# Modigiz Application as an Educational Media for Overweight Teenagers

**Retno Wahyuningsih[1]\*, Joyeti Darni[2], Ramadan Wibi Surya Aji[3]**

[1-2]Department of Nutrition, Poltekkes Kemenkes Mataram, Indonesia
[3]Android Developer, West Nusa Tenggara, Indonesia
[1-2]Jl. Praburangkasari Dasan Cermen, Sandubaya Kota Mataram
Telp./Fax. (0370) 633837
[1]\***Email** : khaylilaghina@gmail.com

| Article Info | ABSTRACT |
|---|---|
| | ***Background:*** *Android mobile applications about nutrition and health are starting to be developed, but only a few develop mobile applications with a discussion of overweight adolescents. Android media with exciting features can be an alternative to increase adolescents' awareness of the problem of obesity.*<br><br>***Research Methods:*** *Development of an Android mobile application named "Modigiz," which stands for mobile obesity diet nutrition. The application is developed using the agile software development method and uses its development technology, namely Android Studio, Android SDK, Kotlin, Android Jetpack Library, Github, Figma, and Canva.*<br><br>***Research Result:*** *The Modigiz application implements the principle of quick feedback for application users. Users can find nutritional status information about each feature display, and there is feedback for consultations between users and the team via WhatsApp no.*<br><br>***Conclusion:*** *The Modigiz application was developed for overweight adolescents to monitor their nutritional status and manage their diet independently. In addition, this application also provides nutrition and health information for users, so it is hoped that it can encourage healthy behavior habits and implement balanced nutrition.* |

## BACKGROUND

Being overweight in teenagers is still a health problem whose prevalence is increasing. Data from basic health research in 2013 showed that 26.6% of adolescents aged ≥15 years experienced central obesity, and there was an increase in 2018 to 31%, with the measurement indicator being abdominal circumference. Meanwhile, in West Nusa Tenggara Province, the incidence of obesity in adolescents aged ≥15 years is 25% (Riskesdas, 2018).

If excess weight in teenagers is not treated seriously, it will become obesity. Obesity in adolescents is at risk of causing disease, for example, cardiovascular disorders, diabetes mellitus, and impaired respiratory function (Meidiana, 2018).

The cause of obesity is multifactorial, namely lack of physical activity, excessive food intake, genetics, and lifestyle changes. Food intake is a factor that plays a vital role in the incidence of adolescent obesity. Research conducted by Widyastuti (2016) shows that obese teenagers have saturated fat intake exceeding 7% of total daily energy and fiber intake that does not meet the nutritional adequacy rate (AKG) (Widyastuti et al., 2017). Kartika's (2012) research suggests that most obese groups also have a higher frequency of consuming fast food and snacks than non-obese groups.

Promotion of weight loss and healthy eating behavior in adolescents can be done through health education (Supariasa, 2012). Promoting nutrition education is one of the efforts to prevent overnutrition in adolescents. One form of nutrition education is through counseling to instill the importance of nutrition for

health, eating problems, and how to overcome them, planning meals according to the diet agreed upon by the individual.

Nutrition education uses educational media tools to help smooth the information transfer process. The media can be videos, animations, booklets, flip sheets, or banners. The media used has been widely developed in the wider community, but Android mobile-based media rarely discusses adolescent obesity. Following technological developments that have reached all corners of the country, Android mobile media with attractive features could be an alternative to increase teenagers' awareness of the problem of being overweight.

Android is a Linux-based operating system for mobile phones such as smartphones and tablet computers (PDAs). Android provides an open platform for developers to create applications used by various mobile devices. Android has become the world's most popular mobile operating system (Murya, 2014). Android user data in Indonesia is ranked fifth in the list of most significant smartphone users worldwide.

Based on this description, efforts that can be made to increase the nutritional knowledge of obese adolescents are by providing nutritional education through the features available on the Android mobile "Mobile Obesity Diet Nutrition" (Modigiz) with the hope of improving nutritional conditions for the better and the knowledge gained. It can still be remembered in adulthood. The aim of developing this Android mobile application is as an educational medium for obese teenagers to increase their knowledge and understanding regarding obesity, the dangers of obesity, and food management.

