

The Effect of Video and Leaflet Media on Obesity Prevention Behavior and Diabetes Mellitus Risk among Junior High School Students

Kolompoy A Jane¹, Memah P Herlina², Jean Raule³, Samuel Tambuwun⁴, Aunsi Fretania⁵

^{1,2,3,4,5}Health Promotion Study Program: Poltekkes Ministry of Health Manado

*Corresponding Author: fretaniaaunsi22a@gmail.com

Received: 10 October 2025

Received in revised: 10 November 2025

Accepted: 20 December 2025

Available online: 30 December 2025

Abstract

Obesity is a serious public health problem that contributes to an increased risk of diabetes mellitus (DM) and other non-communicable diseases. Adolescents are a vulnerable group due to unhealthy diets and low physical activity. This study aimed to determine the effect of video media and leaflets on obesity prevention behaviors related to diabetes risk among students at SMP Negeri 10 Manado and SMP Negeri 1 Talawaan. The study used a quasi-experimental design with a two-group pretest-posttest design. A sample of 60 students was randomly selected and divided into two groups: video (30 students) and leaflet (30 students). The research instrument was a questionnaire that had been tested for validity and reliability. Data analysis was performed using an independent sample t-test with a significance level of $\alpha = 0.05$. The results showed a significant difference in obesity prevention behaviors before and after the intervention in both media groups ($p = 0.000 < 0.05$). Video media utilized visual-audio stimuli that captured participants' attention and increased engagement. Meanwhile, leaflets had the advantage of being easy to reread, could be stored, and served as a practical source of information for students.

Keywords: Behavior, obesity, video media, media leaflet

Abstrak (Indonesian)

Obesitas merupakan masalah kesehatan masyarakat serius yang berkontribusi terhadap peningkatan risiko Diabetes Melitus (DM) dan penyakit tidak menular lainnya. Remaja menjadi kelompok rentan akibat pola makan tidak sehat dan rendahnya aktivitas fisik. Penelitian ini bertujuan mengetahui pengaruh media video dan media leaflet terhadap perilaku pencegahan obesitas risiko DM pada siswa SMP Negeri 10 Manado dan SMP Negeri 1 Talawaan. Penelitian menggunakan desain *quasi experimental* dengan rancangan *two group pretest-posttest design*. Sampel berjumlah 60 siswa yang dipilih secara *random sampling*, dibagi menjadi dua kelompok: video (30 siswa) dan leaflet (30 siswa). Instrumen penelitian berupa kuesioner yang telah diuji validitas dan reliabilitas. Analisis data dilakukan menggunakan *independent sample t-test* dengan tingkat signifikansi $\alpha = 0,05$. Hasil penelitian menunjukkan adanya perbedaan signifikan perilaku pencegahan obesitas sebelum dan sesudah intervensi pada kedua kelompok media ($p = 0,000 < 0,05$). Media video memanfaatkan rangsangan visual-audio yang mampu menarik perhatian dan meningkatkan keterlibatan peserta. Sementara itu, leaflet memiliki keunggulan pada kemudahan dibaca ulang, dapat disimpan, dan menjadi sumber informasi yang praktis bagi siswa.

Kata kunci: Perilaku, obesitas, media video, media leaflet

INTRODUCTION

Obesity is a growing global health problem and is a major risk factor for non-communicable diseases, especially type 2 Diabetes Mellitus (DM). Based on WHO data (2022), more than 1 billion people in the world are obese, with the prevalence in children and adolescents quadrupling since 1990¹. In Indonesia, the Indonesian Health Survey (2023) shows that 37.4% of the population aged ≥ 10 years do not do physical activity, with the highest rate in adolescents 10–14 years old (58%). North Sulawesi ranks second in the national obesity prevalence with the proportion of female obesity reaching 64.5%. Based on data from the Indonesian Health Survey (SKI, 2023), North Sulawesi occupies the second highest position in Indonesia with a prevalence of obesity in men of 26% and women of 64.5%². Health promotion media is a means and effort to display information or messages that communicators want to convey with the goal of increasing knowledge to change health behavior for the better. Media commonly used in health promotion can be in the form of visual, audio, or audio-visual media (Intan K, et al. 2022)³.

