

The Effect of Video Media and Leaflet Media on Obesity Prevention Behavior, Risk of Diabetes Mellitus in Students at SMP Negeri 10 Manado and SMP Negeri 1 Talawaan

Aunsi Fretania¹, Kolompoy A Jane², Memah P Herlina³
Poltekkes Kemenkes Manado

*Corresponding Author: fretaniaaunsi22a@gmail.com

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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, leaflet media

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 global health problem that continues to increase and has become a major risk factor for non-communicable diseases, particularly type 2 Diabetes Mellitus (DM). According to the World Health Organization (WHO, 2022), more than 1 billion people worldwide are living with obesity, with the prevalence among children and adolescents having increased fourfold since 1990. In Indonesia, the Indonesian Health Survey (Survei Kesehatan Indonesia/SKI, 2023) reported that 37.4% of the population aged ≥ 10 years engaged in insufficient physical activity, with the highest prevalence observed among adolescents aged 10–14 years (58%). North Sulawesi ranked second nationally in obesity prevalence, with obesity affecting 26% of males and 64.5% of females.

According to the Indonesian Health Survey (SKI, 2023), North Sulawesi recorded the second-highest obesity prevalence in Indonesia, with obesity affecting 26% of males and 64.5% of females.

Intan K. et al. (2022) stated that health promotion media serve as a means of delivering information or health messages from communicators to target audiences with the aim of increasing knowledge and encouraging positive health behavior change. Health promotion media may include visual, audio, and audiovisual formats.

Amelia T. and Kurniasari (2021) argued that video is an effective medium for health promotion activities because it has been shown to improve adolescents' knowledge and attitudes. Video-based education engages multiple senses simultaneously, making it easier for individuals to understand and retain the information presented.

According to Nubatonis (2019), a leaflet is a health education medium that conveys health messages and information through concise written text accompanied by illustrations on a printed sheet.

SMP Negeri 10 Manado and SMP Negeri 1 Talawaan have reported cases of obesity among their students; however, obesity prevention programs in these schools have not yet been optimally implemented. This situation provided the rationale for conducting this study to examine the effects of video and leaflet-based educational media on obesity prevention behaviors among students at risk of developing type 2 Diabetes Mellitus.

METHODS

Study Design, Setting, and Duration

This study employed a quasi-experimental design using a two-group pretest–posttest design. This design was selected because it enables researchers to measure changes in behavior before and after the intervention in two different groups, allowing for a comparison of the effectiveness of video and leaflet educational media.

The study was conducted at SMP Negeri 10 Manado and SMP Negeri 1 Talawaan. These schools were selected based on the relatively high number of students with obesity (SMP Negeri 10 Manado: 59 obese students out of 1,009 students; SMP Negeri 1 Talawaan: 15 obese students out of 80 students) and the lack of optimal obesity prevention programs within the schools. These conditions made both schools appropriate settings for implementing health education interventions.

The study was carried out between May and June 2025, coinciding with the active school semester. This period facilitated access to students for the sequential implementation of the pretest, educational intervention, and posttest.

Participants and Sampling

The study included 60 students, who were divided into two groups: 30 students from SMP Negeri 10 Manado assigned to the video intervention group, and 30 students from SMP Negeri 1 Talawaan assigned to the leaflet intervention group. Participants were selected using a random sampling technique to ensure

that each student had an equal chance of being included, thereby minimizing selection bias and improving the validity of the study findings.

A sample size of 30 participants per group was considered adequate for statistical analysis and is generally acceptable for quasi-experimental studies utilizing t-test analyses. Junior high school students were selected because adolescents are particularly vulnerable to obesity and the subsequent risk of developing type 2 diabetes mellitus due to unhealthy dietary habits and insufficient physical activity. Early educational interventions are expected to promote healthier preventive behaviors.

Data Collection

Prior to data collection, participants and their parents or legal guardians were informed about the study objectives and procedures, and written informed consent was obtained. Participants then completed a pretest questionnaire to assess baseline obesity prevention behaviors. Following the pretest, each group received the assigned educational intervention (video or leaflet). After the intervention, participants completed a posttest questionnaire, with the researcher providing guidance throughout the process to ensure that all questions were clearly understood and fully completed.

