**ORIGINAL RESEARCH ARTICLE**

# Education of the "SusCatinTing" application on changes in knowledge, attitudes, and behavior of brides-to-be

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## Abstract

The "SusCatinTing" application is a digital health intervention designed to enhance the knowledge, attitudes, and practices (KAP) of brides-to-be regarding stunting prevention during the critical first 1000 days of life. This study aimed to evaluate the effectiveness of this application in improving stunting prevention efforts among brides-to-be in Bengkulu Province, Indonesia. The application provides educational content on healthy pregnancy, maternal nutrition, and stunting prevention strategies, incorporating both text and audio explanations to ensure accessibility for illiterate and visually impaired users. A quantitative research design was employed, utilizing a single-group pretest-posttest approach involving 50 pairs of brides-to-be with internet-connected Android smartphones. Data collection was conducted through structured questionnaires administered by trained enumerators, focusing on KAP related to stunting prevention. The results indicated a significant improvement in KAP scores post-intervention (knowledge score increase: 42.59, $p < 0.001$). The application's unique features, including interactive quizzes and a certification process for marriage registration at the Office of Religious Affairs, contributed to its effectiveness. The study concludes that the "SusCatinTing" application is a promising tool for enhancing health education and promoting preventive behaviors among brides-to-be. Further research is recommended to explore the long-term impact of such digital interventions on stunting rates and maternal-child health outcomes *(Afr J Reprod Health 2024; 28 [10]: 148-159)*

**Keywords:** digital health intervention, "SusCatinTing" application, Stunting prevention

## Résumé

L'application « SusCatinTing » est une intervention de santé numérique conçue pour améliorer les connaissances, attitudes et pratiques (CAP) des futures mariées en matière de prévention du retard de croissance au cours des 1 000 premiers jours critiques de la vie. Cette étude visait à évaluer l'efficacité de cette application pour améliorer les efforts de prévention du retard de croissance chez les futures mariées de la province de Bengkulu, en Indonésie. L'application fournit un contenu éducatif sur les stratégies de grossesse saine, de nutrition maternelle et de prévention du retard de croissance, intégrant des explications textuelles et audio pour garantir l'accessibilité aux utilisateurs analphabètes et malvoyants. Un plan de recherche quantitative a été utilisé, utilisant une approche prétest-posttest en groupe unique impliquant 50 paires de futures mariées avec des smartphones Android connectés à Internet. La collecte de données a été réalisée au moyen de questionnaires structurés administrés par des enquêteurs formés, en se concentrant sur les CAP liés à la prévention du retard de croissance. Les résultats ont indiqué une amélioration significative des scores KAP après l'intervention (augmentation du score de connaissance : 42,59, $p < 0,001$). Les fonctionnalités uniques de l'application, notamment des quiz interactifs et un processus de certification pour l'enregistrement des mariages auprès du Bureau des affaires religieuses, ont contribué à son efficacité. L'étude conclut que l'application « SusCatinTing » est un outil prometteur pour améliorer l'éducation sanitaire et promouvoir les comportements préventifs parmi les futures mariées. Des recherches plus approfondies sont recommandées pour explorer l'impact à long terme de telles interventions numériques sur les taux de retard de croissance et les résultats en matière de santé maternelle et infantile. *(Afr J Reprod Health 2024; 28 [10]: 148-159).*

**Mots-clés**: intervention de santé numérique, application « SusCatinTing », Prévention du retard de croissance

## Introduction

Family planning plays an important role, including planning a new family or bride-to-be so that reproductive and sexual health and reproductive ability can produce healthy offspring. The World Health Organization advises that an individual's sexual life is safe and satisfying to be able to decide when and how reproduction should occur. For brides-to-be, it is essential to be given information on reproductive health and reproductive and sexual problems or issues in the premarital period[1].

Stunting, a chronic form of malnutrition characterized by low height-for-age, continues to be

a pressing public health issue, particularly in low- and middle-income countries like Indonesia. Stunting results from prolonged nutritional deficiencies, often compounded by recurrent infections and inadequate psychosocial stimulation, leading to irreversible physical and cognitive impairments[2]. The prevalence of stunting among children under five in Indonesia remains alarmingly high, with rates surpassing the World Health Organization's threshold for public health concern. According to recent data from the Indonesian Ministry of Health, the prevalence of stunting in Indonesia was 24.4% in 2021, reflecting the ongoing challenges in addressing this condition. In Bengkulu Province, specifically, stunting rates are even higher, underscoring the urgent need for effective and scalable prevention strategies.