Video media can be used as an option in health promotion activities because video media is considered effective as an educational medium. Video media has a positive influence on adolescents' knowledge and attitudes. Providing education with videos will activate more senses so that it is easier to understand the information presented (Saragih A and Amalaia L 2022)⁴. Leaflets are the delivery of health messages/information in the form of sentences and pictures through leaflets (Suiraoaka 2004 in Nubatonis 2019)⁵. SMP Negeri 10 Manado and SMP Negeri 1 Talawaan have cases of obesity in their students but are not optimal in the prevention program. This is the basis for research on the influence of video media and leaflets on obesity prevention behaviors at risk of DM in students.

METHODS

Design, place and time

This research uses a design *quasi-experimental* with a plan *Two Group Pretest-Posttest Design*⁶. This method was chosen because it allowed researchers to measure behavioral changes before and after the intervention in two different groups, so that the effectiveness of video media and leaflets could be compared. The location of the research was determined at SMP Negeri 10 Manado and SMP Negeri 1 Talawaan. The selection of this school was based on the high number of students with obesity (SMP Negeri 10 Manado: 59 obese students out of 1009 students; SMP Negeri 1 Talawaan: 15 students are obese out of 80 students) and the obesity prevention program at the school is not optimal. This makes both schools relevant as locations for health education interventions. The research time was held in May–June 2025, chosen because it coincided with the period of active teaching and learning activities, making it easier for researchers to access students for the implementation of pretests, interventions, and posttests sequentially in one series.

Number and method of taking subjects

The number of research subjects was 60 students, which were divided into two groups: 30 students at SMP Negeri 10 Manado (video media intervention group) and 30 students at SMP Negeri 1 Talawaan (media intervention leaflet group). Subjects were selected using random sampling techniques to ensure that each student had the same opportunity to become a respondent, so as to minimize bias and increase the validity of the research results. A total of 30 students per group was set to meet the needs of statistical analysis, where the sample size was already considered adequate in a quasi-experimental design with tests *T-test*. The reason for choosing subjects at the junior high school level is because teenagers of high school age are a vulnerable group of obesity and the risk of diabetes mellitus due to unhealthy diet and lack of physical activity. With early educational interventions, it is hoped that it can form better preventive behaviors.

Types and Methods of Data Collection

The data types in this study consist of primary data and secondary data. Primary data was obtained directly from respondents through filling out a structured questionnaire that had been tested for validity and reliability. The questionnaire included questions regarding respondents' characteristics, and obesity risk prevention behaviors for diabetes mellitus. Secondary data were obtained from the results of interviews and initial surveys. Data collection was carried out by visiting respondents directly at their respective schools. The researcher provides an explanation of the objectives and procedures of the research, then asks the respondents to sign an agreement sheet (*informed consent*). Next, respondents were asked to fill out a pretest questionnaire, then treatment was carried out and finally the respondents filled out a poster questionnaire guided by the researcher to ensure that all questions were answered clearly.

Data processing and analysis

The data collected from the questionnaire is first checked for completeness through the editing process to ensure that no answers are missed or inconsistent. Next, coding, which is the provision of numerical codes for each answer. The data is then entered into the SPSS software through the entry stage, and cleaned to ensure that there are no input errors. The analysis was carried out in two stages, namely:

1. Univariate analysis to describe respondent characteristics and obesity prevention behaviors before and after the intervention.
2. Bivariate analysis used *paired sample t-test* to determine the difference in pretest–posttest scores in each group, as well as *independent sample t-test* to compare the effectiveness of video media and leaflets. The significance level is set at $\alpha = 0.05$.