Data Processing and Analysis

The collected questionnaire data were first checked for completeness through an editing process to identify missing or inconsistent responses. Subsequently, coding was performed by assigning numerical codes to each response. The data were then entered into SPSS software, followed by data cleaning to ensure the accuracy of data entry and eliminate potential errors.

Data analysis was conducted in two stages:

1. Univariate analysis was performed to describe participants' demographic characteristics and obesity prevention behavior before and after the intervention.
2. Bivariate analysis was conducted using a paired-samples t-test to examine differences between pretest and posttest scores within each intervention group, while an independent-samples t-test was used to compare the effectiveness of the video and leaflet interventions. Statistical significance was established at $\alpha = 0.05$.

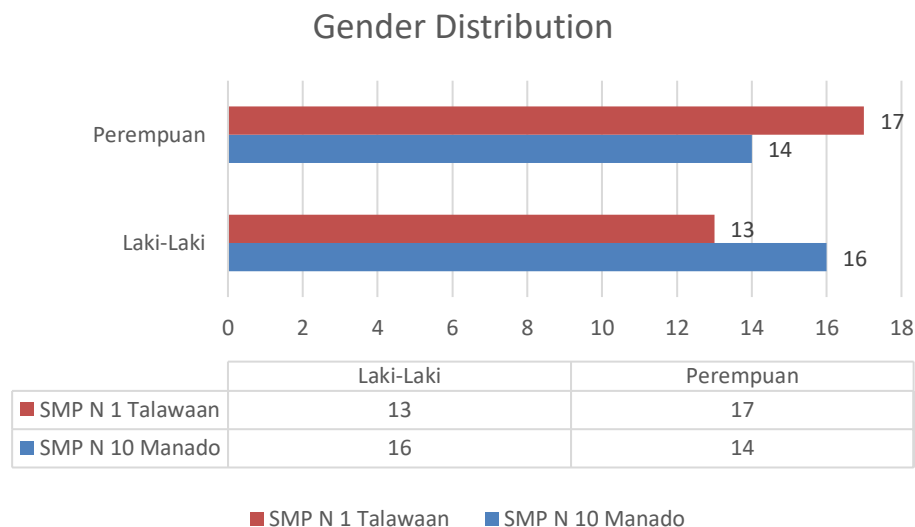
RESULTS AND DISCUSSION

A. RESULTS

This study involved 60 respondents, consisting of 30 students from SMP Negeri 10 Manado and 30 students from SMP Negeri 1 Talawaan. Based on gender distribution, the majority of respondents in both schools were male, although female students were also represented. The respondents were in the early adolescent age group, consistent with the junior high school level. The distribution of preventive behavior demonstrated differences in scores before and after the intervention in both the group that received video-based education and the group that received leaflet-based education.

1. Univariate Analysis

Frequency Distribution of Respondents by Gender

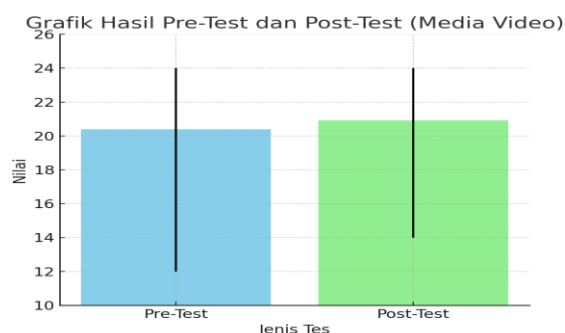


Based on the diagram above, it shows that the majority of respondents at SMP Negeri 10 Manado were male, totaling 16 respondents (53.3%), while the majority of respondents at SMP Negeri 1 Talawaan were female, totaling 17 respondents (56.7%).

