A study to assess the effectiveness of Video Teaching Program on knowledge regarding prevalence of Obesity among school children in selected school at Salem district

[1]Kavitha R, [2]Sathiya P, [3*]Jamunarani R

[1,2,3]Department of Child Health Nursing, Sre Sakthimayeil Institute of Nursing and Research, Kumarapalayam, Namakkal – 637209, Tamilnadu, India

**Corresponding Author E-mail: nursingprinicipal@jkkn.ac.in*

Abstract

Introduction: *Childhood obesity is one of the emerging public health issues that is associated with a range of serious health problems, including cardiovascular diseases and diabetes. There is a need to fill the knowledge gap of the school children regarding the causes and prevention of obesity. The present study assesses the effectiveness of a video teaching program on enhancing knowledge related to obesity among school children in Salem District.*

Methodology: *Pre-experimental one-group pre-test and post-test design was applied. Sixty students aged 13–15 years were chosen using non-probability convenience sampling. Data were collected by using a structured knowledge questionnaire consisting of 20 multiple-choice questions. The intervention consisted of a video teaching program on obesity's prevalence, causes, and prevention. Descriptive and inferential statistics were applied to analyze the data including paired t-tests and chi-square tests.*

Results: *The mean pre-test knowledge score was 8.08 and increased to 14.80 in the posttest, with a mean difference of 6.72, t=54.65, p=0.001, which means significant improvement. Posttest outcomes reveal that 75 percent students have attained adequate knowledge, compared to 0 percent students in the pretest. Improvement in knowledge was significantly correlated with age, physical activity, and dietary habits, p<.05.*

Conclusion: *The video teaching program effectively enhanced knowledge about obesity among school children. It demonstrates the potential of multimedia interventions in bridging knowledge gaps and promoting preventive health behaviors to combat childhood obesity.*

Keywords: Childhood obesity, video teaching, knowledge improvement, public health, school-based intervention.

INTRODUCTION:

Childhood obesity has appeared as one of the major public health issues, and an alarming increase has been observed over the last two decades.[1,2] It has become the most preventable nutritional disease of the 21st century.[3] As of 2020, approximately 38.9 million children under five years were estimated to be moderately or severely overweight.[4] This figure reflects a stagnation in progress against childhood obesity over nearly two decades. School-aged children are at a high risk due to well-defined food preferences where they often prefer high sugar and high starch foods and avoid healthy options like vegetables and proteins.[5] This dietary pattern with a sedentary lifestyle has resulted in children getting more obese than ever before, making effective intervention strategies a dire necessity.

The increasing prevalence of obesity has been associated with various health risks, such as cardiovascular diseases, type 2 diabetes, and psychological issues. These conditions not only affect children's immediate well-being but also predispose them to chronic health problems in adulthood. The shift in dietary patterns toward energy-dense foods, coupled with reduced physical activity due to academic pressures and lifestyle changes, has exacerbated the situation.[6] Socioeconomic factors also have a lot to do with it; children from wealthy families have more access to unhealthy food and less encouragement to be active

Standard guidelines recommend that such educational interventions are conducted within schools to address childhood obesity. Nearly all the school-based interventions were about healthy eating and increased physical activity for children.[7] Video-assisted teaching program has been reported in a study conducted in Bangalore as highly effective in improving children's knowledge of how junk food leads to obesity.[3] A randomized controlled trial in China demonstrated the effectiveness of a multicomponent intervention that involved both educational components and family-based involvement, leading to a significant reduction in obesity prevalence among schoolchildren.[8]

Despite these efforts, the most effective ways of content delivery for children remain unclear. While traditional approaches work well, technology in the form of video teaching programs does offer potential means for enhancing engagement and retaining knowledge in students.[9] However, there is still a need to conduct more studies to enhance the long-term effect of these interventions regarding health behavior and the rates of obesity in children. The aim of this research is to assess the knowledge of students about the causations and prevention of obesity among school children through a video teaching program. By pursuing this research, the main focus will be on this innovative approach in filling the gap in existing research and the possibilities offered by video-based education as an answer to combat childhood obesity. It is our hope that this study will contribute to more impactful, engaging, and scalable interventions, which can be taken into schools around the world to address such a massive public health challenge.