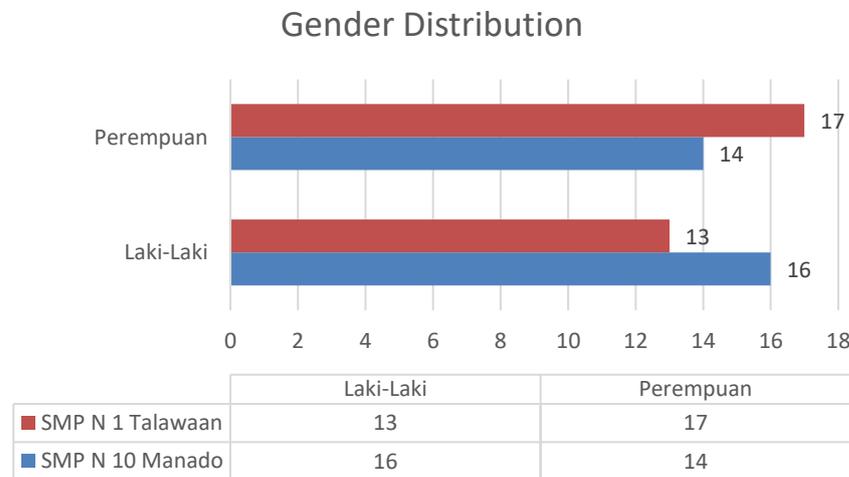
RESULTS AND DISCUSSION

A. RESULTS

This study involved 60 respondents consisting of 30 students at SMP Negeri 10 Manado and 30 students at SMP Negeri 1 Talawaan. Based on gender distribution, the majority of respondents in both schools were male, although there were also female students. The age range of respondents was in the category of early adolescents, in accordance with the level of junior high school education. The distribution of preventive behaviors showed differences in scores before and after the intervention, both in the group given video media and the group given leaflets.

1. Univariate Analysis

Distribution of Frequency of respondents by Gender

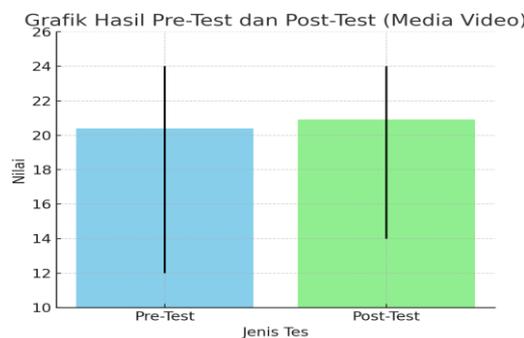


Based on the diagram above, it shows that most of the respondents at SMP Negeri 10 Manado are male 16 (53.3%) while most of the respondents at SMP Negeri 1 Talawaan are female 17 (56.7%).

2. Bivariate Analysis

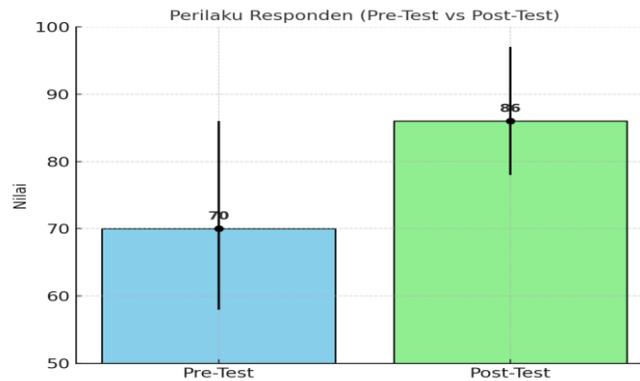
Bivariate analysis is used to look at the difference in the average pre-test score and **Post-test** in each intervention group (video and leaflet). The statistical tests used are Paired T-Test, because the data are paired (before and after the intervention in the same group).

a. Average Distribution Before and After Intervention Using Video Media at SMP N 10 Manado