## RESEARCH METHODS

This application development research was carried out in April - June 2023. The application was developed using the agile software development method and uses development technology, namely Android Studio, Android SDK, Kotlin, Android Jetpack Library, GitHub, Figma, and Canva, and works with the Android operating system. This application development uses hardware like an Android smartphone and laptop. The stages of developing the Modigiz Android application are as follows:

## RESULTS

The booklet has dimensions of 155x214 mm with 23 pages. The front is a cover page and table of contents, while the back is a bibliography and back cover page. The contents of the booklet consist of 10 parts, including an introduction, metabolic changes during fasting, consequences of fasting DM patients, grouping and considerations in performing Ramadan fasting, self-checking blood glucose, principles of food regulation, the composition of macronutrients in food, Ramadan plates, carbohydrate settings, meal recommendations, and sample menus. The display of the booklet compiled by the author is presented in Figure 1.
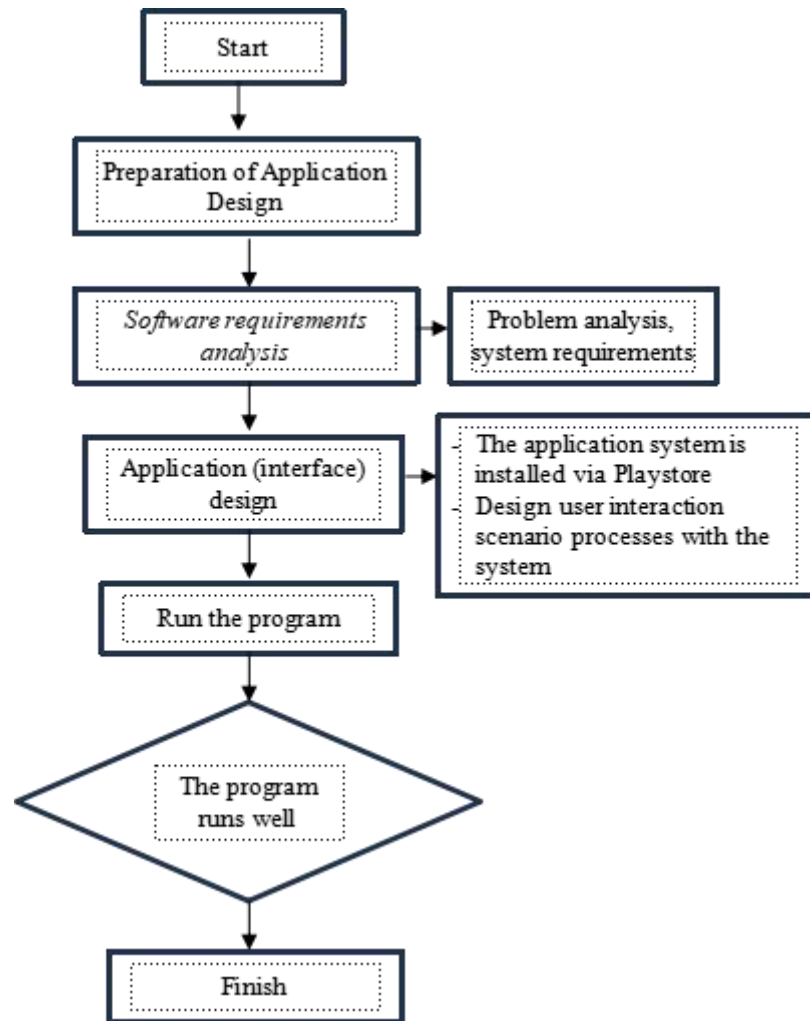
**RESULTS**

      The Android mobile application development "Modigiz" can be downloaded via PlayStore. Users can install or download applications for free via the Play Store. The steps/how to download are as follows:

1. The user opens the Play Store and searches with the keyword "MODIGIZ."
2. At the top, "MODIGIZ" will appear with an image icon, then the user must click "install."
3. If installed, you can do the steps by clicking "Open".
4. The user clicks "enter the application".

