INFLUENCE OF COUNSELING APPLICATIONS ON IMPROVING THE BALANCING NUTRITIONAL KNOWLEDGE FOR PREGNANT WOMEN

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ABSTRACT

Pregnant women must have high nutritional needs. If daily consumption tends to irregular and food is not good, it may cause malnutrition in pregnant women. To support pregnant women, eating a healthy and balanced diet should be practiced to prevent malnutrition. Besides, education through counseling as a preventive behavior is also needed to increase nutritional intake quality during pregnancy. One of the efforts to provide nutritional counseling requires nutrition education that individuals or pregnant women can obtain. So that health and nutrition problems experienced can be resolved. Increasing the knowledge of pregnant women related to improving their health is through the counseling obtained. Therefore a counseling application was created with the name "TanyaBidan." This study used a quasi-experimental (one group pre-test and post-test design) by conducting a pre-test before and after the intervention the application to 72 pregnant women. The research was conducted in January 2021. Data were collected through pre-test and post-test using a questionnaire and analyzed by the Wilcoxon test. Based on the results of the pre-test, most of them had poor knowledge (93%). The results of the post-test showed that most of them had good knowledge (99%). The Wilcoxon Signed-Rank Test analysis results in a p-value of 0.000 <0.05. There was an increase in knowledge of balanced nutrition in pregnant women during the pre-test post-test with the "TanyaBidan" application.

Keywords: Counseling, Tanya Bidan Application, Knowledge, Pregnant Women.

I. INTRODUCTION

Nutritional problems are related to malnutrition in pregnant women, nursing mothers, newborns, and children aged two years in the first 1000 days of life (The first 1000 days of life)(Zedadra et al., 2019). The Republic of Indonesia's Health-development in the 2015-2019 period is focused on four priority programs, one of which is reducing maternal and infant mortality (Ernawati et al., 2017).

According to Basic Health Research (Riskesdas) 2018, the prevalence of pregnant women in Indonesia's chronic energy deficiency was 17.3%. Pregnant women with anemia increased from 2013, namely 37.1% to 48.9%(Zedadra et al., 2019). In developing countries, including Indonesia, the main public health problem is nutrition. Indirect causes of maternal and child mortality can still be prevented. During pregnancy, nutrients are needed to grow reproductive organs(Mey et al., 2020). Indicators by measuring nutritional status can be seen from the upper arm's circumference. A threshold value of the upper arm circumference with the risk of Chronic Energy Deficiency is 23.5 cm. Chronic Energy Deficiency in pregnancy can be prevented if the upper arm circumference is ≥ 23.5 CM in the initial of pregnancy(Kesehatan et al., 2019). Determination of other nutritional
status is also considered from calculating BMI in pregnant women, whose nutrition is normal if they have a BMI of 18.5 to 24.9 kg/m² during pregnancy (Kemenkes RI, 2015).

As for the benefits of balanced nutrition in pregnant women, namely: 1) The need for nutrients and the fetus can be met, 2) Normal nutritional status can make pregnancy run well and safely, 3) Network for fetal growth and development of maternal health, 4) Pregnancy can be resolved, 5) Mothers get good energy for the continuation of the quality of breastfeeding after the baby is born (Noe & Lubis, 2019). Eating habits - good food also contains sufficient carbohydrates and protein sources that can support and are closely related to the baby's birth weight (Saimin et al., 2019).

In the first trimester, pregnant women experience morning sickness, nausea, vomiting, and decreased appetite, which results in pregnant women experiencing malnutrition. Entering the second trimester, the feeling of nausea and vomiting begins to decrease. However, nutritional needs are increasing because the fetus's growth is accelerating from the first trimester. Protein intake in pregnant women must increase and be fulfilled because protein and calories form the placenta, amniotic fluid, and increase blood volume to have flowed throughout the body. Whereas in the third trimester, the fetus grows enlarged, and the nutritional needs of pregnant women increase, the iron intake such as supplements should be under the supervision of a midwife or doctor during pregnancy. Another mineral needed is iodine. Its function is to form thyroxine compounds, which are useful for controlling cell metabolism (Maiti & Bidinger, 1981).

Nutritional needs of pregnant women are carried out by observing the quality of the completeness of nutrients which various types of food sources can influence. Of the various types of food consumed by pregnant women, the easier it is for their nutritional needs to be met (Saimin et al., 2018). Using the right method in providing education is an important process in order to achieve the expected goals. The right method provides a more effective impact to achieve goals. According to (Pepi Hapitria, 2017), providing education with various methods will be more effective to increase knowledge for the community, especially pregnant women. Efforts or activities help individuals, groups, and communities implement health education to improve both knowledge and behavior to achieve an optimally healthy life (Pepi Hapitria, 2017). Counseling helps the counselee get constructive information and grow independently (Sari, 2016). Users need that way applications with counseling to get important information about the needs for nutritional knowledge needed.

