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The Effect of Android Application-Based Education Empowerment on Adolescent Knowledge for Stunting Prevention in Madrasah Aliyah Amanatul Ummah Surabaya, Indonesia

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ABSTRACT Data Riskesdas 2018, menunjukkan 25,7% remaja usia 13-15 tahun mengalami stunting dan 26,9% remaja stunting berusia 16-18 tahun, hal ini disebabkan ketidaktahuan pemenuhan dan pemahaman anak remaja tentang pola makan, kesehatan remaja, kebutuhan gizi. menurut WHO, upaya pencegahan stunting dapat dimulai sejak usia muda. Aplikasi Android merupakan salah satu media edukasi dengan menyampaikannya melalui media digital, salah satu upaya adalah melalui penggunaan media aplikasi android terhadap pengetahuan remaja terhadap pencegahan stunting. Jenis penelitian Quasi-Experimental dengan satu kelompok pre-test post-test rencana penelitian. Populasi 80 remaja di Pondok Pesantren Madrasah Aliyah Unggul Amanatul Ummah Surabaya dengan teknik purposive sampling berjumlah 35 remaja. Variabel independen adalah penggunaan aplikasi android. Variabel dependen adalah pengetahuan tentang pencegahan stunting pada remaja putri. Instrumen penelitian adalah kuesioner dengan 20 pertanyaan tentang pencegahan stunting dan teknik analisis data dengan Wilcoxon Sign Rank Test dengan $\alpha = 0,05$. Hasil penelitian menunjukkan bahwa sebelum intervensi diberikan, sebagian besar (62,9%) remaja putri kurang memiliki pengetahuan tentang stunting sedangkan setelah intervensi terjadi peningkatan hampir semua (82,9%) remaja putri memiliki pengetahuan yang baik. Dari hasil analisis diketahui bahwa terdapat pengaruh pendidikan berbasis aplikasi android terhadap pengetahuan remaja putri tentang pencegahan stunting dengan nilai p sebesar 0,001 $p < \alpha$ (0,05). Adanya peningkatan pengetahuan remaja putri kemungkinan disebabkan oleh proses transfer informasi pendidikan, terutama yang disediakan melalui media aplikasi android yang dianggap menarik, cepat diterima, jelas, dan mudah diakses. Sehingga terjadi peningkatan pengetahuan remaja putri tentang pencegahan stunting setelah diberikan intervensi edukasi melalui aplikasi android.

INDEX TERMS Stunting, Application, Youth, Knowledge.

I. INTRODUCTION

A person's life cycle goes through many stages. at every stage of the human nutritional intake process. Toddlers and adolescents are the two stages of development that go through the fastest. Therefore, it is very important to meet the nutritional needs of these two stages. The environment, the adolescent's own activities, psychological state and stress

level, the disease conditions experienced, and the use of drugs are just a few variables that can change the nutritional needs of adolescents. The lifestyle and diet of young individuals, as well as their physical growth and energy requirements, are usually directly related to their nutritional problems. Teenagers may face nutritional problems such as eating problems including obesity, chronic energy deficit

(KEK), micronutrient deficiencies, anemia, and also loss of appetite. (Direktorat Jenderal Kesehatan Warga, 2019).

Stunting is a rapidly growing problem, and there are several causes of stunting. Lack of understanding about diet and adolescent health is one of the causes. According to the National Poverty Reduction Acceleration Team (TNP2K, 2018), stunting is a condition in which toddlers (children under the age of five) fail to grow and develop due to ongoing inflammation and chronic malnutrition, especially in the first 1,000 days of life (HPK). Mother's height (short), distance between pregnancies, the mother is still small, and inadequate nutritional intake during pregnancy are factors that can affect pregnancy (Departemen Kesehatan, 2018). According to Riskesdas statistics for 2018, 26.9% of children aged 16 to 18 years and 25.7% of children aged 13 to 15 years were stunted. Pregnancy and young adult marriage carry significant risks. Due to their immaturity on a physical and psychological level, youth under the age of 18 (2017) Sri Medina. Low energy consumption, history of inflammatory disorders. Several factors contribute to stunting, including body weight, low birth weight, mother's education level, and household economic level. (Hadi et al., 2019). Adolescent malnutrition can result in inadequate nutrition, which causes psychomotor, cognitive, and social problems. In addition, there are clinically recognized developmental limitations, one of which is body size that is younger than actual age (dwarf) (Febriani et al., 2018).

