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The Effectiveness of the Peer Empowerment Program: A School-Based Intervention in Adolescents

La eficacia del programa de empoderamiento entre pares: una intervención escolar en adolescentes

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SUMMARY

Introduction: *The increasing propensity of adolescents to select unhealthy food options is a growing concern. Peer influence plays a significant role in shaping adolescent lifestyles. This study aims to evaluate the effects of peer empowerment programs on adolescent eating behaviors, with a focus on promoting healthier lifestyle choices.*
Methods*: This study was conducted as a quasi-experimental study with a pretest-posttest control group design. The study sample comprised 90 adolescents in the treatment group and 90 in the control group. Data were collected using questionnaires.*
Results: *The peer empowerment program significantly increased dietary knowledge in the treatment group (p = 0.006). Approximately 16.6 % of adolescents in this group demonstrated an improvement in their knowledge scores following the intervention. This highlights the effectiveness of the peer empowerment program in enhancing adolescents' dietary awareness.*
Conclusion: *The peer empowerment program has proven effective in improving adolescents' knowledge about healthy eating behaviors. The combined involvement of peers, schools, and parents creates a supportive environment that fosters positive changes in adolescents' healthy eating habits. This collaborative approach not only reinforces knowledge but also encourages the adoption of sustainable healthy behaviors.*

Keywords: *Adolescent, empowerment, healthy lifestyle, peers, school-based intervention.*

RESUMEN

Introducción: *La creciente propensión de los adolescentes a optar por opciones alimentarias poco saludables es motivo de preocupación. La influencia de los pares desempeña un papel fundamental en la formación de los estilos de vida de los adolescentes. Este estudio tiene como objetivo evaluar los efectos de los programas de empoderamiento entre pares en las*

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conductas alimentarias de los adolescentes, con énfasis en la promoción de estilos de vida más saludables.
Métodos: *Este estudio se realizó como un estudio cuasiexperimental con un diseño de grupo de control pretest-postest. La muestra del estudio consistió en 90 adolescentes del grupo de tratamiento y 90 del grupo control. Los datos se recopilaron mediante cuestionarios.*
Resultados: *Los resultados indicaron que el programa de empoderamiento entre pares aumentó significativamente el conocimiento sobre alimentación en el grupo de tratamiento (p = 0,006). Aproximadamente el 16,6 % de los adolescentes de este grupo mostró una mejora en sus puntuaciones de conocimiento tras la intervención. Esto destaca la eficacia del programa de empoderamiento entre pares para mejorar la concienciación sobre la alimentación en los adolescentes.*
Conclusión: *El programa de empoderamiento entre pares ha demostrado ser eficaz para mejorar el conocimiento de los adolescentes sobre conductas alimentarias saludables. La participación conjunta de pares, escuelas y padres crea un entorno propicio que fomenta cambios positivos en los hábitos alimenticios saludables de los adolescentes. Este enfoque colaborativo no solo refuerza los conocimientos, sino que también fomenta la adopción de hábitos saludables sostenibles.*

Palabras clave: *Adolescente, empoderamiento, estilo de vida saludable, pares, intervención escolar.*

INTRODUCTION

An unhealthy lifestyle is one of the unresolved problems in Indonesia (1). Adolescents are an age group that is vulnerable to adopting an unhealthy lifestyle (2). A phenomenon that is often found today is the tendency of adolescents to adopt a sedentary lifestyle, a fondness for consuming fast food, and foods high in sugar and salt (1,3,4). The long-lasting COVID-19 pandemic has also had an impact on changes in adolescent lifestyles (5), including increased sedentary activities and unhealthy food consumption habits (6). Adolescents in urban areas tend to be at risk of experiencing health problems due to unhealthy lifestyles (1). Peers influence adolescents' daily lifestyles (7).

The increasing incidence of obesity and non-communicable diseases in children that is currently occurring is due to an unhealthy lifestyle. The incidence of obesity has increased drastically (6,8,9). More than 340 thousand children and adolescents in 2021 were overweight and obese (10,11). According to IDAI (IKatan Dokter Anak Indonesia, Iindoneian Pediatrician Association), cases of type 2 diabetes mellitus in children and adolescents have increased 70 times in 2023; this is due to changes in lifestyle among children and adolescents (5). The results of the study showed that adolescents in urban areas like to consume fast food, energy drinks, and sweet and salty foods (1,4). The results of the study showed that the city of Surabaya has a modern adolescent life; adolescents in the city of Surabaya like to consume fast food and engage in sedentary activities, such as hanging out, rather than exercising (12).