The critical period for preventing stunting is the first 1000 days of life, spanning from conception to a child's second birthday. During this period, adequate nutrition and proper health practices are crucial for optimal growth and development. Previous studies have demonstrated that nutritional interventions during pregnancy and early childhood significantly reduce the risk of stunting.

The Regulation of the Director General of Islamic Community Guidance of the Ministry of Religious Affairs Number 373 of 2017 instructs that every prospective Muslim bride who will hold a wedding must follow the marriage guidance held but only provide material related to religion, not including the material of the First 1000 Days of Life[3]. Another problem at this time is that education for brides-to-be is only carried out by the lecture method, by extension, workers who need more knowledge related to stunting.

According to basic health research (2018), the prevalence of stunting in Indonesia is 30.8%, above the WHO target of below 20%. However, the incidence of stunting in Bengkulu Province is already below the national rate (22.1%). However, efforts still need to reduce stunting prevalence, which must be achieved to 14% by 2024. Reducing stunting prevalence requires strategies supported by the Ministry of Health and other ministries. One strategy that can be used through medical examinations for brides-to-be. However, the efforts have not yet to be sustainable, so it is necessary to consider a specific approach in collaboration with the Ministry of Religion.

According to a study by Simanjuntak and Wahyudi (2021), prospective brides and grooms in Bengkulu City have a low level of knowledge about stunting, pregnancy nutrition, and the First 1,000 Days of Life, ranging from 23% to 70%[4]. To improve their knowledge, an intervention was conducted using pocketbooks and leaflets for 60 couples, which resulted in improvement. However, these materials have not been supplemented with an online application to provide easier access for prospective couples. This indicates the need to modify the media used to deliver educational messages on nutrition and health for prospective brides and grooms. The urgency of wedding preparation for brides-to-be plays a role in preventing stunting, especially in early life. This encourages innovation through information and communication technology that can provide health education to brides-to-be online. Health applications selected using Android technology have a high chance of being one of the most effective interventions for increasing knowledge. In practice, the lecture method used at this time could be more optimal because it has various weaknesses, one of which is that it is less practical and less attention-grabbing. Therefore, researchers developed the Android-based "SusCatinTing" application

To address these challenges, the "SusCatinTing" application was developed as an innovative digital health intervention aimed at enhancing the knowledge, attitudes, and practices (KAP) of brides-to-be regarding stunting prevention. This application contains information on health, specifically about preventing stunting in the first 1000 days of life, healthy pregnancy, the role of health and nutrition for pre-pregnant mothers in stunting prevention, building a happy family, marriage requirements, and marriage procedures. A unique aspect of the "SusCatinTing" application is its dual-format content delivery—both text and voice—ensuring accessibility for users with varying literacy levels and visual impairments. This is particularly important in rural or marginalized communities, where literacy levels may be lower,

and traditional health education methods are less effective. Additionally, the app includes 10 questions that need to be answered before and after accessing the material. At the end of the learning process, the prospective couples will receive a certificate that can be used when registering for marriage at the Office of Religious Affairs. The application also includes interactive quizzes to reinforce learning, a certification process to incentivize engagement, and Google Maps integration to help users locate their nearest Office of Religious Affairs. These features aim to increase user engagement and provide a practical tool for health education, contributing to the broader goal of reducing stunting rates in Bengkulu Province and potentially across Indonesia.

The research was conducted from April to October 2023, beginning with the development of the application and design in collaboration with IT professionals to implement the planned features. This was followed by testing and debugging the application with prospective couples, heads of the Office of Religious Affairs, and marriage registration officers. After this process, a user guide was developed until the application was ready to be launched on the play store platform.