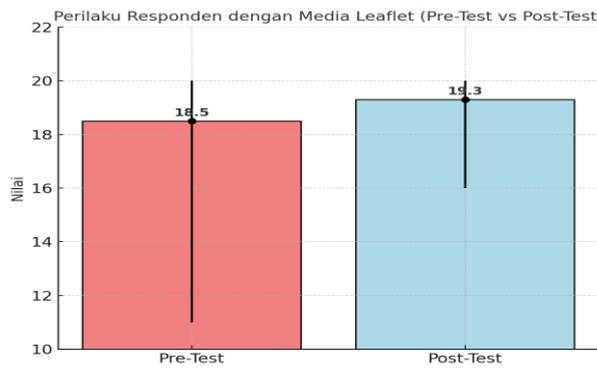
Based on the diagram, it shows that the average value for video media before being given *treatment* is 20.4. After being given *treatment* 20.9.

b. Average Distribution of Respondents' Behavior Before and After Intervention Using Video Media at SMP N 10 Manado



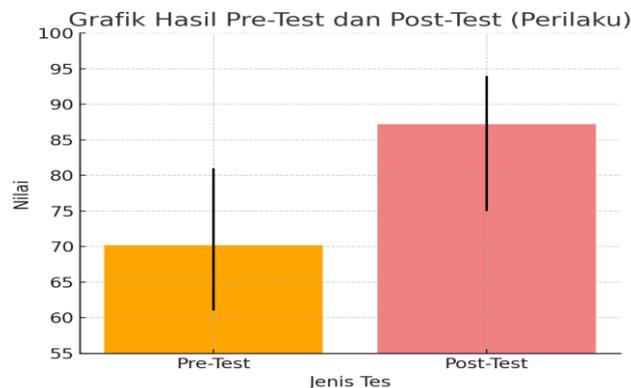
Based on the diagram, it shows that the group showed that the average score for behavior before being given *treatment* was 70. After being given *treatment* 86.

c. Average Distribution Before and After Intervention Using Leaflet Media at SMP N 1 Talawaan



Based on the diagram, it shows that the average value of the leaflet media before giving *Treatment* 18.5. Once granted 19.3.

d. Average Distribution of Respondents' Behavior Before and After Intervention Using Leaflet Media at SMP N 1 Talawaan



Based on the diagram, it shows that the average value of behavior before being given *treatment* is 70.2. After being given *treatment* 87.2.

e. Analysis before and after treatment

Variable	t	df	Sig. (2-tailed)	95% CI of the Difference
Behavior (Pre-Post)	10.089	29	0.000	4.198 – 0.669

The results showed that the results of the independent *T*-test found a significant influence between behavior before and after treatment ($p=0.000<0.05$). The results of the independent *T*-test showed a significant influence between the behavior before and after the treatment, with a *p*-value of 0.000 that was smaller than 0.05.

f. Analysis of the Effect of Leaflet Media on Obesity Risk Prevention Behavior in SMP N 1 Talawaan

Variable	t	df	Sig. (2-tailed)	95% CI of the Difference
Behavior (Pre-Post)	14.649	29	0.000	6.553 – 11.780

showed that the results of the independent *T*-test found a significant influence between behavior before and after treatment ($p=0.000<0.05$)

DISCUSSION

a. Characteristics of Respondents by Gender

The identification of respondent characteristics based on gender showed that at SMP Negeri 10 Manado, the majority of respondents were male (53.3%), while at SMP Negeri 1 Talawaan, the majority of respondents were female (56.7%). These differences illustrate demographic dynamics that can influence behavior and response to health promotion interventions. Women tend to be more concerned about their health and physical appearance, so they are more responsive to the issue of obesity and diabetes. This is in line with Ikasari (2020) research which states that female respondents understand the importance of healthy behavior better than men. Thus, gender factors play an important role in shaping obesity prevention behaviors, and health promotion strategies need to consider these differences to be more effective⁷.

