

The Effect of Disc-Based Nutrition Education on Knowledge and Attitudes Toward Obesity Among Adolescents at Junior High School 3 Banda Aceh

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Abstract

Adolescent obesity is a major public health concern because it often persists into adulthood and increases the risk of chronic non-communicable diseases. Therefore, effective school-based nutrition education is essential to improve adolescents' knowledge and attitudes toward obesity prevention. To evaluate the effect of nutrition counseling using disc media on improving knowledge and attitudes toward obesity among students at Junior High School 3 Banda Aceh. This quantitative study employed a quasi-experimental design with a pretest–posttest control group approach. A total of 64 students were selected using purposive sampling and equally assigned to an intervention group (n = 32) and a control group (n = 32). The intervention group received nutrition counseling using disc media, whereas the control group received conventional lecture-based counseling without instructional media. Data were analyzed using paired and independent *t*-tests with a significance level of 95% ($\alpha = 0.05$) using SPSS version 25. The intervention group demonstrated a significantly greater improvement in knowledge and attitudes than the control group. Knowledge scores increased by 4.75 points (38.96%) and attitude scores by 5.59 points (9.99%) in the intervention group (both $p < 0.001$). In contrast, the control group showed smaller improvements in knowledge (1.53 points; 12.95%; $p < 0.001$) and attitudes (2.50 points; 4.79%; $p = 0.001$). Nutrition counseling using disc media was more effective than conventional counseling in improving adolescents' knowledge and attitudes toward obesity prevention. These findings support the use of visually interactive educational media as an effective strategy for school-based obesity prevention programs.

Keywords: adolescents, disc media, health education, nutrition counselling, obesity

Introduction

Obesity has become one of the most important public health challenges worldwide, affecting children, adolescents, and adults. Excess body weight during adolescence is associated with an increased risk of obesity in adulthood and contributes to the early development of non-communicable diseases, including type 2 diabetes, hypertension, cardiovascular disease, and metabolic disorders. Beyond its physical health consequences, adolescent obesity is also associated with poor self-esteem, body image dissatisfaction, and psychosocial problems, which may adversely affect quality of life and academic performance.

In Indonesia, the prevalence of adolescent overweight and obesity continues to increase. Data from the 2023 Indonesian Health Survey (SKI) showed that approximately 12.1% of adolescents aged 13–15 years were overweight and 4.1% were obese. In Aceh Province, the prevalence of overweight and obesity among adolescents reached 12.4% and 2.9%, respectively, while Banda Aceh reported even higher proportions than the provincial average. Recent evidence also indicates that unhealthy dietary patterns, frequent consumption of energy-dense foods and sugar-sweetened beverages, and insufficient physical activity are important determinants of adolescent obesity in Indonesia.

Because obesity is largely preventable, school-based interventions represent an important strategy for promoting healthy lifestyles among adolescents. Nutrition education can improve knowledge, shape positive attitudes, and encourage healthier dietary behaviors by increasing adolescents' understanding of balanced nutrition, appropriate food choices, and obesity prevention. Improving nutrition literacy during adolescence is essential because this developmental period is characterized by increasing independence in food selection and lifestyle behaviors.

The effectiveness of nutrition education is strongly influenced by the educational media employed. Interactive learning media facilitate students' engagement, improve attention, and enhance information retention compared with conventional lecture-based approaches. One educational tool developed in Indonesia is the nutrition disc, a rotating visual aid that presents nutrition information in a simple and attractive format, enabling students to understand nutritional concepts more easily while encouraging active participation during educational sessions.

Although various educational media have been used in school-based nutrition programs, evidence regarding the effectiveness of disc-based counseling in improving adolescents' knowledge and attitudes toward obesity remains limited, particularly among junior high school students in Indonesia. Therefore, this study aimed to evaluate the effect of counseling using disc media on improving knowledge and attitudes toward obesity among adolescents at Junior High School 3 Banda Aceh.

Methods

This study employed a quantitative approach using a quasi-experimental pretest–posttest control group design. The study was conducted on December 2024, at Junior High School 3 Banda Aceh, Indonesia. Participants were selected using a purposive sampling technique based on predetermined inclusion criteria. A total of 64 adolescents participated in the study and were equally allocated into two groups: an intervention group ($n = 32$) and a control group ($n = 32$). The intervention group received nutrition counseling on obesity using disc-based educational media, whereas the control group received conventional oral counseling without educational media. The independent variable was nutrition counseling using disc media, while the dependent variables were adolescents' knowledge and attitudes toward obesity. Knowledge and attitude data were collected using structured questionnaires administered before (pretest) and after (posttest) the educational intervention. The questionnaire was developed based on obesity and nutrition education materials and was administered under the supervision of the research team. Data were analyzed using IBM SPSS Statistics. Descriptive statistics were used to summarize participant

characteristics and study variables. Within-group differences between pretest and posttest scores were analyzed using the paired *t*-test, whereas differences between the intervention and control groups were assessed using the independent *t*-test. Statistical significance was established at $p < 0.05$. This study was approved by the Health Research Ethics Committee of Poltekkes Kemenkes Aceh (Approval No. DP.04.03/12.7/290/2024). Written informed consent was obtained from all participants and their parents or legal guardians prior to data collection.