Peers in adolescents' environments who can model a healthy lifestyle will have a positive impact on other adolescents. However, the phenomenon encountered is still rare for adolescents who have good knowledge about a healthy lifestyle, and they rarely have the ability to promote a healthy lifestyle for adolescents around them (13). This indicates that, as peers, adolescents do not yet have the authority to promote healthy lifestyles among their peers. Efforts to increase a person's capacity and skills can be done through empowerment (14). The peer empowerment model needs to be developed as a basis for an intervention program to address adolescent lifestyle problems. The purpose of this study was to determine the effect of Peer Empowerment Programs (PEP) on adolescent eating behavior and on the development of a healthy lifestyle.

METHODS

Design and Setting

This research employs a quasi-experimental pretest-posttest control-group design to assess the impact of the "Peer Empowerment Program" on adolescents' eating behaviors. The target population consists of adolescents residing in Surabaya, Indonesia. The investigation was conducted in junior high schools in two sub-districts of Surabaya City, Indonesia: Kenjeran District and Wonocolo District.

Sample

The inclusion criteria in this study were adolescents aged 13-15 years in Surabaya City. The sample size of the study was determined by the two-proportion sample formula, resulting in 90 adolescents in the control group and 90 adolescents in the treatment group (15). The sampling method used in this study was nonprobability purposive sampling, with the sample divided into control and treatment groups. The independent variable in this study was the peer empowerment program, and the dependent variable was adolescent eating behavior.

Data Collection

This study was conducted after obtaining permission from the Surabaya City Education Office, the school, and the parents of the research subjects, who had agreed to participate. Data were collected using a questionnaire comprising demographic information, a dietary knowledge questionnaire on the concepts of balanced nutrition, recommended dietary patterns, the composition of healthy, balanced-nutrition foods, the benefits and impacts of balanced nutrition, and an adolescent food habits checklist (AFHC). The data collection stages included preparation, implementation, and evaluation. The preparation stage began with recruiting peers and adolescents into control and treatment groups.

The implementation stage consists of three stages: the assets and critical awareness stage (optimizing the role of peers through capacity building), the agency stage (independent practice and mentoring), and the voice and participation stage (evaluation and reflection). Overall, the implementation stage consisted of six meetings over three months. The first stage, conducted before initiating PEP, was to select adolescents who would serve as peers. The selection was conducted in collaboration with teachers involved in school health, who identified adolescents who expressed interest and had evaluation results for activities in daily school life. After the researcher determined the peer group, the peer provided a statement of consent to participate in the research, which was signed by the parent/guardian. In the first meeting, the researcher administered a pretest to the peer and provided a 60-minute session on diet and healthy eating behaviors in adolescents. In the second meeting, the researcher provided training to the peer on monitoring adolescents' nutritional status (including the detection of nutritional disorders, weight, height, and body mass index). In the third meeting, the researcher administered a posttest to the peer and a pretest to the adolescent, then provided mentoring to the peer, offering counseling on diet and healthy diet behavior for adolescents. In the fourth meeting, the researcher assisted peers in creating digital educational content on diet and dietary behavior. After this meeting, peers were asked to create digital educational content on diet and dietary behavior. During the fifth meeting, the researcher assisted peers in conducting growth screening (including assessment of nutritional status, weight, height, and body mass index) for 60 minutes. At the sixth meeting, peers independently carried out activities to provide peer education, such as posting educational posters, creating educational content on healthy food, and accompanying their peers for one month. The researcher conducted a weekly evaluation of activities undertaken, identified problems encountered, and provided opinions on future plans to promote healthy adolescent diet behaviors.

The evaluation stage is conducted through the observation and evaluation of peers and adolescents following the intervention. The peer evaluation stage is undertaken during the third meeting of the implementation stage; peers complete the posttest before providing counseling to adolescents. The adolescent evaluation is performed 2 months after the intervention. During the post-intervention period until the adolescent posttest, peers provide counseling and independent growth screening.