b. Identification before and after influence of video media on obesity prevention behaviors risk of diabetes mellitus

The results showed an average pre-test score of 20.4 and increased to 20.9 in the post-test. The increase is not too large, these results prove that video media is effective in improving obesity prevention behaviors in students. Video media is able to present information in an attractive way through a combination of visual and audio, thus facilitating the understanding of complex concepts and encouraging interaction and discussion between students. This discussion strengthens understanding and commitment to implementing healthy behaviors. These findings are in line with the research of Syafira & Yulianti (2021) which shows that video media is effective in improving students' knowledge and attitudes in health education⁸.

c. Identification of behavior before and after treatment using video media in students of SMP Negeri 10 Manado

The average value of participants' behavior before being given treatment was 70, and increased to 86 after being given treatment, with an increase of 16 points. This improvement showed a significant change in the participants' behaviour, reflecting the positive impact of the interventions applied. These results indicate that the treatment successfully improves the subjects' behavior, which may be due to the improvement in knowledge, attitudes, and practices gained during the intervention process. Further analysis is needed to identify the specific elements of the treatment that contribute to the improvement.

In line with these findings, previous research has shown that individuals who are exposed to educational videos have higher levels of understanding and are more willing to change behaviors compared to those who do not watch the videos (Patel & Kumar, 2022)⁹. In addition, Nguyen (2024) reported that participants who participated in an educational video program showed new behaviors after the intervention¹⁰. Hassan S (2025) added that exposure to health campaign videos encourages participation in routine check-ups and preventive activities, which contributes to improving overall public health¹¹.

d. Identification of Respondents Based on Leaflet Media Before and After SMP Negeri 1 Talawaan

The results showed that the average value of respondents' behavior before being given treatment with leaflet media was 18.5, and increased to 19.3 after treatment. These findings indicate that the use of leaflet media is effective in increasing good behavior in students. Leaflet media as a health communication tool has been proven to be able to convey information in a concise, clear, and easy-to-understand manner. Leaflets that combine visual and textual elements not only attract attention, but also reinforce understanding thus encouraging individuals to adopt positive behaviors. This is in line with the opinion of Kreps and Thornton (2020) that effective communication can increase public understanding of health issues and encourage behavior change¹².

In addition, according to Bandura (2021), information media can function as a model of behavior that can be followed, thereby encouraging behavioral changes in individuals¹¹. Smith et al. (2022) also emphasized that the use of leaflets in health education can increase knowledge and positive attitudes towards healthy behaviors¹³. Johnson and Lee's (2023) research supports these findings by stating that the combination of visual and textual elements in leaflets increases the attractiveness and understanding of information, ultimately motivating individuals to apply it in daily life¹⁴

e. Identification of Respondents Based on Behavior Before and After SMP Negeri 1 Talawaan

The results showed that the average value of respondents' behavior before being given treatment using leaflets was 70.2, and increased to 87.2 after treatment. There was an increase of 17 points, indicating that leaflets were effective in increasing individual knowledge, awareness, and motivation to adopt positive behaviors. This increase is in line with research by Smith et al. (2022) which states that leaflet media is able to increase knowledge and positive attitudes towards healthy behaviors¹⁵. Kreps and Thornton (2020) also emphasized that good health communication can strengthen people's understanding and encourage positive behavior change. A well-designed leaflet presents clear, structured, and easy-to-understand information, so as to motivate individuals to make the expected behavioral changes¹⁶

f. Analysis of the influence of video media on prevention behavior: Obesity risk of diabetes mellitus