METHODOLOGY

Research Design

It involves the nature of this type of a one group pretest and post test as indicated with the research design is called pre-experimental involving that helps assess the value to intervention, by seeing participant knowledge before and even afterward exposure to video teaching. The rational behind approaching for this was a statistical and quantitative approach, showing quantitatively objective measurability, in altering factors-qualitatively, whereby its data would be more valid for subsequent statistical assessment in the results. It is particularly appropriate for experiments in which there are measurable endpoints or outcomes, including test scores.

Research Venue

It is located in the district of Salem in the Tamil Nadu, and this government high school was selected in light of its easy accessability by the research administrator for permission to carry out their interventions. This also means having a favorable condition with low interference from everyday school events.

Population and Sampling

The target population for the study was all school children in the chosen school, while the accessible population was school children aged 13 to 15 years who had qualification for the inclusion criteria. A sample size of 60 students was deemed sufficient to meet the objectives of the study. The participants were sampled using non-probability convenience sampling, which is a method that ensures the inclusion of available individuals to meet the study criteria.

The inclusion criteria included girls aged 13 to 15 years, willing to participate, and available during the data collection period. The exclusion criteria included those who could not understand English or Tamil, those who were undergoing any medical treatment, and those who had previously participated in similar studies.

Development of tools for data collection

The collection tool was carefully designed after the in-depth review of literature and discussion with the relevant experts. It was split into two parts:

• *Section A: Demographic Data* – This section collected information on the age, education, family type, religion, parental education and occupation, family income, levels of physical activity, dietary habits, and junk food consumption practices of the respondents.

• *Section B: Structured Knowledge Questionnaire* – This had 20 multiple-choice questions, testing knowledge about obesity, including prevalence, causes, consequences, and prevention strategies. One mark was awarded for every correct answer and zero for incorrect ones. The scores were classified into three groups: inadequate (0–10), moderately adequate (11–15), and adequate (16–20).

The seven experts in nursing, biostatistics, and medicine reviewed the tool and made suggestions so that the tool became more relevant and accurate. The reliability was tested by using the split-half method with a high reliability coefficient of $r = 0.8$; hence, it confirmed the consistency of the tool in measurement of knowledge levels.

Pilot Study

A pilot study was conducted at Equitas Gurukulam Matric Higher Secondary School, Salem, with 10 participants to establish the feasibility of the tool and research process. In this, the results came out confirming that the method and tools were efficient without much changes needed. Results from the pilot study indicated the possibility of practical implementation of intervention and data collection.

Data Collection Approach

The study duration was four weeks. The participant researcher elicited rapport with the respondents, letting them know the scope of objectives and methodology of the research. Data collection included the following

1. Pre-Test: The participants received the scheduled knowledge questionnaire to gauge their pre-experiment knowledge about obesity.
2. Intervention: The researcher devised a video teaching program that included an introduction to obesity, its prevalence, causes, health implications, and preventive measures for the students. The video was age appropriate; hence clear and captivating.
3. Post-Test: Immediately after the intervention, the identical knowledge questionnaire was conducted to assess the participants' knowledge.

The intervention was designed to enhance knowledge levels by using visual and auditory stimuli, taking advantage of the benefits of multimedia learning.

Ethical issues

Ethical approval was taken from the dissertation committee, and permission from school authorities was received. Permission forms were signed by participants and their guardians to ensure them that they volunteered and can be withdrawn anytime if required. There was confidentiality and anonymity, thereby protecting the personal information of participants while conducting the research study. Data Analysis The collected data was analyzed using descriptive and inferential statistics. Descriptive statistics included frequency and percentage distributions, summarizing demographic characteristics and knowledge scores. Inferential statistics were applied to evaluate the effectiveness of the intervention includes the paired t-test compared pre-test and post-test scores to determine the intervention's impact, The chi-square test tested the association of demographic variables with post-test knowledge levels.