2. Bivariate Analysis

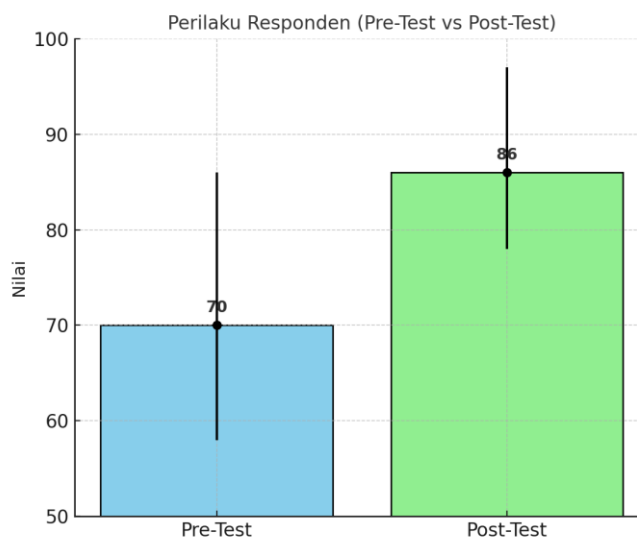
Bivariate analysis was conducted to determine the differences in the mean pre-test and post-test scores in each intervention group (video and leaflet). The statistical test used was the paired t-test because the data were paired (before and after the intervention within the same group).

Distribution of Mean Scores Before and After Intervention Using Video Media at SMP Negeri 10 Manado



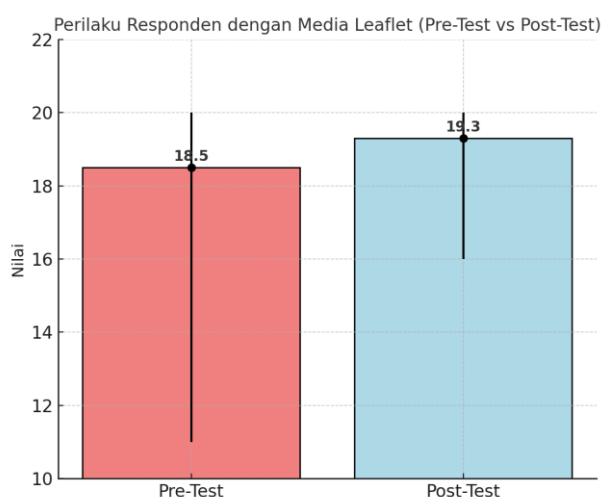
Based on the diagram, it shows that the mean score for the video media group before the treatment was 20.4. After the treatment was given, the mean score increased to 20.9.

Distribution of Mean Respondents' Behavior Before and After Intervention Using Video Media at SMP Negeri 10 Manado



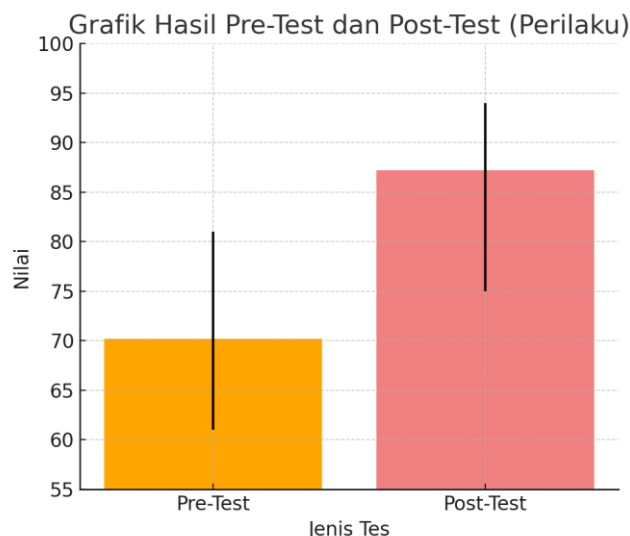
Based on the diagram, it shows that the mean score of behavior before the treatment was **70**. After the treatment was given, the mean score increased to **86**.

Distribution of Mean Scores Before and After Intervention Using Leaflet Media at SMP Negeri 1 Talawaan



Based on the diagram, it shows that the mean score for the leaflet media group before the treatment was **18.5**. After the treatment was given, the mean score increased to **19.3**.