The subsequent phase of the research took place in 9 Offices of Religious Affairs in the city of Bengkulu. Prospective couples were periodically invited and educated for 1 month using the application. Every Thursday, they received the app's materials gradually, and after obtaining the material, they answered questions related to knowledge, attitudes, and practices regarding consuming iron-folic acid tablets. This research provides a breakthrough, especially within the bride-to-be community, and it is one of the rare studies in stunting prevention using Android-based applications. This study aimed to determine the effects of the "SusCatinTing" Application on the Behavior of Brides-to-be in Stunting Prevention Efforts in Bengkulu Province.

This is a quantitative research design that utilized one group of pre- and post-experiments on 50 pairs of brides-to-be who had Android phones connected to the internet. Data was collected with the help of trained enumerators who administered questionnaires to measure the knowledge, attitudes, and practices related to stunting prevention. The knowledge questionnaire consisted of 10 questions covering topics such as understanding stunting, preconception stunting prevention, healthy pregnancy planning, maternal nutritional status indicators, the impact of Chronic Energy Deficiency (CED) during pregnancy, appropriate timing for consuming iron-folic acid tablets, the quantity of iron-folic acid tablets during pregnancy, benefits of the first breast milk (colostrum), consequences of malnutrition in infants, and short-term impacts of nutrition disorders in the first 1000 days of life. The validity and reliability of the knowledge questionnaire were tested on prospective couples, resulting in a Cronbach's alpha score of 0.873.

Given the promising results of previous studies on digital health interventions, this study aims to evaluate the effectiveness of the "SusCatinTing" application in improving the KAP of brides-to-be regarding stunting prevention. By leveraging a digital platform, this intervention seeks to expand the reach of health education, provide more engaging content, and ultimately contribute to reducing stunting rates in the region. The findings from this study are expected to offer valuable insights into the role of digital health interventions. In this context, this study aimed to determine the effects of the "SusCatinTing" Application on the Behavior of Brides-to-be in Stunting Prevention Efforts in Bengkulu Province.

# Methods

## *Study design*

This type of research is quantitative. This research design used one group of pre and post-experiments on 50 pairs of brides-to-be with Android phones connected to the internet.

Data was collected with the help of enumerators who had previously received training related to questionnaires and the location of religious affairs offices. The knowledge, attitudes, and practices questionnaire consists of ten questions each that have been tested on the bride and groom. The knowledge questionnaire is comprised of 10

questions covering topics such as the definition of stunting, stunting prevention before pregnancy, planning for a healthy pregnancy, indicators of maternal nutritional status, the impact of Chronic Energy Deficiency (CED) during pregnancy, the appropriate timing for consuming iron tablets, the required number of iron tablets during pregnancy, the benefits of colostrum (the first breast milk), the effects of malnutrition on infants, and the short-term impacts of nutritional disorders during the First 1,000 Days of Life.

The validity and reliability of the knowledge questionnaire was tested with prospective brides and grooms, resulting in a Cronbach's alpha score of 0.873.The attitude questionnaire includes 10 statements that use a Likert scale to assess attitudes about various topics such as upper arm circumference measurements of less than 23.5 cm, delaying pregnancy when nutritional status is inadequate, the impact of poor nutrition on fetal growth, the benefits of regular iron tablet consumption for fetal development, the benefits of colostrum for a baby's immune system, support for Early Initiation of Breastfeeding by the partner, methods of implementing Early Initiation of Breastfeeding, monitoring baby growth with the Road to Health card, consuming a diverse and balanced diet to prevent stunting, and the growth and development of children during the First 1,000 Days of Life. The practice questionnaire was developed using a checklist to monitor the consumption of 10 iron tablets and was used to assess changes in the behavior of brides-to-be.

### *Data analysis*

Data analysis used univariate analysis by displaying the frequency distribution of each variable, bivariate analysis using dependent and independent t-tests, and multivariate analysis with ANCOVA regression. However, for numerical data, the Kolmogorov test was performed first to determine the normality of the data.