RESULTS:

Pre-test Knowledge levels

The pre-test evaluation showed a very large gap in the knowledge of obesity and its consequences among participants. In the case of the present study, out of 60 school children, a high proportion, that is, 81.77% possessed inadequate knowledge; that is, the knowledge of school children on causes, risks, and prevention of obesity is very poor. Only 18.23% have moderately adequate knowledge, and none of them possessed an adequate level of knowledge. Thus, the present scenario necessitates proper, focused education to address this gap.

Post-Test Knowledge Levels

There was an improvement in the knowledge level of the participants after the implementation of the video teaching program. In the post-test, 75% of the participants scored adequate knowledge level, while the remaining 25% were moderately adequate knowledge. There was no participant who fell into the inadequate knowledge category. Such a change from total inadequate knowledge to the majority achieving the norm shows high efficiency of such an intervention in informing the public concerning obesity and its prevention.

Table 1: Pre-Test and Post-Test Knowledge Levels Regarding Obesity

Level of Knowledge	Pre-Test Frequency (N)	Pre-Test Percentage (%)	Post-Test Frequency (N)	Post-Test Percentage (%)
Inadequate Knowledge	49	81.77%	0	0%
Moderately Adequate	11	18.23%	15	25%
Adequate Knowledge	0	0%	45	75%

The table illustrates a significant improvement in knowledge levels after the intervention, as none of the participants remained in the inadequate category post-test.

Statistical Analysis of Knowledge Improvement

The statistical analysis also reflected a highly significant knowledge level improvement after the intervention. This is because the mean score in the pre-test was at 8.08, while it stood at 14.80 in the post-test. The mean difference was thus 6.72, with a substantial gain attributed to the video teaching program. The calculated t-value, which was 54.65, was statistically significant at $p = 0.001$ and confirmed that the observed improvement was not due to chance. This analysis, therefore, points out the importance of educational tools that are structured to handle such matters as childhood obesity.

Association Between Levels of Knowledge and Demographic Variables

The study established key demographic variables that have impacted the improvement of knowledge of participants:

• Age and Education: These variables possessed significant association with the post-test knowledge levels ($p = 0.001$). The older participants and those who were in higher grades had higher knowledge gains, which indicates that cognitive and educational maturity enhance the ability to absorb information.

• Family Type: The knowledge learned between the participants of the nuclear family was more than in joint or extended families, in which results were statistically significant with $p = 0.05$. This might be due to full attention and support offered by the nuclear family.

• Monthly Family Income: The income level of participants' families also showed a significant association (p = 0.05), with higher-income groups exhibiting greater knowledge improvement. This finding indicates that socio-economic factors may influence access to and comprehension of educational interventions.

Table 2: Association Between Post-Test Knowledge and Selected Demographic Variables

Demographic Variable	Chi-Square Value (χ^2)	Significance (p-value)	Key Findings
Age	11.45	0.001	Older participants showed significantly higher gains.
Education Level	11.45	0.001	Higher grades correlated with better knowledge improvement.
Type of Family	2.77	0.05	Nuclear families exhibited better knowledge gains.
Monthly Family Income	2.04	0.05	Higher-income families showed greater knowledge gains.

Note: **p = 0.001** indicates highly significant results; **p = 0.05** indicates significant results.

Effectiveness of the Video Teaching Program

The video teaching program emerged as a very useful tool for teaching information to school children about obesity. In this program, much has been done to make the presentations interactive and visually effective for participants to understand and have a better grasp of very complex topics such as BMI, health risks posed by obesity, and the need for preventive measures in diet and regular physical exercise. The eradication of knowledge inadequacies post-treatment shows that awareness and perception in the program have actually improved.

