



## The Use of Manajemen Nutrisi Balita Stunting (MNBS) Smartphone Application as an Educational Media on Maternal Knowledge and Attitudes in Preventing Stunting in Geneng District Ngawi Regency

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**Abstract.** *Stunting indicates a high prevalence of nutritional deficiencies that have not yet reached reduction targets, as seen in Geneng District, Ngawi Regency. Maternal knowledge and attitudes are crucial factors in preventing stunting and can influence mothers' behaviors in ensuring nutrition for toddlers. Manajemen Nutrisi Balita Stunting (MNBS) is an innovative intervention designed to address specific nutritional needs. It was developed into a smartphone application that serves as an educational tool to prevent stunting issues. This study aims to analyze the impact of MNBS on maternal knowledge and attitudes towards stunting prevention. This study used a one-group pretest-post-test design approach. Sampling was conducted using simple random sampling involving 30 respondents. Inclusion criteria for this research included mothers with toddlers experiencing malnutrition, owning a smartphone, and being willing to participate in the study until completion. The research results indicate that maternal knowledge and attitudes towards preventing stunting improved after receiving education through Manajemen Nutrisi Balita Stunting (MNBS) smartphone application. Manajemen Nutrisi Balita Stunting (MNBS) Smartphone Application has an impact as an educational medium on maternal knowledge and attitudes toward preventing stunting.*

**Keywords:** *Smartphone Application, Knowledge, Attitude, Stunting.*

### 1. INTRODUCTION

Children's success in achieving optimal growth and development is a key factor for the progress of a nation. The early years of a child's life, especially from the time they are in the womb until they are two years old, are a very important period. This period is a valuable opportunity as well as being vulnerable to negative influences. Children's growth is characterized by an increase in physical dimensions, such as body weight, height and head circumference, according to their age. *Stunting* is a condition that describes chronically deficient nutritional status during the early stages of growth and development. A toddler is said to be stunted if the PB or TB measurement results show  $<-2$  SD (standard deviation) from the median growth standard based on WHO [1].

Nutritional Status Monitoring (PSG) data for the last 3 years shows that *stunting* has the highest prevalence compared to other nutritional problems such as malnutrition, thinness, and obesity. The prevalence of stunting according to the results of the 2023

Indonesian Health Survey (SKI) has decreased from 21.6% (2022 SSGI) to 21.5%. This decline in the prevalence of stunting has occurred successively over the last 10 years (2013-2023). In 2023, the prevalence of stunting in Ngawi Regency will still be at 28.5% [2].

Stunting is caused by two types of factors, namely direct causes and indirect causes. Direct causes of stunting include insufficient food intake and disease infections. Meanwhile, indirect causal factors include food insecurity in the household, inadequate health services, and parents' parenting patterns that are not optimal [3], [4].

The mother's level of nutrition knowledge is one of the factors that can influence the occurrence of stunting in toddlers. This increase in knowledge is usually triggered by the mother's willingness to follow and understand stunting prevention efforts. Maternal knowledge is an indirect factor causing stunting because it influences the type of food given to children and also plays a role in understanding food intake, health, and nutrition [5].

Attitude is the readiness to respond consistently, either positively or negatively, to an object or situation. Attitude reflects an individual's tendency to act in response to a particular stimulus or object. Attitudes involve reactions that are influenced by a person's opinions and emotions, so they are not actions or activities themselves, but rather tendencies to carry out certain actions or behaviour. Factors such as age, occupation, education, and parity can influence a person's attitude. If a mother has a negative attitude, then her actions and behaviour tend to be negative too, which can cause nutritional problems in children [6], [7].

Health education is an activity or effort to convey health information to the public, individuals, or groups so that they can gain better health knowledge [8]. This knowledge is expected to influence their behaviour. In other words, through health promotion, it is hoped that there will be behavioural changes in the target audience. To achieve health promotion goals, the health education process requires interesting and appropriate educational media [9]–[11].

Manajemen Nutrisi Balita Stunting (MNBS) Smartphone Application is one of the development of specific nutritional interventions. Manajemen Nutrisi Balita Stunting (MNBS) smartphone application is an electronic media-based stunting prevention effort. This application contains details about the specific nutritional intervention program for the first 1000 days of life which is displayed with complete features, language that is easy to understand, and is equipped with pictures that improve the mother's understanding [3], [4], [12]. With this application, it is hoped that mothers can monitor their toddler's growth independently, and quickly find out if there is a worsening or improvement in the stunting

condition. Therefore, this study aims to analyze the effect of Manajemen Nutrisi Balita Stunting (MNBS) on the level of knowledge and attitudes of mothers in preventing stunting.