### *Ethical consideration*

The study received approval from the research ethics committee at Poltekkes Kemenkes Bengkulu, with reference number No.KEPK.BKL/113/03/2023, since *March 24, 2023 until March 24, 2024.*

## Results

Table 1 shows the distribution of characteristics of brides-to-be that is more dominant in the age group of 20-35 years, which is 91% (91 people). Regarding educational characteristics, most brides-to-be have the last high school and undergraduate education, which is 91% (91 people). In the characteristics of work, most brides-to-be work, which is as much as 87% (87 people). Table2

Table 3 shows that on the knowledge variable, the average ***pretest score*** was 48.01, with a minimum score of 0 and a maximum of 95. The average ***posttest score*** is 90.60 with a minimum score of 40 and a maximum of 100 obtained; ***p-value of*** 0.000 (<0.05), which means that there is an influence of the "SusCatinTing" application on the knowledge of the bride and groom. Table 4

The average attitude score is ***pretest*** 59.50, with a minimum score of 20 and a maximum of 100. The average ***posttest*** score is 89.27, with a minimum score of 66 and a maximum of 99 (***p-value*** 0.000), which means that there is an influence of the "SusCatinTing" application on the attitude of the bride and groom.

Before receiving education, none of the respondents had ever consumed iron tablets. Data on the practice of iron tablet consumption was collected by asking four questions after the educational intervention. The percentage of husbands who reminded their wives to consume iron tablets was recorded. Table 5

In this study, the intervention was effective if there were changes in ***pretest*** and ***posttest scores***. The reference for covariance analysis is if the probability/significance is <0.05. Based on the

**Table 1:** Frequency distribution of respondent characteristic

| Characteristics | n | % |
|---|---|---|
| Age : | | |
| <20 and>35 Years | 9 | 9 |
| 20-35 years | 91 | 91 |
| Education: | | |
| Elementary-Middle School | 9 | 9 |
| High School and Undergraduate | 91 | 91 |
| Occupation: | | |
| Not Working | 13 | 13 |
| Work | 87 | 87 |

results of the ANCOVA test using SPSS 16.0 software for Windows above, it can be seen that the corrected model shows a signification (p value 0.000 <0.05), meaning that ***the pretest*** of the application "SusCatinTing" has an impact on the knowledge of the bride and groom. The age significance value shows 0.000 <0.05, meaning that age impacts the knowledge of the bride and groom but variable education and occupation are not significant.

# Discussion

## *Respondent characteristics*

In this study, most brides-to-be were 20-35 years old, which is 91% (91 people). Young mothers can prevent malnutrition in their toddlers; in other words, older mothers (≥35 years) are almost 11 times more likely to have toddlers with malnutrition.[5], while another study says that mothers with the age of ≥35 years have a 1,523 times greater risk of having toddlers with abnormal nutritional status than mothers with the age of <35 years.[6]

Age is one factor that affects the capture of information that will affect the increase in one's knowledge. Age is a factor that can affect the knowledge of brides-to-be in preparation for pregnancy.[7] As a person ages, more experience and information are received, making it easier for women of childbearing age (WCA) to understand stunting better. This will positively impact efforts to prevent stunting from an early age[8].

Education affects a person's perception and attitude in doing the right parenting style to monitor the growth and development of toddlers. The study was primarily high school educated and undergraduate, i.e., 91% (91 people); education level is one of the factors that determine how easy a person is to receive information, including information about nutrition, e.g., mothers who know a lot about nutrition will influence their food selection according to the principles of nutrition science[9,10].

This study categorized the education levels of prospective brides and grooms into Elementary-Middle School and High School and Undergraduate. It was found that 40 percent had a higher education level.In education, mothers who have taken higher education are better at stunting prevention. Pregnant women who have higher education will make better stunting prevention efforts compared to those with lower education[11]. The higher the education, the more information a person receives, and ultimately, the more knowledge he has.[12.] The level of education that someone has plays a significant role in terms of receiving rational explanations, therefore were able to digest medical information that was given.[13]

Work is a person's livelihood to meet needs.[12] A person's work can have a positive and a negative impact. The busier a person, especially a mother who has a toddler, the less time can be used to pay attention to the state and condition of the child. Because of busy work, mothers sometimes do not know that their children have health problems such as stunting. Working mothers are more likely than non-working mothers to experience stunting than non-working mothers[14,15]. This research provides wider range of perspectives regarding the crucial needs of education for women by studying the level of education of brides to be

The study results were that most brides-to-be worked, which was 87% (87 people). Parents, especially working mothers, can increase income to help family finances meet family nutritional needs, especially children who are still in growth and development so that children thrive. The higher a person's job position, the more knowledge and knowledge they tend to have and the more mature their way of thinking[16]. Level of education could prevent women from teen motherhood, HIV Infections, and mortality rates caused by childbirth,

