha of 79,2%.

The diversity of food consumption was assessed through interviews and food recalls 24 hours a day, completed by the mother every day on the SIMPATIK website, and then included in the Individual Dietary Diversity Score (IDDS) questionnaire consisting of nine food groups (starchy staple foods, green vegetables, fruits and vegetables rich in vitamin A, other fruits and vegetables, offal, meat and fish, eggs, legumes, whole grains, milk, and dairy products). Assessment of consumption by giving a score: if toddlers consumed food in nine food groups on the food questionnaire, they were given a score of 1, and if they did not consume food, they were given a score of 0; then, the average consumption diversity was calculated. The IDDS questionnaire was tested for validity and reliability, with a Cronbach's alpha (69,2%).

On the first day (pretest), we asked the mothers of toddlers about their nutritional knowledge about complementary feeding and their habit of providing food for toddlers during the last 24 h (starting from waking up to going back to sleep). Enumerators fill in the diversity of food consumption every day. In weeks 1, 2, and 3, nutrition workers at the public health center received education on complementary feeding. On the 4th or 30th day, the mother's nutritional

knowledge and diversity of toddler food consumption were assessed (Figure 1).

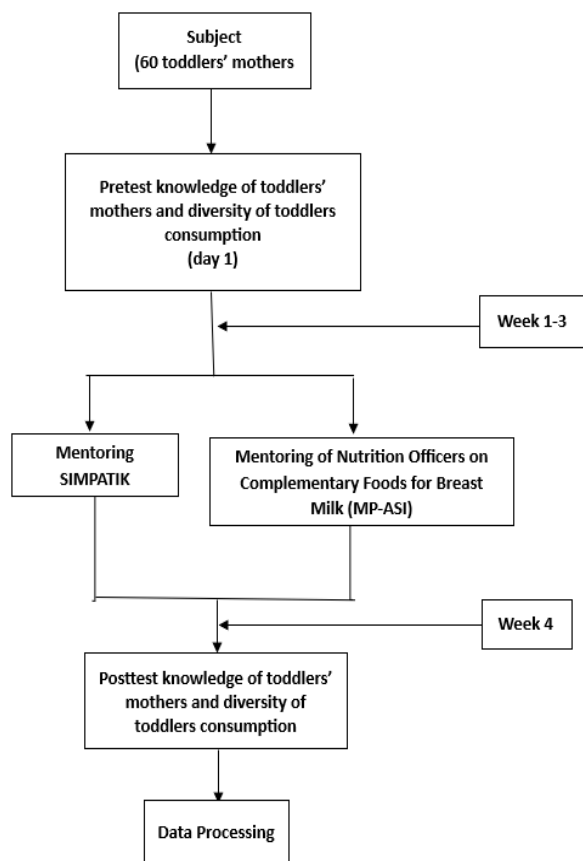


Figure 1. Flow chart of research intervention

The pre-requisite test results (Kolmogorov-Smirnov) for parametric analysis showed that the data were not normally distributed ($p < 0,05$) for the knowledge variable ($p = 0,000$) or the variation in consumption variable ($p = 0,000$). Therefore, inferential data analysis was performed using Wilcoxon test at a significance level of 95%.

Result and Discussion

Subject Characteristics

Subject characteristic data included the sex of the toddler, education, and the mother's occupation. The results of the study (Table 1) showed that 53,3% of children under five were female, the majority (88,3%) of mothers had a senior high school education, and 51,7% of mothers did not work or were housewives.

Mothers' education affects their knowledge when choosing food for toddlers. High family income can provide quality food for toddlers, so

that the food provided is varied, nutrients for toddlers are met, and toddlers do not develop nutritional problems (Khaliq et al., 2022; Muliwati et al., 2021; Yeshaneh et al., 2022)

Table 1. Characteristic distribution of the subjects

General Characteristics of Subjects	n	%
Toddlers' gender		
Male	28	46,7
Female	32	53,3
Mommys' education		
Senior High School	53	88,3
Higher Education	7	11,7
Job		
Work	29	48,3
Does Not Work	31	51,7

Description of the Diversity of Consumption of Weaning Food for Toddlers

Based on the results of research on the behavior of mothers under five in providing a variety of complementary foods for toddlers before and after nutrition education is carried out, it can be seen in Table 2.

Table 2. Description of the diversity of consumption of complementary foods for toddlers

Behavior	Mean	Median	Min-Max
Before:			
Breakfast	2,10	2,0	0 - 4
Lunch	2,50	3,0	0 - 5
Dinner	2,18	2,0	0 - 5
After:			
Breakfast	2,93	3,0	0 - 5
Lunch	3,43	3,0	0 - 5
Dinner	3,28	2,0	0 - 6

As shown in Table 2, before the intervention using the SIMPATIK website, the diversity of food consumption given by mothers to their toddlers at breakfast was 2,1, where the maximum was for mothers to give four types of food to their toddlers. After being given a variety of food interventions by toddler mothers, an average of 2,93 and a maximum of five types of food were given to mothers. The diversity of food consumption given by mothers to their toddlers at lunch was an average of 2,5 types after being given an intervention to 3,43 types, and the most

given five types. The diversity in food consumption at night before the intervention was 2,18. After the intervention, the average was 3,28 types, and most mothers provided six types of food to their toddlers.