(Hartanto, 2016) Suggest several factors that cause android applications to become popular, among others: a. The speed factor is an easy way for users to quickly access the required data to precisely calculate application efficiency; b. Productivity aspects with all the problems encountered in everyday life can be resolved with the right application with various applications; c. User-friendly design creativity is divided based on user adjustments based on age, education, and running mobile activities for users; d. Flexibility and reliability that are marketed only for specific purposes.

Researchers presented counseling in the form of an application. It contains a video of a balanced nutrition menu, articles on nutrition, dietary restrictions, especially a chat feature for users to conduct counseling with the midwife in charge of the application.

The counseling method in health education is the best approach to help individuals overcome their health problems. In general, counseling also aims to make the counselee aware of their health problems after recognizing and realizing the problem, leading to the ability to overcome the problems they get (Bara et al., 2015). Satisfaction with the health information provided to the community is lacking. It makes them look for other information sources, fulfilling their knowledge of balanced nutrition for pregnant women. Several studies in China show that the media has become a very important health knowledge source (Pepi Hapitria, 2017). In the end, all counseling presentations will be tested in an experimental study with a counseling application media called the "Tanya Bidan" Application.

II. MATERIALS AND METHODS

Research Site and Design

This research was conducted at the Padongko Public Health Center (PUSKESMAS), Barru Regency. The type of research used was the Combination Method between research and development method with the quasi-experimental method.
**Population and Sample**

This study's population was 97 pregnant women in the working area of PUSKESMAS Padongko, Barru Regency, based on data of October 2020. About 72 people were involved as the sample, which was chosen by purposive sampling.

**Collecting Data**

The instruments used in this study were the android application of nutrition counseling media for pregnant women, the Technology Acceptance Model (TAM) questionnaire used to assess the utility of the Media Validation questionnaire application and materials, and a questionnaire increase nutritional knowledge in pregnant women. Questionnaires were used to assess and respond to the effectiveness of the product being developed.

**Data Analysis**

Data processing was performed using a computerized method with the SPSS (Statistical Product and Service Solution) program - version 25. Univariate analysis was used to determine the frequency distribution table, while bivariate analysis was used to determine the effect of counseling applications on increasing knowledge of pregnant women's balanced nutrition. The data analysis technique used the Wilcoxon signed Rank Test. The Wilcoxon Signed Rank Test was used to determine pregnant women's knowledge regarding balanced nutrition before and after being given a counseling application. If \( \rho \) value <0.05, there would be differences in knowledge before and after the intervention was given. A non-parametric statistical test from the Wilcoxon Signed Rank Test would apply if not normally distributed in paired groups.

### III. RESULT

1. **Characteristics of Respondents**

This analysis was aimed to describe the respondents' characteristics, such as age, education level, and employment status.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 - 20 years</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>21 – 35 years</td>
<td>60</td>
<td>83</td>
</tr>
<tr>
<td>36 - 40 years</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>41 – 42 years</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>72</td>
<td>100</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary School</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Junior High School</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Senior High School</td>
<td>45</td>
<td>63</td>
</tr>
<tr>
<td>Diploma</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Bachelor degree</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td>Postgraduate</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>72</td>
<td>100</td>
</tr>
<tr>
<td><strong>Occupation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Working / Housewife</td>
<td>56</td>
<td>78</td>
</tr>
<tr>
<td>Entrepreneur</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td>Civil servants</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>72</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Primary Data 2020
From Table 1, it can be seen the results of the frequency distribution of respondent characteristics. Most respondents were aged 21 - 35 years, as many as 60 people (83%) with more education levels in Senior High School with 45 people (63%). Most respondents did not work or housewife in terms of work, with 56 people (78%).

2. Knowledge Level Assessment

Knowledge Before and After being given a Counseling Application

Table 2. Knowledge Distribution of Pre Test & Post Test

<table>
<thead>
<tr>
<th>Category</th>
<th>Pre-test</th>
<th>Post-Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Good</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Sufficient</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Less</td>
<td>67</td>
<td>93</td>
</tr>
<tr>
<td>Total</td>
<td>72</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 2 shows the respondents' knowledge before and after being given a counseling application. The number of respondents' knowledge before being given the application was five pregnant women (7%) were sufficient, and 67 pregnant women (93%) were less. After the counseling application was given, there was a change in the respondent's level of knowledge. The number of respondents or pregnant women in the good category was 71 pregnant women (99%), only 1 pregnant mother (1%).

IV. DISCUSSION

1. Characteristics of Respondents

a. Age

The results showed that most pregnant women were in the age group of 21 - 35 years, as many as 60 pregnant women (83%). This age plays an important role in a person's comprehension and thinking patterns. As getting older, the thinking and perceptive power will also develop to be obtained properly. The age of respondents still in the productive limit. They have sufficient knowledge about nutritional needs during pregnancy, wherein this study is still productive. However, pregnant women's nutritional knowledge is still at most in the low category (Apriliani et al., 2019).