Distribution of Mean Respondents' Behavior Before and After Intervention Using Leaflet Media at SMP Negeri 1 Talawaan



Based on the diagram, it shows that the mean score of behavior before the treatment was **70.2**. After the treatment was given, the mean score increased to **87.2**.

a. Analysis Before and After the Video Media Treatment

The results showed that the independent t-test indicated a significant effect between behavior before and after the treatment ($p = 0.000 < 0.05$). The independent t-test results demonstrated that the use of video media had an effect on behavior before and after the intervention, with a p-value of 0.000, which is smaller than 0.05.

b. Analysis of the Effect of Leaflet Media on Obesity Prevention Behavior Related to Diabetes Mellitus (DM) Risk at SMP Negeri 1 Talawaan

For the variable of Obesity Prevention Behavior Related to Diabetes Mellitus (DM) Risk (measured before and after the treatment) at SMP Negeri 1 Talawaan, the statistical t-value obtained was **14.649** with **29 degrees of freedom (df)**. The two-tailed significance value (**Sig. 2-tailed**) showed that the difference interval ranged from **6.553 to 11.780**. The independent t-test results showed a significant effect between leaflet media and obesity prevention behavior related to diabetes mellitus risk ($p = 0.000 < 0.05$).

DISCUSSION

Characteristics of Respondents Based on Gender

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%). This difference reflects demographic dynamics that may influence behavior and responses toward health promotion interventions. Females tend to have greater concern regarding health and physical appearance, making them more responsive to obesity and diabetes-related issues. This finding is consistent with Ikasari (2020), who stated that female respondents have a better understanding of the importance of adopting healthy behaviors compared to males. Therefore, gender is an

important factor in shaping obesity prevention behaviors, and health promotion strategies should consider these differences to improve their effectiveness.

Identification of the Effect of Video Media Before and After Intervention on Obesity Prevention Behavior Related to Diabetes Mellitus Risk

The results showed that the mean pre-test score was 20.4 and increased to 20.9 in the post-test. Although the increase was relatively small, these findings indicate that video media was effective in improving obesity prevention behaviors among students. Video media is able to present information attractively through a combination of visual and audio elements, making it easier to understand complex concepts while encouraging interaction and discussion among students. Such discussions strengthen understanding and commitment to implementing healthy behaviors. These findings are consistent with Syafira and Yulianti (2021), who demonstrated that video media is effective in improving students' knowledge and attitudes in health education programs.

Identification of Behavior Before and After Treatment Using Video Media Among Students at SMP Negeri 10 Manado

The mean behavioral score of participants before receiving the intervention was 70, increasing to 86 after the intervention, with an improvement of 16 points. This increase indicates a significant behavioral change among participants, reflecting the positive impact of the implemented intervention. The findings suggest that the treatment successfully improved participants' behaviors, which may have been influenced by increased knowledge, attitudes, and practices obtained during the intervention process. Further analysis is required to identify the specific elements of the treatment that contributed to this improvement.

Consistent with these findings, previous research by Patel and Kumar (2022) showed that individuals exposed to educational videos had higher levels of understanding and were more willing to change their behaviors compared to those who did not receive video-based education. Furthermore, Nguyen (2024) reported that participants involved in video-based educational programs demonstrated new behavioral changes after the intervention. Jirjees and Hassan S (2025) further emphasized that exposure to health campaign videos encouraged participation in routine health examinations and preventive activities, contributing to overall improvements in public health.

Identification of Respondents Based on Leaflet Media Before and After Intervention at SMP Negeri 1 Talawaan

The results showed that the mean behavioral score of respondents before receiving treatment using leaflet media was 18.5 and increased to 19.3 after the intervention. These findings indicate that the use of leaflet media was effective in improving students' behaviors.

Leaflets as a health communication tool have been proven to effectively deliver information in a concise, clear, and easily understandable manner. Leaflets that combine visual elements and text not only attract attention but also strengthen comprehension, thereby encouraging individuals to adopt positive behaviors. This finding is consistent with Kreps and Thornton (2020), who stated that effective communication can improve public understanding of health issues and encourage behavioral changes.

According to Bandura (2021), information media can function as behavioral models that can be observed and followed by individuals, thereby promoting behavioral change. Smith et al. (2022) also confirmed that the use of leaflets in health education can improve knowledge and positive attitudes toward healthy behaviors. Johnson and Lee (2023) supported these findings by stating that the combination of visual and textual elements in leaflets increases information attractiveness and understanding, ultimately motivating individuals to apply healthy behaviors in daily life.