### **Materials and Methods**

The type of research used in this research is quantitative research using a Quasi-Experimental research design with a one-group pretest-post-test Design approach. The sampling technique was carried out using simple random sampling of 30 respondents. Inclusion criteria for this study include mothers who have children under five with poor nutritional status, have a smartphone, and are willing to participate in the study until completion. The research instrument used a questionnaire. The reliability of the knowledge questionnaire shows a Cronbach's alpha value of 0.791, which is included in the high category, while the reliability of the attitude questionnaire reaches a Cronbach's alpha of 0.89, which is classified as very high. Data were analyzed using univariate and bivariate methods, as well as parametric tests (paired sample t-test).

## **3. RESULTS**

### **Mother's Knowledge Before and After Education Using MNBS Smartphone Application Media in Preventing Stunting**

Based on Table 1, it can be seen that of the 30 respondents, the average knowledge of mothers in preventing stunting before being given education was 5.60 with a standard deviation of 1.221. The lowest score for maternal knowledge before education was 3, while the highest score was 8. After education, the average maternal knowledge increased to 10.77 with a standard deviation of 1.524. The mother's lowest knowledge score after education was 8, and the highest score was 14.

### **Mother's Attitude Before and After Education Using the MNBS Smartphone Application Media in Preventing Stunting**

Based on Table 2, it can be seen that of the 30 respondents, the average attitude of mothers in preventing stunting before education was 31.60 with a standard deviation of 6.911. The lowest score for maternal attitudes before education was 20, while the highest score was 45. After receiving education, the average maternal attitude increased to 51.80 with a standard deviation of 7.690. The lowest score for a mother's attitude after education is 40, and the highest score is 69.

**Table 1.** Mother's Knowledge Before Education Using MNBS Smartphone

Application Media in Preventing Stunting

| Variable  | N  | Mean  | SD   | Min-Max | 95% CI      |
|---|----|-------|------|---------|-------------|
| Mother's Knowledge Before Education Using MNBS Smartphone Application Media in Preventing Stunting    | 30 | 5,70  | 1,22 | 3-8     | 5,14-6,08   |
| Mother's Knowledge After Education Using the MNBS Smartphone Application Media in Preventing Stunting | 30 | 10,87 | 1,52 | 8-14    | 10,25-11,43 |

**Table 2.** Mother's Attitude Before Education Using the MNBS Smartphone Application

Media in Preventing Stunting

| Variable  | N  | Mean  | SD    | Min - Max | 95% CI      |
|---|----|-------|-------|-----------|-------------|
| Mother's Attitude Before Education Using the MNBS Smartphone Application Media in Preventing Stunting | 30 | 32,60 | 6,955 | 20-45     | 29,02-34,18 |
| Mother's Attitude After Education Using the MNBS Smartphone Application Media in Preventing Stunting  | 30 | 53,80 | 7,790 | 40-69     | 48,93-54,67 |

**The Effect of Education Using the MNBS Smartphone Application Media on Mothers' Knowledge in Preventing Stunting**

Bivariate analysis was carried out to assess the effect of using the MNBS Smartphone Application as an educational medium on mothers' knowledge of preventing stunting, both before and after the intervention. In this research, bivariate statistical analysis uses a two-sample paired test, namely the paired sample t-test. Based on Table 3, the statistical test results show a value of  $p = 0.000$  with  $\alpha = 0.05$  ( $p < \alpha$ ), which shows that there is a significant influence of using the MNBS Smartphone Application as an educational medium on mothers' knowledge in preventing stunting in Geneng District, Ngawi Regency.

**The Influence of Education Using the MNBS Smartphone Application Media on Mothers' Attitudes in Preventing Stunting**

Based on Table 4, the results of statistical tests using paired sample t-tests show a value of  $p = 0.000$  with  $\alpha = 0.05$  ( $p < \alpha$ ). This shows that there is a significant influence of using the MNBS Smartphone Application as an educational medium on mothers' attitudes toward preventing stunting in Geneng District, Ngawi Regency.