Age also influences pregnancy and childbirth. A woman is said to be physically ready if she has passed body growth, namely at the age of 20. This age can be a guideline for physical readiness and at the age of 20-35 years is physical readiness for pregnancy (Effendi, Makhfudi, 2009).

b. Education

The result showed that most pregnant women had a Senior High School level with 45 pregnant women (63%). About six pregnant women (8%) were in elementary school. About six pregnant women (8%) were in Junior High School, four pregnant women (6%) were in Diploma. Ten pregnant women (14%) were bachelor degrees and Postgraduate as many as one pregnant woman (1%).

From the research results, the level of education of pregnant women is related to high nutritional knowledge. It is supported by theory (Hasanah et al., 2013); the higher the education, the higher knowledge, but someone with insufficient knowledge is not necessarily low educated.

Education can be done through outreach activities through the distribution of messages orally or in writing. Then it generates confidence, so that people are not only aware, know, and understand, but also interested and can carry out a suggestion related to the education obtained. This extension can also be done using the latest methods and media (Nugroho, 2012).
c. Occupation

The results showed that the most occupation was housewives with 56 pregnant women (78%). Respondents who worked as entrepreneurs were ten pregnant women (14%). The lowest number was a civil servant job consisting of 6 pregnant women (8%).

According to (Asiyah 2010), the theory in the research results that work in general is an activity that can take up much time so that a person or several people will affect their lives.

2. Application Development

The development of the Tanya Bidan counseling application media is a medium that is very feasible to increase pregnant women's knowledge on balanced nutrition. The Tanya Bidan counseling application is an online learning media, where this application discusses counseling on nutrition for pregnant women. This application can be accessed via the browser or Play Store for android users.

The Tanya Bidan application media can provide material information about balanced nutrition for pregnant women. It delivers the daily meals for pregnant women, including the video of advantages and disadvantages of balanced nutrition and articles on balanced nutrition for pregnant women, and dietary restrictions during pregnancy. Following are the results of the media design for a balanced nutrition counseling application for pregnant women:

a. The process of starting using the application for users

b. Application content

c. The steps of responsible users (midwives)
3. Application Usage

The instrument used in this study to analyze application users' behavior was the Technology Acceptance Model (TAM) questionnaire. (Dwitama, 2008) Stating to research and measure the factors influencing a person's decision by accepting or rejecting information technology is TAM.

Based on the assessment on small-scale field tests and large-scale field tests using the Technology Acceptance Model (TAM) questionnaire, all aspects contained were included in the very good category. The questionnaire aspects included perceived ease to use (PE) or convenience, perceived usefulness (PU) or benefits, attitude toward (AT) or attitude, behavioral intention (BI) or desire, and actual usage (AU) or user awareness to get a score that. These results indicated that pregnant women could very well receive the Tanya Bidan counseling application.

4. Knowledge Level

This study revealed that counseling about pregnant women's balanced nutrition using an application effectively increased pregnant women's knowledge. The results obtained were the number of respondents' knowledge before being given the application with a sufficient category of 5 pregnant women (7%), less than 67 pregnant women (93%). After being given the counseling application, the number of respondents or pregnant women in the good category was 71 pregnant women (99%), only 1 pregnant mother (1%). So it can be concluded that there were differences in knowledge before and after counseling applications about balanced nutrition for pregnant women were given.

Tanya Bidan's applications were easily accessible, and the mother's interest in obtaining information support this knowledge. The counseling media application named Tanya Bidan in this study was developed with Android-based smartphone technology. This application consisted of 4 discussion materials in the main menu about balanced nutrition for pregnant women. In line with (Ekayanti & Suryani, 2019), the impact of pregnant women's low nutritional status during pregnancy can cause various mother and baby problems. This nutritional need is closely related to the low level of knowledge of pregnant women about nutrition. Therefore, it can show that increasing the knowledge of pregnant women, including the nutrition of food consumed, is very important by paying attention to pregnant women's condition.

V. CONCLUSION AND SUGGESTION

Using the Tanya Bidan application, showed knowledge of pregnant women before being given a different application after being given application. The application's information included general knowledge about balanced nutrition for pregnant women, a meal menu, or a one-time meal that an internet network can access.

Based on the assessment aspect, the user behavior analysis of the application showed very good category results, so that this application declared very feasible to be used to increase pregnant women's knowledge about balanced nutrition. So, it can be concluded that Android-based counseling applications significantly affect increasing knowledge of balanced nutrition for pregnant women.

It suggests that pregnant women with the Tanya Bidan counseling application can further increase knowledge about the importance of knowing pregnant women's optimal balanced nutrition.

REFERENCES