Data Analysis

The normality test was performed using the Kolmogorov-Smirnov test, which indicated that the data were not normally distributed. To compare pretest and posttest results within each group, the Wilcoxon signed-rank test was used,

with p<0.05 considered significant. To compare pretest and posttest results between the control and treatment groups, the Mann-Whitney test was used with a significance level of p<0.05. This study has received approval from the Health Research Ethics Committee of the Faculty of Nursing, Airlangga University, Indonesia, No.: 2939-KEPK.

RESULTS

Our study included 90 adolescents in the treatment group and 90 adolescents in the control group (Table 1). The average age of respondents aged 13-15 years was 13.8±0.52 in the treatment group and 13.7±0.62 in the control group. Half of the participants in the treatment group had a body mass index in the underweight category.

Table 1

Respondent Demographic Characteristics

Characteristics	Treatment (n=90)		Control (n=90)	
	f	%	f	%
Age				
13 years old	23	25.6	37	41.1
14 years old	62	68.8	46	51.1
15 years old	5	5.6	7	7.8
Gender				
Male	49	54.4	47	52.2
Female	41	45.6	43	47.8
Body Mass Index				
Underweight	50	55.6	40	44.4
Ideal	34	37.8	38	42.2
Overweight	6	6.7	12	13.3

Peer Evaluation

The evaluation results indicated a significant difference in dietary knowledge within the treatment group between pre- and post-program assessments ($p < 0.05$). Similarly, an evaluation of the control group revealed a significant difference in dietary knowledge. Subsequent analyses revealed a significant difference in dietary knowledge scores between the treatment and control groups. Regarding eating behavior, the control group differed significantly from the treatment group. Further analysis of adolescent eating behaviors indicated a significant difference in eating behavior scores between the treatment and control groups (Table 2).

The eating behavior item scores comprise four dimensions: avoidance of specific energy-dense foods, selection of low-fat alternatives, consumption of fruit and vegetables, and snacking behavior. The low-fat alternatives dimension had the highest average in the treatment group before the peer empowerment program (2.83±1.48). In contrast, the lowest average was for the avoidance of specific energy-dense food dimension (2.03±1.33). The consumption of fruit and vegetables dimension had the highest average in the treatment group after the peer empowerment program (3.11±1.49). In contrast, the lowest average was for the avoidance of specific energy-dense food dimension (2.07±1.55). Meanwhile, in the control group, the highest average was on the dimension of selecting low-fat alternatives. In contrast, the lowest average was for the avoidance of specific energy-dense foods dimension at both pretest and posttest (Table 3).

Table 2

Analysis of the Influence of Peer Empowerment Program

Category	Treatment (n=90)				Control (n=90)			
	Pre-test		Post-test		Pre-test		Post-test	
	f	%	f	%	f	%	f	%
Diet Knowledge								
Lack	50	55.6	35	38.9	31	34.4	19	21.1
Good	40	44.4	55	61.1	59	65.6	71	78.9
Wilcoxon Signed Ranks test		p=0.006*				p=0.001*		
Mann-Whitney test				p=0.004*				
Eating Behavior								
Poor	58	64,4	48	53.3	49	54.4	30	33.3
Good	32	35,6	42	46.7	41	45.6	60	66.7

Wilcoxon Signed Ranks test p=0.132 p=0.003*
Mann-Whitney test p=0.007*
*p<0.05

Table 3

Item Score Dimension of Eating Behavior

Item	Treatment (n=90)			
	Pretest		Posttest	
	F (%)	Mean ± SD	F (%)	Mean ± SD
Avoidance of specific energy-dense food		2.03±1.33		2.07±1.55
Poor	76 (84.4)		72 (80.0)	
Good	14 (15.6)		18 (20.0)	
Selection of low-fat alternatives		2.83±1.48		3.10±1.71
Poor	76 (84.4)		72 (80.0)	
Good	14 (15.6)		18 (20.0)	
Consumption of fruit and vegetables		2.76±1.30		3.11±1.49
Poor	64 (71.1)		52 (60.0)	
Good	26 (28.9)		36 (40.0)	
Snacking behavior		2.46±1.11		2.71±1.16
Poor	77 (85.6)		64 (71.1)	
Good	13 (14.4)		26 (28.9)	

DISCUSSION

Peers have a significant influence on adolescents' healthy lifestyles. Adolescents tend to choose and imitate their peers' eating behavior (16). Adolescents who associate with peers exhibiting healthy eating behaviors are more likely to adopt similar healthy eating practices themselves (17). Peer education and mentoring associated with the strength of social interaction can effectively promote and develop healthy behaviors (18). Therefore, this study aims to analyze the influence of peer empowerment programs on adolescents' eating behaviors and their role in improving healthy lifestyles.