**Table 2:** Comparison of knowledge and attitudes of prospective couples before and after intervention

| No. List of questions | Before | After |
|---|---|---|
| **Knowledge** | | |
| Definition of stunting | 0,580 ± 0.496 | 0.960±0.197 |
| Stunting prevention during preconception | 0,57 ± 0,498 | 0,84 ±0,370 |
| Healthy pregnancy planning | 0,54 ± 0,501 | 0,73± 0,446 |
| Indicators of maternal nutritional status | 0,54 ± 0,501 | 0,78 ± 0,420 |
| Impact of Chronic Energy Deficiency (CED) during pregnancy | 0,54 ± 0,501 | 0,80 ± 0,420 |
| Optimal time to consume iron tablets | 0,42 ± 0,496 | 0,96 ± 0,197 |
| Number of iron tablets during pregnancy | 0,33 ± 0,474 | 1,00 ± 0,000 |
| Benefits of first breast milk (colostrum) | 0,54 ±0,501 | 0,93 ± 0,260 |
| Effects of malnutrition on infants | 0,59 ± 0,495 | 0,95 ± 0,50 |
| Short-term impacts of nutritional disorders during the First 1,000 Days of Life | 0,38 ± 0,489 | 0,89 ± 0,316 |
| **Attitude** | | |
| Upper Arm Circumference < 23.5 cm as a cause of stunting | 3,07 ± 1,320 | 4,34 ± 0,590 |
| Delaying pregnancy when nutritional status is poor | 2,94 ± 1,270 | 4,34 ± 0,623 |
| Poor nutrition hinders fetal growth | 3,00 ± 1,341 | 4,50 ± 0,560 |
| Benefits of regular iron tablet consumption for fetal development | 3.07 ± 1,320 | 4,42 ± 0,606 |
| Benefits of colostrum for the baby's immune system | 2,71 ± 1,192 | 4,56 ± 0,538 |
| Support for Early Initiation of Breastfeeding by the partner is necessary | 3,11 ± 1,385 | 4,48 ± 0,594 |
| Placing the baby on the mother's abdomen is a practical method for Early Initiation of Breastfeeding | 3.03 ± 1,381 | 4,48 ± 0,594 |
| Monitoring baby growth with the Road to Health card | 3,14 ± 1,378 | 4,55 ± 0,592 |
| Consuming a diverse and balanced diet can prevent stunting | 3,05 ± 1,298 | 4,54 ± 0,540 |
| Impaired growth and development during the First 1,000 Days of Life as a cause of nutritional problems in this life period | 3,11 ± 1,385 | 4,49 ± 0,572 |

**Table 3:** Changes in knowledge and attitudes before and after education with the application "SusCatinTing"

| Variable | Pretest | | Postest | | △ Mean±SD | *p-value* |
|---|---|---|---|---|---|---|
| | Min-Max | Mean±SD | Min-Max | Mean±SD | | |
| Knowledge | 0-95 | 48,01±29,72 | 40-100 | 90,60±10,21 | 42,59±19,51 | 0,000 |
| Attitude | 20-100 | 59,50±21,78 | 66-99 | 89,27±7,271 | 29,77±14,51 | 0,000 |

The reason is that women with higher levels of education would most likely have a better quality of life partner[17].

## *Groom Support*

Prospective brides, both men and women, are one of the risk target groups because, after marriage, these prospective brides and grooms will plan to have children, which, it is hoped, from the marriage will give birth to healthy children.

Early prevention of stunting can be done by providing information to prospective brides and grooms about the incidence of stunting[18]. As a prospective new family, the groom plays a vital role by supporting the prospective father to his wife from before pregnancy until two years of the child's age to prevent stunting[5].