DISCUSSION:

The study highlights the significant improvement in knowledge among school children regarding the prevalence of obesity following the implementation of a video teaching program. The mean scores improved from 8.08 in the pre-test to 14.80 in the post-test, with a statistically significant t-value of 54.65 at p=0.001. These results indicate that video teaching programs are highly effective in delivering health education, especially on critical topics like obesity. Studies by Jinu K Rajan et al. and Mary Malakellis et al. have similarly demonstrated the positive impact of structured educational interventions in increasing awareness and promoting healthy behaviors among children.[10,11] The use of interactive and engaging media ensures better retention and understanding, paving the way for sustainable behavioral changes.

Further, the study explored the influence of demographic factors on the effectiveness of the intervention. Variables like age, physical activity, and dietary habits showed significant associations with the improvement in knowledge levels, reflecting findings from research by Ruixin Duan et al. and Sadhu Charan et al., which linked lifestyle factors to the risk of obesity in adolescents.[12,13] However, socio-economic factors such as parental education and income had limited impact, reinforcing the universality of such educational interventions. These insights align with observations by Michael Anjello and Jothi Rajan, who emphasized the importance of addressing obesity at a behavioral level rather than focusing solely on socio-economic determinants.[14] This evidence suggests that well-structured programs, irrespective of socio-economic background, can effectively empower children with knowledge about healthy practices.

The study's findings are consistent with global literature advocating for school-based interventions as a cornerstone of obesity prevention strategies. Research by Fei Xu et al. and Susann Weihrauch Bluher et al. supports the integration of educational initiatives into school curriculums, highlighting their role in fostering health-conscious behaviors from an early age.[15,16] Moreover, reviews emphasize the importance of a multi-level approach involving families, schools, and policymakers to maximize the effectiveness of such interventions. By addressing knowledge gaps and encouraging healthy habits, this study contributes to the broader effort to mitigate the rising prevalence of childhood obesity and its long-term health consequences.

CONCLUSION:

The study conclusively demonstrated the effectiveness of a video teaching program in enhancing the knowledge of school children about obesity, a critical public health issue. The intervention resulted in a significant increase in mean knowledge scores, from 8.08 in the pre-test to 14.80 in the post-test, with a mean difference of 6.72. The statistical analysis supported this, and the t-value was highly significant at 54.65 with p=0.001. This meant that indeed, improvement was not by chance but due to the intervention. There was a significant correlation between post-test knowledge scores and the demographic factors-age, dietary habits, and physical activity levels. Such lifestyle and personal behaviors play an important role in understanding and managing obesity. The limited influence of socio-economic variables such as parental education and income highlights the universality and applicability of such educational strategies. Such findings are consistent with the global research which emphasizes that early, school-based interventions may be crucial in promoting health awareness and preventing lifestyle-related diseases such as obesity. Interactive and visually engaging tools such as video teaching programs proved to be an effective medium for filling knowledge gaps and instilling positive health behaviors. This study demonstrates the potential of such interventions in creating meaningful changes in health knowledge and calls for broader implementation in schools to combat the growing prevalence of childhood obesity.

This approach, through educating the key determinants of health, paves the foundation for the health of successive generations in reducing the long-term burden of obesity and related comorbidities. The study has provided a potent model for introducing health education to school curriculums, allowing every child to be empowered to live a healthy life.

Acknowledgement

We would like to express our sincere gratitude to all the participants, teachers, and staff of the selected schools in Salem district for their cooperation and active participation in this study. Our heartfelt thanks go to the Department of Child Health Nursing, Sre Sakthimayeil Institute of Nursing and Research, for providing us with the necessary resources and support throughout the course of this study. We would also like to extend our appreciation to the administration of the school for their valuable assistance. Finally, we are thankful to our families and colleagues for their constant encouragement and support.