Result

A total of 64 students participated in the study, with 32 students assigned to the intervention group and 32 to the control group. Counseling using disc media is effective in increasing students' knowledge. The average knowledge of the treatment group increased from 12.19 to 16.94 ($p=0.000$), higher than the control group which increased from 11.81 to 13.34 ($p=0.000$). This shows that the disc media has a greater effect on increasing knowledge.

Knowledge

Table 1. Students' knowledge level before and after counseling with media and without media

Student knowledge before and after counseling	n	Min	Max	Value Mean	SD	Value p
Treatment Group Knowledge						
Pre Test	32	6	17	12,19	2,967	0,001
Post Test	32	13	20	16,94	1,722	
Control Group Knowledge						
Pre Test	32	5	16	11,81	2,705	0,001
Post Test	32	6	18	13,34	2,431	

Table 1 presents the changes in students' knowledge scores before and after the educational intervention. In the intervention group, the mean knowledge score increased significantly from 12.19 ± 2.97 at pretest to 16.94 ± 1.72 at posttest ($p < 0.001$). In the control group, the mean score also increased significantly from 11.81 ± 2.71 to 13.34 ± 2.43 ($p < 0.001$), although the magnitude of improvement was smaller than that observed in the intervention group.

Table 2. The Effect of Counseling Using Media and Without Media on Student Knowledge

Variables	Average	SD	ΔAverage± SD	CI 95%	Value p
Knowledge					
Treatment (pre)	12,19	2,967	$4,750 \pm 2,272$	3,93-5,56	0,001
Treatment (post)	16,94	1,722			
Kontrol (pre)	11,81	2,705	$1,531 \pm 1,295$	1,06-1,99	0,001
Kontrol (post)	13,34	2,431			

The mean change in knowledge score was 4.75 ± 2.27 (95% CI: 3.93–5.56) in the intervention group compared with 1.53 ± 1.29 (95% CI: 1.06–1.99) in the control group (Table 2).

Attitudes

Changes in students' attitudes toward obesity are presented in Table 3. The intervention group demonstrated a significant increase in mean attitude score from 55.91 ± 7.11 at pretest to 61.50 ± 7.13 at posttest ($p < 0.001$). Likewise, the control group showed a significant improvement from 52.13 ± 5.90 to 54.63 ± 5.98 ($p = 0.001$), although the increase was less pronounced. As shown in Table 4, the mean change in attitude score was 5.59 ± 3.95 (95% CI: 4.17–7.01) in the intervention group, whereas the control group showed a mean increase of 2.50 ± 3.95 (95% CI: 1.07–3.92). Overall, students who received counseling using disc media demonstrated greater improvements in both knowledge and attitudes toward obesity than those who received conventional counseling without educational media.

Table 3. Students' attitude level before and after counseling with media and without media

Students' attitudes before and after counseling	n	Min	Max	Value Mean	SD	Value p
Treatment Group Attitude						
Pre Test	32	42	69	55,91	7,105	0,001
Post Test	32	44	74	61,50	7,126	
Control Group Attitude						
Pre Test	32	43	67	52,13	5,901	0,001
Post Test	32	44	69	54,63	5,977	

The attitude of students in the treatment group increased from an average value of 55.91 to 61.50 ($p = 0.000$), indicating the effect of counseling using disc media. The control group also experienced an increase from 52.13 to 54.63 ($p = 0.001$), but the increase was smaller. This shows that the disk media is more effective in improving students' attitudes towards obesity.

Table 2. The Effect of Counseling Using Media and Without Media on Student Attitudes

Variables	Average	SD	Δ AVERAGE $\pm$ SD	CI 95%	Value p
Attitude					
Treatment (pre)	55,91	7,105	$5,594 \pm 3,950$	4,17-7,01	0,001
Treatment (post)	61,50	7,126			
Control (pre)	52,13	5,901	$2,500 \pm 3,951$	1,07-3,92	0,001
Control (post)	54,63	5,977			

As shown in Table 4, the mean change in attitude score was 5.59 ± 3.95 (95% CI: 4.17–7.01) in the intervention group, whereas the control group showed a mean increase of 2.50 ± 3.95 (95% CI: 1.07–3.92). Overall, students who received counseling using disc media demonstrated greater improvements in both knowledge and attitudes toward obesity than those who received conventional counseling without educational media.