**Table 4:**The practice of taking tablet in brides-to-be

| Variable | Pretest | | Postest | | △ Mean±SD | *p-value* |
|---|---|---|---|---|---|---|
| | Min-Max | Mean±SD | Min-Max | Mean±SD | | |
| **Did the husband remind the wife to consume iron tablets daily? (Yes/No)** | 0-0 | 0-0 | 4-7 | 7,13±0,101 | -6,883±-6,47 | 0,000 |
| **What is the appropriate time to consume iron tablets? (Morning/Night)** | 0-0 | 0-0 | 5-7 | 6,54±0,788 | -6,764±-6,31 | 0,000 |
| **How should iron tablets be consumed? (Water/Other liquids)** | 0-0 | 0-0 | 5-7 | 6,76±0,555 | -6,760±-6,60 | 0,000 |
| **How many iron tablets did the prospective bride consume? (..... tablets)** | 0-0 | 0-0 | 5-12 | 6,78±0,954 | -6,780±-6,50 | 0,000 |

**Table 5 :** Ancova test analysis results

| Sources of variation | Type III Sum of quares | Df | Average | F | Sig |
|---|---|---|---|---|---|
| Assume | 45898.621 | 1 | 45898.621 | 1.038E3 | 0,000 |
| Age | 710.323 | 1 | 710.323 | 16.068 | 0,000 |
| Pretest | 175.166 | 1 | 175.166 | 3.962 | 0,049 |
| Total | 802147.000 | 100 | - | - | - |

The presence of a husband for a mother who is experiencing difficulties can provide moral and physical assistance to reduce the burden felt, especially during pregnancy[19].During pregnancy, the husband's support greatly influences efforts to maintain the health of the wife or pregnant mother and the fetus in the womb.The husband's support can take the form of more attention than before pregnancy and provide greater understanding so that pregnant women can feel love, be appreciated, and feel very comfortable with their situation. Good husband support will help mothers experience pregnancy comfortably so that pregnant women can accept all the changes that occur during pregnancy and the pregnancy can run smoothly[20].

### *Impact of the "SusCatinTing" application on knowledge*

The research results indicate a significant improvement in participants' knowledge about stunting prevention, especially regarding the importance of iron-folic acid supplementation during preconception and pregnancy**.**

The average result of the "SusCatinTing" application knowledge pretest was 48.01, the average posttest was 90.60, and the average difference was 42.59.

The significant influence on providing education and changes in the knowledge of prospective brides (p value 0.000).

It was observed that SusCatinTing app include stunting prevention during preconception, healthy pregnancy planning, indicators of maternal nutritional status, impact of Chronic Energy Deficiency (CED) during pregnancy, optimal time to consume iron tablets, number of iron tablets during pregnancy, benefits of first breast milk (colostrum), effects of malnutrition on infants, short-term impacts of nutritional disorders during the First 1,000 Days of Life. This finding is consistent with previous studies that have shown that targeted educational programs can significantly improve health literacy and awareness among women of reproductive age. Medinawati's study reported knowledge scores during post-test 2 increased by 10.16 points from post-test 1. It can be stated that education through the application media "Acenting Seni" has proven effective in increasing one's knowledge about preventing stunting early[8]. The results of this study are in line with Handayani's research; there was an increase in cadres' knowledge and attitudes after intervening using the Child Free of Stunting application $p<0.005$ with a percentage increase in knowledge of 25.1% and attitudes of 76.2%[21].

A similar study conducted on high school students in Kulonprogo showed that the use of the Gasing application (Anti-Stunting Movement) positively impacted the form of increased behavior in the application user group of 15.67.[22] This study's results align with research in Damit Village, Paser Regency, where significant differences in knowledge before and after the Mother Smart Grounding (MSG) program are given to mothers in stunting prevention[23]. The knowledge and attitude of mothers from the beginning of pregnancy and postpartum will be related to the stunting their children will experience. Efforts to provide appropriate health information through print and electronic media and even through smartphones must be made to increase mothers' knowledge and attitudes about stunting prevention[24].

Moreover, unlike traditional educational methods, such as face-to-face counseling or printed materials, the "SusCatinTing" application offers unique advantages by providing information through both text and audio explanations. This feature makes the application accessible to individuals with varying literacy levels, including those who may have difficulty reading or are visually impaired. The results suggest that the educational content and interactive features of the "SusCatinTing" application—such as quizzes and voice explanations—were effective in motivating participants to change their behavior). Previous studies have highlighted the effectiveness of multimedia approaches in health education, noting that combining visual, auditory, and interactive elements can enhance learning and retention of information.