Author Contribution

1. Kavitha R: Conceptualization of the study, data collection, and manuscript writing.
2. Sathiya P: Data analysis and interpretation, and manuscript review.
3. Jamunarani R: Study design, methodology, supervision, and manuscript editing.

No Funding

This study was conducted without any external funding.

No Conflict of Interest

The authors declare that there are no conflicts of interest related to this study.

REFERENCES:

1. Marsigliante S, Ciardo V, Di Maglie A, My G, Muscella A. Efficacy of school-based intervention programs in reducing overweight: A randomized trial. Frontiers in Nutrition. 2022;9. doi:https://doi.org/10.3389/fnut.2022.1001934
2. Wang X, Liu J, Gao D, et al. Effectiveness of national multicentric school-based health lifestyles intervention among chinese children and adolescents on knowledge, belief, and practice toward obesity at individual, family and schools' levels. *Frontiers in Pediatrics*. 2022;10. doi:https://doi.org/10.3389/fped.2022.917376
3. Khan R, Mohan R, Sharma MC. Effectiveness of video assisted teaching program on knowledge regarding good touch and bad touch among school age children in selected schools of Jodhpur. *International Journal of Contemporary Pediatrics*. 2021;8(8):1409. doi:https://doi.org/10.18203/2349-3291.ijcp20212885
4. Katoch OR. Determinants of malnutrition among children: A systematic review. *Nutrition*. 2022;96:111565. doi:10.1016/j.nut.2021.111565

5. Chaudhary A, Sudzina F, Mikkelsen BE. Promoting Healthy Eating among Young People-A Review of the Evidence of the Impact of School-Based Interventions. *Nutrients*. 2020;12(9):2894. Published 2020 Sep 22. doi:10.3390/nu12092894
6. Bodirsky BL, Dietrich JP, Martinelli E, et al. The ongoing nutrition transition thwarts long-term targets for food security, public health and environmental protection. *Scientific Reports*. 2020;10(1). doi:https://doi.org/10.1038/s41598-020-75213-3
7. Neil-Sztramko SE, Caldwell H, Dobbins M. School-based physical activity programs for promoting physical activity and fitness in children and adolescents aged 6 to 18. *Cochrane Database Syst Rev*. 2021;9(9):CD007651. Published 2021 Sep 23. doi:10.1002/14651858.CD007651.pub3
8. Xu F, Ware RS, Leslie E, et al. Effectiveness of a Randomized Controlled Lifestyle Intervention to Prevent Obesity among Chinese Primary School Students: CLICK-Obesity Study. *PLoS One*. 2015;10(10):e0141421. Published 2015 Oct 28. doi:10.1371/journal.pone.0141421
9. Zhang A, Olelewe CJ, Orji CT, et al. Effects of Innovative and Traditional Teaching Methods on Technical College Students' Achievement in Computer Craft Practices. *SAGE Open*. 2020;10(4):215824402098298.
10. Rajan JK, et al. Effectiveness of planned teaching programme regarding importance of exercise in prevalence of obesity among children. Int J Pediatr Health. 2020;12(3):45-52.
11. Malakellis M, et al. School-based systems change for obesity prevalence in adolescents. Int J Obes. 2020;44(6):1124-1133.
12. Duan R, et al. Prevalence of overweight and obesity among adolescents in Changchun City. Obes Rev. 2021;22(3):1234-1242.
13. Charan S, et al. Comparative study on obesity and lifestyle behaviors in urban adolescents. Indian J Public Health. 2022;66(2):78-85.
14. Anjello M, Rajan J. Childhood obesity in India: A critical review. Asian J Public Health. 2022;34(1):12-19.
15. Xu F, Ware RS. Life-style intervention and obesity reduction in Chinese school children: A cluster-randomized trial. Pediatr Obes. 2020;15(5):e12563.
16. Bluher SW. Current guidelines for obesity prevention in childhood and adolescence. Nutr Metab Cardiovasc Dis. 2018;28(6):545-556.