The following is the appearance of the Android mobile application "Modigiz":

1. Initial appearance of the application, When you open the application, the following initial screen will appear :



Figure 1. Initial appearance of the application

2. Explanation of the application

The development of the Modigiz application also includes an explanation of the application and the purpose of making the application. The appearance of the application is as follows:
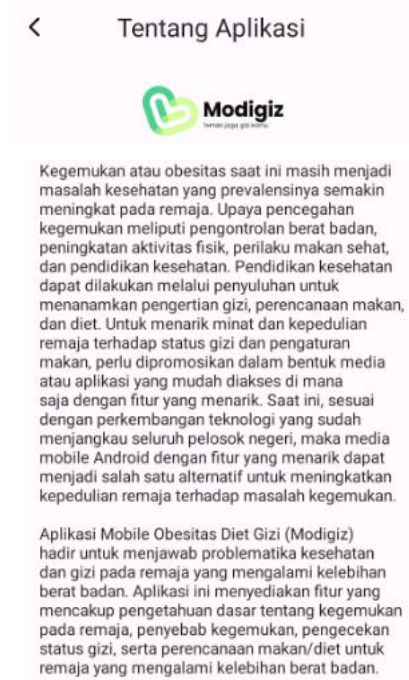


Figure 2. About the Application

3.Application Home

The homepage of the modigiz application displays as follows:



Figure 3. Home Appearance of the Modigiz Application

4.The features provided in the Modigiz application consist of 9 (nine), namely regarding:
a. Understanding Obesity
b. Obesity Type
c. Dangers of Obesity
d. Causes of Obesity
e. Teen Diet Trends
f. Meal Planner
g. Calculating Body Mass Index (BMI)
h. Health and nutrition articles
i. Nutrition consultation

The features of the Modigiz application are as follows:



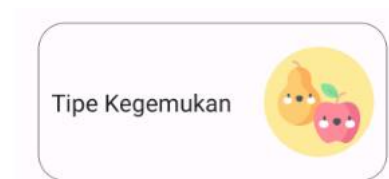Figure 4. Definition of Obesity



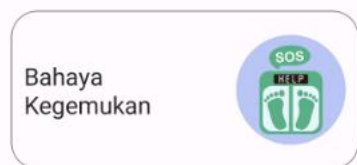Figure 5. Types of Obesity



Figure 6. Dangers of Obesity



Figure 7. Causes of Obesity



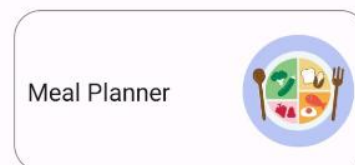Figure 8. Trends in Adolescent Eating Patterns



Figure 9. Meal Planner
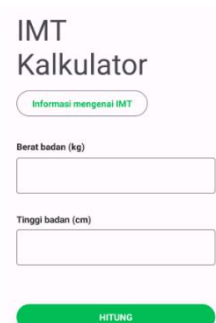


Figure 10. Calculating BMI



Figure 11. Display of calculating BMI

Apart from the main menu, this application also provides additional menus such as health and nutrition articles and nutritional consultations. The display on the additional menu is as follows:
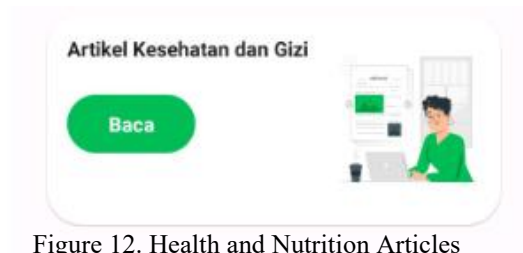
Figure 12. Health and Nutrition Articles



Figure 13. Nutrition Consultation

**DISCUSSION**

The Modigiz Android mobile application provides 9 (nine) features regarding obesity (understanding, types, dangers, causes, dietary trends, meal planner, calculating BMI, health and nutrition articles, and nutrition consultations). The menu features available in the application are presented with additional text narratives in the form of attractive images.

The Modigiz application applies the principle of fast feedback for application users. Users can find their nutritional status and get information about each feature displayed. There is feedback for consultation between users and the team connected via WhatsApp.

The advantage of this application is that users can find their nutritional status by entering weight and height data. The application will display the body mass index (BMI) number and explain the BMI results. When using other applications, there is the WHO application "Anthro Plus," which is used for children aged 5-19 years (WHO, 2009). However, the use of the WHO Anthro Plus application is limited because the application is provided in a desktop/computer version, which requires a computer to access and is challenging to carry everywhere. So, the alternative development of the Android mobile application (smartphone) Modigiz becomes an alternative media used to increase the knowledge of teenagers who are

overweight. With a smartphone, users can access mobile applications without time limits, and wherever they are, users can reach these applications.