Discussion

The findings demonstrated a statistically significant improvement in knowledge scores in both groups following the intervention ($p < 0.001$). However, the magnitude of improvement was substantially greater in the intervention group. The mean knowledge score increased from

12.19 to 16.94 in the intervention group (mean difference = 4.75), whereas the control group showed only a modest increase from 11.81 to 13.34 (mean difference = 1.53). Likewise, students' attitudes toward obesity prevention improved significantly in both groups, although the increase was more pronounced in the intervention group. The mean attitude score increased from 55.91 to 61.50 (mean difference = 5.59 ± 3.95 ; 95% CI: 4.17–7.01; $p < 0.001$), while the control group increased from 52.13 to 54.63 (mean difference = 2.50 ± 3.95 ; 95% CI: 1.07–3.92; $p = 0.001$). These findings indicate that nutrition counseling supported by disc media is more effective than conventional counseling in improving both knowledge and attitudes related to obesity prevention, which is consistent with previous school-based nutrition education studies (Samad et al., 2024; Flores-Vázquez et al., 2024).

The superior effectiveness of disc media may be explained by the use of visual learning principles, which facilitate attention, comprehension, and memory retention. According to the Cognitive Theory of Multimedia Learning, learners process information more effectively when verbal explanations are combined with meaningful visual representations, allowing information to be encoded through multiple cognitive pathways. Consequently, educational messages become easier to understand and retain than information delivered through verbal instruction alone (Mayer, 2021). This mechanism may explain the greater improvement in knowledge observed among students who received counseling using disc media.

The present findings are also consistent with recent evidence demonstrating that interactive educational media enhance student engagement and improve nutrition learning outcomes. A systematic review by Samad et al. (2024) concluded that school-based nutrition education incorporating interactive teaching strategies produced greater improvements in nutrition knowledge and healthy eating behaviors than conventional classroom instruction. Similarly, Flores-Vázquez et al. (2024) reported that nutrition education interventions grounded in behavioral theory significantly improved adolescents' nutrition knowledge and supported healthier food choices. These findings reinforce the importance of integrating interactive educational media into school-based health promotion programs.

Besides improving knowledge, disc media also produced greater positive changes in students' attitudes toward obesity prevention. Attitude represents an important determinant of future health behavior because it reflects an individual's willingness to adopt healthier dietary practices and lifestyles. The attractive visual presentation and interactive characteristics of the disc media likely increased students' attention, motivation, and emotional engagement, thereby making health messages more meaningful and memorable. Previous systematic reviews have shown that school-based nutrition education can positively influence not only nutrition knowledge but also attitudes and healthy lifestyle behaviors, particularly when learning activities actively engage students and encourage participation (Samad et al., 2024; Hoare et al., 2022).

Although the present study demonstrated the effectiveness of disc media, several limitations should be acknowledged. The intervention was conducted in a single junior high school with a relatively small sample size and a short follow-up period; therefore, the findings may not be generalizable to other adolescent populations. Furthermore, the study assessed only short-term changes in knowledge and attitudes without evaluating whether these improvements translated into sustained behavioral changes or reductions in obesity risk. Future studies should include larger multicenter samples, longer follow-up periods, and objective behavioral outcomes,

such as dietary intake, physical activity, and anthropometric indicators, to better determine the long-term effectiveness of disc-based nutrition education.

Conclusion

Nutrition counseling using disc media was more effective than conventional lecture-based counseling in improving junior high school students' knowledge and attitudes toward obesity prevention. The intervention group demonstrated a greater increase in knowledge (4.75 points; 38.96%) and attitudes (5.59 points; 9.99%) compared with the control group, which showed improvements of only 1.53 points (12.95%) in knowledge and 2.50 points (4.79%) in attitudes. These differences were statistically significant ($p < 0.05$), indicating the superiority of disc media as an educational tool. The findings suggest that incorporating visually interactive media into school-based nutrition education can enhance students' understanding and foster more positive attitudes toward obesity prevention. Therefore, disc media may serve as an effective and practical educational resource for obesity prevention programs among adolescents. Future studies should evaluate the long-term effects of disc media on behavioral changes, dietary practices, physical activity, and obesity-related health outcomes in larger and more diverse adolescent populations.

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