Stunted adolescents have higher rates of disease, delayed language, motor and cognitive development, poor posture, poor reproductive health and poor school-age learning skills. Government policies to reduce stunting are based on this influence. Indonesia's Sustainable Development Goals (SDGs) continue to prioritize reducing the incidence of stunting, with a target of halving the proportion of stunted children under five by 2030 (Kemenkes RI, 2018, WHO World, 2018). Stunting can be avoided throughout the adolescent stage of the life cycle. Stunting can be avoided by being aware of adolescent nutrition, especially with regard to young women. Early stunting instruction is very important as an introduction to starting the preconception phase. Teenagers can learn important knowledge through health education (Puspitaningrum et al., 2017). Focusing on the family and providing special care for adolescents who are not exclusively breastfed are important components of an effective stunting prevention strategy. Increasing knowledge about clean and healthy living behavior (PHBS), eating a balanced diet, stopping smoking, stopping using drugs, and stopping free sex all function to reduce stunting in adolescents. (Promosi Kesehatan, 2020).

To avoid modification, the Indonesian government has prioritized providing special nutrition for young women and women who are about to become mothers for blood booster pill supplements (Sekretariat Presiden Republik Indonesia, 2021). It is customary to give adolescent girls (rematri) iron

pills at a dose (60 mg elemental iron and 400 mcg folic acid) or 1 tablet every week for 52 weeks (1 year).

II. METHOD

This type of research is experimental with quasi-experimental methods using a one group pre-test posttest design approach. This research was conducted at MAU Amanatul Ummah Surabaya in February - April 2023. The population in this study is all X class female students who are still active as students of MAU Amanatul Ummah Surabaya N = 80 students. The sample in this study is a sample that meets the inclusion criteria, the sample size in this study was 35 female students. This study used a simple purposive sampling technique. The independent variable is the use of the android application. The dependent variable is knowledge about stunting prevention in adolescent girls. In the data collection process, this study uses primary data types with instruments in the form of questionnaires that This research goes through several stages of data processing including the process of editing, scoring, coding, data entry to data cleaning. Where in analyzing it through two stages, namely in the form of univariate and bivariate analysis have been tested for validity and reliability by researchers. The statistical test in data analysis in this study is the normality test using the Kolmogorov smirnov test, while analytical tests are carried out with Wilcoxon Sign Rank Test through SPSS statistical software. So that the difference between pretest and post test will be obtained $\alpha = 0.05$. The hypothesis (H_a) will be accepted if the value of p -value obtained from the calculation of statistical tests is smaller than 0.05 ($p < \alpha$). This research has also gone through a series of worthy research ethics including providing informed consent to respondents to maintaining the confidentiality of research respondent data.

III. RESULT

The purpose of this study is to increase the knowledge and attitudes of adolescents towards stunting, the efforts made require a holistic and sustainable approach. With appropriate education, adolescents can be agents of change in preventing stunting and promoting healthy eating patterns in the community, the samples taken in this study are categorized according to age as [TABLE 1](#) distribution to respondents below

TABLE 1

| Distribution of Respondent Characteristics | | | |
|--|----------|---------------|----------------|
| Characteristics | Category | Frequency (n) | Percentage (%) |
| Age | 15 years | 12 | 34.3% |
| | 16 years | 23 | 65.8% |
| | Amount | 35 | 100% |

[TABLE 1](#) it shows that the frequency distribution of general data from research on the influence of android media applications on young women's knowledge about stunting

prevention results from the characteristics of respondents based on age. It can be seen that almost half of the respondents (34.3%) are 15 years old, and it is known that some respondents (65.85) are 16 years old.

TABLE 2

Frequency Distribution of Respondents' Knowledge Levels About Stunting Prevention before Android Application-Based Intervention

| Knowledge level | Before | |
|------------------|---------------|----------------|
| | Frequency (n) | Percentage (%) |
| Good Knowledge | 4 | 11.5% |
| Enough Knowledge | 9 | 25.8% |
| Less Knowledge | 22 | 62.9% |
| Total | 35 | 100% |

Based on **TABLE 2** most of the respondents had sufficient knowledge before carrying out the intervention using the Android application media (25.8%), less knowledge before being given education using the Android application media as much (62.9%), good knowledge before being given education using the application media android (11.5%).

TABLE 3

Frequency Distribution of Respondents' Knowledge Levels About Stunting Prevention After Android Application-Based Intervention.

| Knowledge level | After | |
|------------------|---------------|----------------|
| | Frequency (n) | Percentage (%) |
| Good Knowledge | 29 | 82.9% |
| Enough Knowledge | 3 | 8.6% |
| Less Knowledge | 3 | 8.6% |
| Total | 35 | 100% |

Based on **TABLE 3** most of the respondents had sufficient knowledge after being given an intervention using the Android application media as much as (8.6%), less knowledge after being given an intervention using the Android application media as much as (8.6%), good knowledge after being given education using the application media android (82.9%).