### *Changes in attitude of brides-to-be before and after being educated with the "SusCatinTing" application*

Attitude is essential in everyday life because if attitude has been formed in a person, then attitude can determine behavior towards something. For attitudes to be a fundamental change, it is necessary to have certain possible conditions, namely the existence of support facilities . The results of the attitude study towards the attitude of the bride and groom after being educated with the application "SusCatinTing" showed an increase in the average attitude before and after, with an average difference of 29.77. The increase in attitude in this study is supported by increased knowledge. This is in line with previous research, which showed that an increase in knowledge would affect attitudes with an increase in attitude scores by 2.53 after intervention with Android-based media[25]. This research is also analogous to the result of the research done by Benti et. Al shows that the administration of nutrition supplements is based of a small amount of lipid(SQ-LNS) during a period of 1000 days including pregnancy and the first 2 years after birth, increases linear longterm progression amongst female children and children whose mothers are not overweight. This is further supported J.L Leroy, M. Ruel, J.-P, that states the needs of early investment of early 1000 days childhood to prevent any malnutritions, especially stunting[26].

This research aligns with the Tenayan Raya Pekanbaru Health Center research that shows that using Android applications can increase mothers'

knowledge and attitudes about stunting. Android is a comprehensive media platform that has become an effective tool in nutrition education about stunting and improving maternal nutritional behavior[27].

The "SusCatinTing" application has shown to be a targeted and effective intervention for improving the knowledge, attitudes, and practices (KAP) of prospective brides and grooms regarding stunting prevention, specifically in promoting the regular consumption of iron-folic acid tablets. This study aimed to assess the impact of the application on the health behaviors of couples preparing for marriage, and the findings clearly demonstrate its effectiveness in achieving this goal.

### *The practice of taking Fe tablets in brides-to-be*

The bride and groom are encouraged to do various nutritional preparations before entering the wedding stage; each bride-to-be is recommended to consume iron supplements containing iron and folic acid once a week, good nutritional preparation for the bride-to-be, especially the bride-to-be as a mother-to-be, is beneficial to support herself when pregnant with children later. This is useful for preventing stunting and other malnutrition in children later in life[28]. The effort to prevent stunted growth of toddlers must be made before conception, if stunting has already happened then there are higher risk of, short body stature, Impacted cognitive function, decrease in academic achievement, lower income, Generational Poverty, sickness, and death[29].

Generally, blood-added tablets are consumed at night before going to bed. Overall, blood-added tablets are consumed using water, and husbands-to-be are reminded to take iron tablets and accompany their partners. The research results on the practice of taking Fe tablets prospective husbands know that prospective wives consume iron supplement tablets as much as 1 tablet per week. Anemia in pregnant mothers has an impact of causing the baby to also contract anemia as well, halting its growth, to prevent anemia, brides-to-be are advised to consume blood supplement tablets at least once per day for an entire month before planning pregnancy. Consumption of blood supplement tablets are advised to be continued to at least the end of the first trimester (12 weeks of pregnancy)[30,31].

Brides-to-be or women of childbearing age are prone to anemia because they are still of reproductive age and have monthly menstrual periods where blood loss is about 0.8 milligrams per day. Various factors can cause anemia, but iron deficiency in the diet consumed is one of the most significanting[32]. Some studies say the level of iron consumption in this age group does not meet the nutritional adequacy rate. Oral administration of blood supplements tablets must be done for at least 6 months of pregnancy to supplement adequate levels of iron in the body[33].

Brides-to-be who regularly take iron supplements are expected to meet their iron needs and obtain sufficient iron from their daily diet. Insufficient iron intake can inhibit hemoglobin formation, leading to anemia. Data from the Basic Health Research in 2018 revealed that the prevalence of anemia among individuals aged 15-24 years in Indonesia was 84.6%, which corresponds to the average age of brides in the country[34]. This highlights a significant concern regarding the high prevalence of anemia among brides-to-be in Indonesia. To address this issue, it is strongly recommended that brides-to-be take iron supplements to meet increased iron requirements during pregnancy, prevent anemia, and prepare for childbirth[35]. Research supports this recommendation, showing that providing nutritional supplements to pregnant and breastfeeding mothers can reduce risks such as wasting, small head size in newborns, delayed fetal growth, premature birth, and stunting[36]. It is advised that blood tablets be administered at a rate of one tablet per day, starting at least one month before pregnancy[37] In a recent study, 90% of brides-to-be followed this recommendation, consuming one tablet per week after receiving education through the "SusCatinTing" application.