The results of the study on students of SMP Negeri 10 Manado showed that the use of video media had a significant effect on obesity prevention behavior, the risk of diabetes mellitus with the results of a statistical test $p\text{-value} = 0.000$. The average score of students' behavior increased from 20 to 22, which indicates that video media is effective in improving healthy behaviors. Video media as an audiovisual media is able to attract attention, strengthen understanding, and trigger behavior change because it involves elements of sound and images (Arsyad, 2019)¹⁷. These results are in line with the research of Mahakam (2019) which showed significant differences in obesity prevention knowledge, attitudes, and behaviors before and after the intervention using video. In addition, video content that contains information about obesity, its risks, causes, how to calculate the level of obesity, and healthy diets, can strengthen students' understanding through a combination of visual and audio¹⁸. This research supports the opinion of Firdaus (2020) that audiovisual media can improve learning outcomes because it involves the senses of hearing and sight at the same time, thereby encouraging students' motivation to learn and interest in adopting healthy behaviors. Thus, the selection of video media as a means of health promotion has proven to be appropriate and effective in improving obesity prevention behavior in adolescents¹⁹.

g. Analysis of the Influence of Leaflet Media on Obesity Prevention Behavior, Risk of Diabetes Mellitus

The results of the study at SMP Negeri 1 Talawaan showed that the use of leaflet media had a significant effect on improving students' knowledge, attitudes, and behaviors with the results of a statistical test of $p\text{-value} = 0.000$. This confirms that leaflets can be an effective and efficient alternative to health education media, especially in areas with limited resources, although video media has proven to have a stronger influence. Leaflets are simple printed media containing text and images that can be read repeatedly, making it easier for students to understand and remember health messages (Wibawa, 2019; Notoatmodjo, 2012)²⁰. Hasana's research (2019) also found significant differences in students' knowledge, attitudes, and behaviors after education using leaflets. In line with that,²¹ Sutan (2019) emphasized that leaflets are effective as a means of conveying health messages because they are practical, easily accessible, and able to foster student learning motivation²² Kurniasari's research (2021) shows that leaflets are effective in increasing students' knowledge and attitudes in nutrition education programs, in line with the leaflet's function as a simple and easy-to-understand learning medium²³. The results of the study show that leaflets are able to significantly increase adolescents' knowledge and attitudes regarding the dangers of obesity, due to their rereadable and practical nature (2020)²⁴. Rachmawati, W. C. (2019) explained that print media such as leaflets is a form of effective health communication media because it can reach targets with limited technological facilities²⁵.

CONCLUSION

This study shows that both video media and leaflets are equally effective in improving students' knowledge, attitudes, and behaviors related to obesity prevention of diabetes mellitus risk. At SMP Negeri 10 Manado, the use of video media was proven to have a stronger influence with significant statistical test results ($p\text{-value} = 0.000$) and an increase in behavioral scores from 20 to 22. Video media as an audiovisual medium is able to attract attention, strengthen understanding, and motivate students to adopt healthy behaviors.

Meanwhile, at SMP Negeri 1 Talawaan, the use of leaflet media also had a significant effect ($p\text{-value} = 0.000$) with an increase in the average behavior score from 70.2 to 87.2. Leaflets, while simple, have proven to be effective because they can be read repeatedly, present concise and concise information, and are easily accessible even in resource-constrained areas.

Overall, both media have proven to be effective health education strategies in schools. Video media is superior in attracting interest and shaping behavior, while leaflets are a practical and efficient alternative in reaching students. The two can complement each other in health promotion efforts to prevent obesity and diabetes mellitus risk in adolescents.

ACKNOWLEDGMENTS

Praise be to the author for praying to the presence of God Almighty, because by His grace and grace this thesis can be completed well. The author would like to express his deepest gratitude to the two supervisors for the guidance, direction, and motivation provided. Gratitude was also conveyed to the examiner lecturers, the schools of SMP Negeri 10 Manado and SMP Negeri 1 Talawaan, as well as all respondents who have participated in this study. The author does not forget to express his gratitude to his family, friends, and all parties who have provided prayers and support until the preparation of this thesis.