TABLE 4

Effect of Respondents' Knowledge Before and After Given the Android-Based Stunting Prevention Educational Application.

| | n | (Min- Max) | Median | Means | std. Deviation | p |
|-----------------|----|---------------|--------|-------|-------------------|---------|
| Prior Knowledge | 35 | 9 – 20 | 5 | 13.11 | 4.14 | < 0.001 |
| After Knowledge | 35 | 9 – 20 | 5 | 18.74 | 3.15 | |

Based on **TABLE 4** a significant value was obtained < (0.001). Thus, there is an effect of using educational

applications on Android-based stunting prevention to increase adolescent knowledge.

IV. DISCUSSION

1. KNOWLEDGE LEVEL OF YOUNG WOMEN ABOUT STUNTING PREVENTION PRIOR TO GIVING USING ANDROID APPLICATION MEDIA.

Based on the research findings, it is known that the majority of respondents need more precise information before receiving Android application media. This ignorance is caused by young women who need more information about stunting prevention. This can be observed in the detailed statistics, which show that most of the respondents are probably more knowledgeable. Knowledge can affect a person's impression of a situation and action. Both in formal and informal settings (both inside and outside the classroom), education is an effort to shape lasting personality and abilities. Education influences learning; one can learn more easily the more educated they are. A person with education often learns from other people and the media. When more information is accessible, a person gains greater knowledge about health [1]. One of the factors that influence knowledge is age. As you get older, your understanding and reasoning will improve. In addition, as individuals age, they acquire more mature knowledge, life experiences, emotions, and opinions. (Notoatmodjo, 2014). As you get older, your understanding and perspective will grow, making what you get even bigger. 2018 (Notoatmodjo).

This research is in line with research (Elfiza Fitriami, 2021) which shows how Android application-based education can increase youth's understanding of stunting prevention. (Fitriami and Galaresa, 2021). According to research (Rudy Hartono, 2018), social media-based education can increase knowledge through increasing the knowledge capacity of adolescents. Researchers argue that a person's knowledge is influenced by several factors, including age. A person in his prime had powerful knowledge and abilities. Age can have an impact on one's understanding and perspective. The level of thinking will further advance with age.

Besides that, there are educational factors, education also plays an important role in knowledge and perception of something. Education has the authority to influence a person's lifestyle, determine goals, and achieve these goals. Someone will start the learning process through education and will manage or use something that is considered appropriate for him, including knowledge about stunting prevention. The higher the education, the higher the knowledge a person will have. Based on the theory and data that have been obtained by researchers there is harmony because the older you are, the more mature and more mature your level of thinking will be. As well as with higher education there is a significant influence between the

respondents' knowledge of Android application-based education about stunting prevention.

2. KNOWLEDGE LEVEL OF YOUNG WOMEN ABOUT STUNTING PREVENTION AFTER BEING GIVEN ANDROID APPLICATION MEDIA

Based on the results of this study, shows that after being given education using the Android application media, almost all of the respondents experienced an increase in knowledge, namely good knowledge about stunting prevention.

Knowing something is the result of trying to understand something, which occurs when one does object sensing. The five senses that a person has sight, hearing, smell, taste, and touch are used to detect something. Humans primarily learn something through their senses of sight and hearing [2]

Predisposing factors are individual or community attributes that influence behavior before or during that behavior (Murti, 2018). To increase youth awareness of stunting prevention initiatives, health education is needed regarding this condition. Educational media and tools can be used to communicate educational content and messages effectively while attracting the attention of the intended audience (Notoatmodjo, 2014).

In [3] In 2012, Sadiman said that video can stimulate sight and hearing by following psychomotor and cognitive principles so that viewers can obtain information through their sense of hearing, namely ears, and sight, especially the ability to understand the information conveyed. maximum. This is in line with research [4] which found that educational animated films for children and the use of Android media applications in the form of modules with short, clear, and simple sentences that are simple enough for teenagers to understand have an impact on pre-test and post-test results. test. The causes and consequences of stunting are now better understood among adolescents. Characteristics of respondents such as name and age support the factors that might influence the increase in knowledge in this study. Many respondents in this study were between 15 and 17 years old, which could have an impact on how respondents decide how to care for themselves because as they get older, they gain more experience, knowledge, and access to information resources, and younger people are better at providing intervention. Educational background is another factor that influences how knowledgeable the respondent is. This shows how teenagers can quickly adapt to new situations and ideas. Knowledge is what humans get from using their five senses to know or feel. Identification is assisted through five human locations consisting of the senses of sight, hearing, smell, taste, and contact. Most of human knowledge comes from sight and hearing. Information can be estimated through tests, meetings, or surveys regarding material that needs to be measured by the subject regarding knowledge of stunting prevention. A

person's actions can be shaped by the domain of knowledge [2]

Based on the results of the research using the Wilcoxon data test, it supports the results of the Amanatul Ummah Superior Madrasah Aliyah study which shows that counseling with application techniques affects stunting understanding. The increase in respondents' knowledge was due to the additional information they obtained thanks to the help of the "Gasing" Android application. Knowledge or cognition as explained by [2] Based on the description above, it can be concluded that there has been an increase in the knowledge of young women about stunting prevention. Young women are expected to be wise in using smartphones. Providing education using this Android application is expected to provide opportunities for changing the behavior of young women.