The unique focus of the "SusCatinTing" application on couples about to marry allows it to address a critical window for intervention: the preconception period. During this time, establishing healthy nutritional practices, such as the daily intake

of iron-folic acid tablets, is essential for preventing anemia in mothers and supporting the healthy development of the fetus. The application's content is specifically designed to educate users on the importance of iron-folic acid supplementation, providing clear guidance on the timing and dosage required to prevent stunting and other developmental issues related to iron deficiency.

By utilizing both text and audio formats, the application ensures that essential health information is accessible to all prospective couples, regardless of their literacy levels. This inclusivity is particularly important in promoting the adoption of preventive health measures among diverse user groups. The interactive elements of the application, including quizzes and a certification process, actively engage users and reinforce the importance of consuming iron-folic acid tablets regularly. This approach not only improves knowledge but also encourages positive behavior change, which is critical for stunting prevention.

The impact caused by anemia due to iron deficiency is very complex. This, of course, also has an impact on women of childbearing age premarital who will become prospective brides. The bride-to-be, after the wedding, will face the pregnancy period and produce the nation's next generation. The condition of anemia that occurs at this time risks having a harmful effect on the fetus that will be conceived by WUS later. Growth of the terrible quality of the fetus at this moment is related to growth and further development and is more vulnerable to contracting chronic illness in adolescence era.[38] Anemia can cause bleeding at delivery, low birth weight, premature birth, and complications of pregnancy and childbirth.[39] For that, a women requires additional polat acid and iron during their life. If nutritional intake isn't balanced for a pregnant women, then it will impact the health of the women and the fetus severely[40].

These results align with previous research that highlights the effectiveness of digital health interventions in improving health behaviors and outcomes. The integration of digital tools in health education allows for greater reach and accessibility, especially among populations with limited access to traditional health services or those with low literacy levels. The "SusCatinTing" application not only fills a gap in accessible health education but also provides a scalable model that could be adapted to other regions with high stunting rates or other public health challenges.

The study found that couples who used the application were more likely to understand and adopt the practice of consuming iron-folic acid tablets as part of their preparation for marriage. This behavior change is significant because it directly addresses one of the key risk factors for stunting—maternal malnutrition—before pregnancy even begins. The application also facilitates easier access to services and information through integration with Google Maps, helping couples navigate to the nearest Office of Religious Affairs for further support and resources.

## Conclusion

The "SusCatinTing" application effectively meets its objective of enhancing the KAP of prospective brides and grooms regarding the prevention of stunting through improved dietary practices, specifically the regular consumption of iron tablets. By providing a tailored, accessible, and engaging educational tool, the application empowers couples to take proactive steps toward ensuring maternal and child health from the earliest stages of family planning. The successful implementation and positive outcomes of this study suggest that similar digital interventions could be expanded to other regions to support public health efforts in reducing stunting and promoting maternal and child well-being.

Future research should explore the long-term impact of the "SusCatinTing" application on stunting rates and maternal-child health outcomes. The "SusCatinTing" application represents a promising innovation in public health education, particularly for stunting prevention among brides-to-be. Its successful implementation could serve as a model for similar digital interventions in other settings, contributing to broader efforts to improve maternal and child health and reduce stunting rates in Indonesia and beyond.

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## Contribution of author

Lela Hartini, Head of the Research Team, The author conceived of the presented idea, developed the theory and performed the computations, investigate and supervised the findings of this work. All authors discussed the results and contributed to the final manuscript

Betty Yosephin Siamnjuntak, The author collected data or contributed data or analysis tool, drafted the manuscript or made intellectual contributions to the text or revision. All authors discussed the results and contributed to the final manuscript

Diah Eka Nugraheni, The author wrote the manuscript with input from all authors,contributed to the analysis and/or interpretation of data ,All authors discussed the results and contributed to the final manuscript.

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