Based on the results of Yoswenita's research regarding the influence of Android application-based infographic learning media on the level of knowledge about obesity in young women, it shows that young women experienced an increase in knowledge from 84.27 to 99.03 after being given Android application media intervention regarding obesity. This research shows a p-value = 0.000, meaning that there is an influence of Android applications regarding obesity on knowledge in young women (Yoswenita, 2023). In line with the research of Authorized, it is stated that the use of the Android-based application "EduStunting" can increase teenagers' knowledge and attitudes towards stunting and related factors (balanced nutrition and anemia) with a p-value <0.05 (Resmiati, 2021).

One of the features of this application is a feature regarding meal planning for teenagers or a meal planner. This feature provides food menu planning information that can be applied to teenagers' daily lives. The menu display presented in the application feature is adopted from the researcher's own research (Retno, 2016) regarding the influence of a regular balanced low-energy diet (REST) and creative exercise with elements of sasak (rudat dance) to reduce weight in overweight students at the Health Polytechnic Mataram.

This mobile application also provides features regarding nutritional consultation services, where users can ask questions and answers directly with the development team, who are connected via WhatsApp. This feature service allows users to access nutritional consultation services with researchers.

The development of the Modigiz application can be used as a guide for teenagers to monitor their nutritional status independently and encourage teenagers to be able to regulate their food so that they can prevent themselves from becoming overweight and have a healthy lifestyle.

## CONCLUSIONS

The Obesity Diet Nutrition Mobile Application (modigiz) was developed to address health and nutritional problems in teenagers who are overweight. This application contains features that include basic knowledge about obesity in teenagers, causes of obesity, checking nutritional status, and a diet meal planner for teenagers who are overweight. This application also includes articles related to health and nutrition that can increase teenagers' knowledge. Modigiz has also implemented the feedback principle, so it is hoped that it can attract users' interest in using this application.

## SUGGESTION

The Mobile Obesity Diet Nutrition (modigiz) application needs to add features regarding calculating energy needs and measuring the food's nutritional content. Next, this application can be tested first on users so that they will get suggestions for improvements, and the developer will redevelop it according to user input suggestions. After that, this application can be applied to teenage users who are overweight.

## REFERENCES

Kartika S, Nadhiroh SR. 2012. Differences in Diet and Physical Activity Between Obese and Non-Obetic Adolescents. Makara, Health, Vol. 16, No. 1, Juni 2012: 45-5.

Kemenkes RI. 2018. Basic Health Research 2018. Jakarta: Balitbangkes.

Kemenkes RI. 2013. 2013 Riskesdas Book in Numbers. Jakarta: Health Research and Development Agency.

Meidiana R, Simbolon D, Wahyudi A. The Influence of Education through Audio Visual Media on the Knowledge and Attitudes of Overweight Adolescents. J Health. 2018;9(3):478.

Murya,Yosef. 2014. Black Box Android Programming. Jasakom.

Nathan, B.M., & Moran, A. 2008. Metabolic Complications Of Obesity In Childhood And Adolescence: More than just diabetes, Current Opinion in Endocrinology, Diabetes and Obesity, vol. 15, no. 1, pp. 21–29.

Prasetyaningrum, Y.I, & Yuliati, E. 2020. Evaluation of the Feasibility of Android-Based Applications for Young Women: "NutriHealth". Indonesian Nutrition Science 4(1): 75-86.

Resmiati, 2021. Effectiveness of Android-Based Adolescent Nutrition Education Applications for Stunting Prevention. Endurance Journal: Scientific Study of Health Problems. Volume 6 No 2.

Supariasa IDN. Nutrition Education and Consultation. Jakarta: EGC; 2012.

Wahyuningsih, Retno. 2016. The Effect of a Regular Balanced Low Energy Diet (REST) and Creative Exercise with Sasak Elements (Rudat Dance) to Reduce Weight in Overweight Students at the Mataram Health Polytechnic. Research Result Report of Beginner Lecturers at the Mataram Health Polytechnic in 2016.

WHO. 2009. WHO AnthroPlus for Personal Computers Manual: Software for assessing growth of the world's children and adolescents. Geneva: WHO (http://www.who.int/growthref/tools/en/).

Widyastuti N, Dieny FF, Fitranti DY. Saturated Fat and Fiber Intake in Obese Adolescents Relation to Metabolic Syndrome. Indonesian Journal of Clinical Nutrition. 2016;12(4):131.

Yoswenita, Riasyah. 2023. The Influence of Infographic Learning Media Based on Android Applications on the Level of Knowledge Regarding Obesity in Young Women. Journal of Health Sciences. Vol. 4, no. 2, Februaryi 2023, hlm. 81-86