The integration of nutritional materials in a sustainable manner and examples of complementary foods are key to success in increasing food consumption diversity (Abdillah et al., 2020). An increase in the types of food provided by mothers is also indirectly related to mothers as domestic workers who have a lot of time to pay attention to the food that toddlers must consume (Nasrul et al., 2022).

The Impact of SIMPATIK Website Nutrition Education on Knowledge and Consumption Diversity

As shown in Table 3, the average value of knowledge of the diversity of food consumption in toddlers before the intervention was 7,30 and after 9,48. There was an increase in knowledge

after carrying out nutrition education using the SIMPATIK by as much as 2,18 points.

Likewise, regarding the diversity of food consumption, the average value of the diversity of food consumption in toddlers before the intervention was 2,83 and after increase 3,82. There was an increase in food consumption diversity with a difference of 0,99 points. The results showed that providing nutrition education using the SIMPATIK could increase mothers' knowledge and diversity of food consumption among toddlers in Jambi City.

Nutrition education using a website with mentoring techniques is an innovation that can improve nutrition knowledge, motivation, and attitudes and behaviors in providing complementary foods to toddlers. Through SIMPATIK, mothers' knowledge and diversity of food consumption for toddlers increased. This study is in line with the study by Junita et al. (2020) showing that nutrition education, accompanied by a nutrition officer, can increase 4,19 points by providing a variety of toddler foods.

Table 3. Impact of SIMPATIK nutrition education on knowledge and diversity of children's food intake

Variables	Mean \pm SD	Mean Different \pm SD	p-value
Nutritional Knowledge			
Before	7,30 \pm 0,99	2,18 \pm 0,49	0,000
After	9,48 \pm 0,95		
Diversity of feeding intake			
Before	2,83 \pm 0,95	0,99 \pm 0,34	0,000
After	3,82 \pm 1,28		

Nutrition officers play an important role in providing complementary food for breast milk (complementary food) by visiting toddlers' homes in the morning, afternoon, and evening to provide motivation and help and remind mothers regarding understanding in providing toddler food consumption, so that mothers make improvements to the provision of complementary food according to the age of the toddler (Faridi et al., 2020). In line with two previous studies, research in Yogyakarta has shown that nutrition education with mentoring can increase mothers' knowledge of food provision for toddlers (Abdillah et al., 2020).

According to a study in India, mothers who receive nutritional education can increase the diversity of their toddlers' food consumption (Pavithra et al., 2019). It is important to provide parents or caregivers with appropriate education and social support so that they can emphasize

clear and consistent references to information and avoid misinformation regarding infant feeding (Biks et al., 2018; Thow et al., 2017).

The SIMPATIK website is designed to make it easy for mothers of toddlers to obtain complete information about complementary food so that mothers do not have to look for information related to nutrition (the nutritional content of food and nutritional status), the diversity of toddler food consumption compared to the nutritional adequacy rate, etc.

Nutrition education using websites can clarify information because they are more interesting, interactions occur quickly, and are flexible. Nutrition education packaged on the website is technology-based education that can support the improvement of health knowledge. Research on nutritional education interventions can improve balanced nutritional behavior (Perdana et al., 2017). Smartphone- and gadget-

based nutrition education increases the nutritional knowledge of mothers under five years of age and the diversity of consumption and food intake of toddlers, improving nutritional status (Anjani et al., 2022; Rahmad et al., 2022; Setyawati & Herlambang, 2015).

Nutrition education assistance using the website is carried out with the concept of two-way communication using the following three steps: 1) researchers, enumerators, and nutrition officers are mentors who play a role in gathering information from mothers of toddlers; 2) the companion concludes the information obtained so that the problems of the mother under five are known; and 3) researchers and nutrition officers intervene by providing information on website usage, nutrition knowledge, and advice according to the problems of toddler mothers (Faridi et al., 2020).

This study has several limitations. Methodologically, the number of samples in the study was small, there was no control group, and there were no special control interventions. The perceived duration of the study was insufficient to change parenting patterns in terms of feeding.

According to the findings of this study, not all mothers of toddlers are able to use this website easily because mothers of toddlers are not used to opening their Android to open a link and then have trouble logging in. Based on these problems, assistance was provided to the mothers of the toddlers using the website. The subject of mothers under five is difficult to find, so it takes effort because there are many mothers' activities, so researchers have to make appointments to meet. The nutritional value of the food ingredients contained in the website is per 100 g; therefore, food intake cannot be measured according to what is consumed by toddlers. Therefore, it is necessary to revise the information related to portions and nutritional values.

Although this study has limitations, it can prove that SIMPATIK can provide convenience in accessing nutrition education and evaluating the diversity of food consumption for toddlers.

Conclusion

SIMPATIK can increase mothers' nutritional knowledge and diversity of food consumption among toddlers. The implications of this research can strengthen the theory of

nutrition education and increase the knowledge and variety of toddler consumption.

The SIMPATIK website can be used as a medium for nutrition education in nutrition programs to monitor the diversity in toddler consumption.

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