3. THE EFFECT OF PROVIDING EDUCATION WITH ANDROID APPLICATION MEDIA ON ADOLESCENT KNOWLEDGE IN STUNTING PREVENTION MEASURES

The recorded rating test scores show significant results based on a statistical comparison of knowledge before and after receiving health education through Android media applications using the Wilcoxon test. This indicates that Android media applications for health education have an impact on adolescent awareness of stunting prevention strategies.

One of the health education media is using the Android application media. Providing education regarding stunting prevention is very important so that young women can choose the appropriate information. Android application media can increase knowledge about stunting prevention. This can be proven that before and after being given education on Android application media there is an increase in stunting prevention knowledge. The android application has the advantage that it is very practical, this media is digital media that is easily accessible directly, and easy to view anywhere, and the android application media that is in the android application can be reviewed, and read at any time, this android application media is designed with writing, animated Picture.

Given that the material is fast, clear, and easy for teenagers to understand as well as interesting, providing health education through the "Gasing" Android Application technique is considered very successful (S. Ginting, ACR Simamora, 2022). Adolescents' understanding of stunting prevention increases due to the use of Android and video media applications. According to research (Seki and Fayasari 2019), playing educational videos on fruit and vegetable consumption as well as health education techniques has proven effective in increasing adolescents' understanding of a balanced diet. Along with advances in technology and information, the use of social media as a teaching tool is an alternative. This strategy is effective in

health education and takes the form of an Android application consisting of multiple scenes that cannot be folded or stitched anywhere. This Android application is made carefully and is equipped with modules that include graphic animation and animated films using basic language that is short and easy to understand to make it look attractive. Android applications are applications that have short, clear, easy-to-understand language, and basic animated graphics [2]

Utilization of social media in the form of a mobile application for Android that has a scene module with animated graphics and short, clear, and simple words that can be animated. The simplicity and brevity of the Android application media presented is a benefit to be used as a learning tool. Media for Android apps may be released at different times and locations. Recipients are attracted to read it because of its straightforward design. The weakness of the Android application media as a learning tool is that smartphone users can access the information provided. Therefore, if the user does not have the necessary equipment, such as an internet-connected smartphone from the Google Play Store, he cannot access it. This study supports (Zaki and Sari 2019), They find that urban and rural areas use social media to increase knowledge scores. This shows that the use of social media among teenagers has expanded and not only in big cities; Teenagers generally take advantage of social media in rural places as well. Given that children are a sensitive and unstable population, it is very important to create nutritional education media and continue to do so on an ongoing basis. children also need interesting, interactive, and up-to-date information. Based on the description above, the researcher believes that the Android application media is a new modified educational method. The Android application is designed to be as attractive as possible so that readers can easily understand and not get bored. Android applications can be an effective alternative educational media as an effort to increase knowledge about stunting prevention [5].

Increasing knowledge by using Android application media for health education has an impact on the knowledge of respondents both before and after the intervention. The use of Android application media in providing interventions is easily accepted by respondents because the material on the Android application media is designed in an attractive, clear, concise manner according to the core of the material to be delivered so that in providing Health Education with android application media it can influence good knowledge which will form adolescents in improving nutritional status.

Compared to other media, the use of Android applications tends to be acceptable to young women. This is because Android tends to be relevant to the lives of young women today. The assumptions and research results of this researcher are supported and in line with data related to access to media and gadgets that are classified as high

among teenagers. Where is the "Indonesian Internet Service Providers Association (APJII)" in a survey in The year 2018 states that adolescents aged 15-19 years become the highest internet users (Siswantara 2022).

The following are the shortcomings of the study when disseminating Android applications still requires an internet network and can only be accessed 20 times to continue the intervention, researchers must reset through the application maker account as before so that it can be accessed by the next respondent. The number of meetings with respondents was 5 times, namely the first meeting with the provision of pretest questions before education, the second meeting of education with android application media about stunting prevention, the third meeting was hindered because respondents held the fourth meeting UTS exam followed by education with android application media about stunting prevention the second, For the last meeting, which is the fifth with the provision of posttest questions after being educated with Android application media.

V. CONCLUSION

With proper education, adolescents can become agents of change in preventing stunting, this is due to the process of transferring information through application media on the internet, which is considered interesting, quickly accepted, clear, and easily accessible, so as to increase the knowledge of adolescent girls about stunting prevention. Furthermore, with knowledge about stunting prevention, they will be able to promote the health of mothers under five.

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