REFERENCES

1. World Health Organization (WHO). (2022). *Obesity and overweight*. Geneva: WHO.
2. Ministry of Health of the Republic of Indonesia. (2023). *Indonesian health survey 2023*. Jakarta: Ministry of Health of the Republic of Indonesia.
3. Intan, N., et al. (2022). Media Usage of Facebook in the Health Promotion Programme of UIN Suska Riau. *Alittizaan*, 6(2), 137–144.
4. Amelia, T. & Kurniasari, R. (2021). 'The effect of the use of animated video media and scrapbooks on increasing obesity knowledge in adolescents', *GIZIDO Journal*, 13(2), pp. 75–84.
5. Nubatonis. (2019). *The Scope of Health Promotion Media*. Yogyakarta: Media.
6. Isasari, R. (2020). 'Differences in healthy living behaviors by gender in adolescents', *Journal of Public Health*, 15(2), pp. 45–53.
7. Syafira, D. D. & Yulianti, F. (2021). 'The effect of obesity prevention video education on adolescent girls' knowledge and attitudes', *Siliwangi Health Journal*, 2(1), pp. 65–70.
8. Patel, R. & Kumar, S. (2022). 'Impact of health education videos on adolescent behaviour change', *International Journal of Public Health*, 67(4), pp. 320–329.
9. Nguyen, T. (2024). 'Video-based education and preventive health behaviour in adolescents', *Asian Journal of Health Promotion*, 12(1), pp. 55–64.
10. Jirjees, F., Hasan, S., Krass, I., et al. (2024). 'Time for health change: promoting community-based diabetes screening and prevention with video vignettes and social marketing', *BMC Public Health*, 24, pp. 2340.
11. Kreps, G.L. & Thornton, B.C. (2020). *Health Communication: Theory, Method, and Application*. Routledge.
12. Bandura, A. (2021). 'Social cognitive theory of mass communication', *Media Psychology*, 24(1), pp. 12–27.
13. Smith, J., Brown, T. & Williams, K. (2022). 'Effectiveness of leaflet-based education on adolescent health behaviours', *Journal of Health Promotion*, 36(2), pp. 88–97.
14. Johnson, H. & Lee, C. (2023). 'Visual and textual integration in health leaflets: Impact on comprehension and behaviour', *Health Education Research*, 38(1), pp. 15–24.
15. Smith, J., Brown, T. & Williams, K. (2022). 'Effectiveness of leaflet-based education on adolescent health behaviours', *Journal of Health Promotion*, 36(2), pp. 88–97.
16. Kreps, G.L. & Thornton, B.C. (2020). *Health Communication: Theory, Method, and Application*. Routledge.
17. Arsyad, A. (2019). *Learning media*. Jakarta: Rajawali Press.
18. Mahakam, S. (2019). 'The effect of video media on obesity prevention in adolescents', *Journal of Health Education*, 10(2), pp. 55–62.
19. Firdaus, F. (2020). 'The effectiveness of audiovisual media in improving health learning outcomes', *Journal of Health Promotion*, 8(1), pp. 33–41.
20. Wibawa, S. (2019). *Leaflets as a health communication medium*. Yogyakarta: Pustaka Belajar.
21. Hasan, R. (2019). 'The effectiveness of leaflets in improving students' healthy behavior', *Indonesian Health Promotion Journal*, 14(1), pp. 23–30.
22. Sutan, D. (2019). 'Print media in health education: a study of leaflet effectiveness', *Journal of Health Education*, 17(2), pp. 102–109.
23. Kurniasari R, Amelia T. The effect of leaflet use on improving students' knowledge and attitudes about balanced nutrition. *J Promkes Indonesian*. 2021; 16(2):107–116.
24. Utami DA, Sari DP. The effectiveness of leaflet media in increasing adolescents' knowledge and attitudes about the dangers of obesity. *J Community Nursing*. 2020; 8(1):23–30.
25. Rachmawati WC. *Health promotion and behavioral science*. Malang: Wineka Media; 2019.