Identification of Respondents' Behavior Before and After Intervention at SMP Negeri 1 Talawaan

The results showed that the mean behavioral score of respondents before receiving treatment using leaflet media was 70.2 and increased to 87.2 after the intervention. An increase of 17 points was observed, indicating that leaflets were effective in improving individuals' knowledge, awareness, and motivation to adopt positive behaviors.

This improvement is consistent with Smith et al. (2022), who stated that leaflet media can improve knowledge and positive attitudes toward healthy behaviors. Kreps and Thornton (2020) also emphasized that effective health communication can strengthen public understanding and encourage positive behavioral changes. Well-designed leaflets that provide clear, structured, and easy-to-understand information are able to motivate individuals to implement the expected behavioral changes.

Analysis of the Effect of Video Media on Obesity Prevention Behavior Related to Diabetes Mellitus Risk

The results of the study among students at SMP Negeri 10 Manado showed that the use of video media had a significant effect on obesity prevention behaviors related to diabetes mellitus risk, with a statistical test result of $p\text{-value} = 0.000$. The mean behavioral score increased from 20.4 to 20.9, indicating that video media was effective in improving health-related behaviors.

According to Arsyad (2019), video media as an audiovisual medium can attract attention, strengthen understanding, and stimulate behavioral changes because it involves both sound and visual elements. These results are consistent with Mahakam (2019), who found significant differences in knowledge, attitudes, and obesity prevention behaviors before and after interventions using video media. In addition, video content containing information about obesity, its risks, causes, methods for calculating obesity levels, and healthy eating patterns can strengthen students' understanding through the integration of visual and audio information.

This study supports Firdaus (2020), who stated that audiovisual media can improve learning outcomes because it simultaneously engages hearing and vision, thereby increasing learning motivation and students' interest in adopting healthy behaviors. The selection of video media as a health promotion tool was appropriate and effective in improving obesity prevention behaviors among adolescents.

Analysis of the Effect of Leaflet Media on Obesity Prevention Behavior Related to Diabetes Mellitus Risk

The results at SMP Negeri 1 Talawaan showed that the use of leaflet media had a significant effect on improving students' knowledge, attitudes, and behaviors, with a statistical test result of $p\text{-value} = 0.000$. This finding confirms that leaflets can serve as an effective and efficient alternative health education medium, particularly in areas with limited resources, although video media demonstrated a stronger effect.

According to Wibawa (2019) and Notoatmodjo (2012), leaflets are simple printed media containing text and images that can be read repeatedly, facilitating students' understanding and retention of health messages. Hasana (2019) also found significant differences in students' knowledge, attitudes, and behaviors after education using leaflet media. Similarly, Sutan (2019) emphasized that leaflets are effective in delivering health messages because they are practical, easily accessible, and capable of increasing students' learning motivation.

Kurniasari (2021) demonstrated that leaflets effectively improve students' knowledge and attitudes in nutrition education programs, consistent with the role of leaflets as simple and easy-to-understand learning media. Utami (2020) reported that leaflets significantly improved adolescents' knowledge and attitudes regarding obesity risks due to their practical nature and ability to be reviewed repeatedly. Rachmawati (2019) explained that printed media such as leaflets represent an effective form of health communication because they can reach target populations with limited access to technological facilities.

CONCLUSION

The results of this study showed that the mean behavioral score before receiving treatment using video media at SMP Negeri 10 Manado was 70. After the intervention, the mean score increased to 86. These results indicate that there was an increase in the mean behavioral score of 16 points between before and after the intervention.

The results also showed that the mean behavioral score before receiving treatment using leaflet media at SMP Negeri 1 Talawaan was 70.2. After the intervention, the mean score increased to 87.2. These findings demonstrate an improvement of 17 points in behavioral scores before and after the intervention.

It can be concluded that video media had an effect on obesity prevention behavior related to diabetes mellitus risk among students at SMP Negeri 10 Manado (p-value = 0.000).

It can also be concluded that leaflet media had an effect on obesity prevention behavior related to diabetes mellitus risk among students at SMP Negeri 1 Talawaan (p-value = 0.000).

Overall, both media were proven to be effective health education strategies in school settings. Video media was more superior in attracting students' interest and promoting behavioral changes, while leaflet media served as a practical and efficient alternative for reaching students. Both media can complement each other in health promotion efforts aimed at preventing obesity and reducing the risk of diabetes mellitus among adolescents.

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