**Table 3.** The Effect of Education Using the MNBS Smartphone Application Media on Mothers' Knowledge in Preventing Stunting

| Variable  | N  | Mean  | SD    | Min-Max | p-value |
|---|----|-------|-------|---------|---------|
| Mother's Knowledge Before Education Using MNBS Smartphone Application Media in Preventing Stunting    | 30 | 5,70  | 1,223 | 3-8     | 0,000   |
| Mother's Knowledge After Education Using the MNBS Smartphone Application Media in Preventing Stunting | 30 | 10,87 | 1,526 | 8-14    |         |

**Table 4.** The Influence of Education Using the MNBS Smartphone Application Media on Mothers' Attitudes in Preventing Stunting

| Variable  | N  | Mean  | SD    | Min-Max | p-value |
|---|----|-------|-------|---------|---------|
| Mother's Attitude Before Education Using the MNBS Smartphone Application Media in Preventing Stunting | 30 | 32,60 | 6,955 | 20-45   | 0,000   |
| Mother's Knowledge After Education Using the MNBS Smartphone Application Media in Preventing Stunting | 30 | 53,80 | 7,790 | 40-69   |         |

#### 4. DISCUSSION

Stunting is a form of growth failure (growth faltering) caused by prolonged nutritional deficiencies, starting from pregnancy to 24 months of age. This condition is exacerbated by a lack of adequate growth (catch-up growth) [3], [4]. Children who experience stunting have low body weight and height compared to children their age. Delayed growth in stunted children can be caused by various factors, including lack of prenatal visits, poor economic conditions, poor environmental sanitation, and inadequate nutritional requirements for toddlers. Reducing the prevalence of stunting in toddlers is one of the priorities in national development, so appropriate steps are needed to increase the growth of stunted toddlers. One important approach to increasing the growth of children under five is nutritional management through specific nutritional interventions [3]

One of the factor's causing stunting is maternal knowledge. The role of parents, especially mothers, is very important in fulfilling children's nutrition because children need parental attention and support in facing very rapid growth and development. To get good nutrition, parents need good nutritional knowledge so they can provide a balanced menu of choices [4]. A person's level of nutritional knowledge influences attitudes and behaviour in preventing stunting through food choices. A mother who has a poor attitude towards monitoring nutritional status will greatly influence stunting prevention measures, namely

*The Use of Manajemen Nutrisi Balita Stunting (MNBS) Smartphone Application as an Educational Media on Maternal Knowledge and Attitudes in Preventing Stunting in Geneng District Ngawi Regency* lacking in fulfilling the child's nutritional status and finding it difficult to choose nutritious food for the child [1].

Exposure to information about stunting and nutritional needs through the MNBS Smartphone Application educational media allows mothers to access and follow the information independently. Research conducted by Sharon Mickan (2013) stated that application technology increases patient involvement through independent monitoring [13]. Manajemen Nutrisi Balita Stunting (MNBS) Smartphone Application is an electronic media-based stunting prevention effort. By using Manajemen Nutrisi Balita Stunting (MNBS) Smartphone Application, mothers can independently monitor their toddler's growth and quickly find out whether there is an improvement or decline in nutritional status. The Smartphone Application for Manajemen Nutrisi Balita Stunting (MNBS) contains several contents including: 1) monitoring child growth 2) the concept of stunting 3) specific nutritional interventions according to age, and 4) a balanced nutritional menu to increase child growth [3], [4]. Through educational media, the Smartphone Application for Manajemen Nutrisi Balita Stunting (MNBS) can provide changes in several aspects of behaviour, namely knowledge and attitudes in providing appropriate nutritional patterns as an effort to prevent stunting in children. In this research, 30 respondents received education using the educational media smartphone application Manajemen Nutrisi Balita Stunting (MNBS), which showed that there was an increase in mothers' knowledge and attitudes in preventing stunting in Geneng District, Ngawi Regency. Description of research results from Karoline Villinger (2019) supports the results of this study, which show that smartphone applications used as educational media can effectively change health-related behaviour [14]. Current smartphone applications in educational media are considered very effective because they can be applied in real-life situations and directly.

## **5. CONCLUSION**

There is an influence of using the Manajemen Nutrisi Balita Stunting (MNBS) Smartphone Application on mothers' knowledge and attitudes in preventing stunting in Geneng District, Ngawi Regency.

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