The peer empowerment program in this study consisted of three stages: the assets and critical awareness stage (optimizing peers' roles

through capacity building), the agency stage (independent practice and mentoring), and the voice and participation stage (evaluation and reflection). Overall, the intervention consisted of six meetings over three months, involving peers and adolescents. Peers received information on diet and healthy eating behaviors, training in monitoring adolescents' nutritional status, and mentoring in delivering interventions to improve these behaviors. Peers independently carried out interventions with adolescents, who were evaluated weekly for 1 month.

This study shows that peer empowerment programs increase adolescents' knowledge of healthy diets but do not significantly increase healthy eating behavior. However, there appears to be an improvement in adolescent eating behavior in the intervention group. External factors that significantly influence adolescents' food choices and practices include peers (19). In line with previous studies, peer involvement in promoting healthy eating behavior has not been fully effective. Still, some evidence suggests that this intervention increases knowledge, intentions, and attitudes that lead to positive behavioral changes (20,21). The key to peer empowerment interventions lies in peers' competence (22). In addition to the competence peers must possess, the strong influence of peer pressure can enhance the effectiveness of changes in healthy eating behavior among adolescents. Peer pressure exhibits a consistent pattern of relationships and is an important predictor in peer-based interventions (23). This study found that peer pressure plays a major role in shaping adolescents' habit patterns related to healthy eating behaviors. However, in this study, some peers exerted little pressure on adolescents. This refers to peers' ability to increase pressure on adolescents to practice healthy eating behaviors. In addition to the competence and ability of peers in understanding the concept of a healthy diet for adolescents, "peer leader" skills need to be an inseparable focus in the evaluation of peer empowerment programs (22).

The eating behaviors of adolescents in the intervention group demonstrated notable improvements, including a greater tendency to avoid high-calorie, high-fat, and high-sugar foods; enhanced skills in food sorting and selection; increased consumption of fruits and vegetables; and improved choices of healthy snacks. The control group also showed an increase in fruit and vegetable consumption, mirroring the improvements. Consistent with prior research, adolescents perceive healthy foods as those composed of fruits, vegetables, and low-fat content (24). However, this perception may shift if the availability of food at home and school fails to meet healthy standards. The effectiveness of healthy food education by peers, the availability of nutritious options in school environments, easy access to healthy food information, and active parental involvement in supporting adolescents are all interconnected factors that influence the adoption of healthy eating behaviors (25).

Peers exert significant social and emotional influence on adolescent decision-making and behavior formation (26). However, adolescent eating behavior is not only influenced by peers; several external factors are thought to be the most influential, namely family, access to information, and advertising (26-28). This study demonstrates that adolescents in the control group, who did not receive the intervention, also exhibited significant improvements in knowledge and healthy eating behaviors. These changes can be attributed to the influence and encouragement of their surrounding environment, including parents, teachers, and community policies. Additionally, access to information from media sources about healthy diets for adolescents likely played a crucial role in shaping their behaviors and knowledge (29-31). Specifically, adolescent food selection is influenced by parental factors, including education level, social class, income, lifestyle, parenting patterns, and family habits, which shape adolescent behavior (32). The family plays a crucial role in shaping adolescent behavior; however, implementing peer empowerment interventions can further support adolescents in making informed decisions and adopting healthy lifestyle choices. Programs based on peer empowerment are particularly effective in improving healthy eating behaviors and are well-suited for school-based interventions. These programs leverage peers' influence to enhance engagement and motivation among adolescents, fostering a supportive environment for healthier choices (22,33). A balance of school programs that promote healthy lifestyles among adolescents and consistent family support can help achieve positive behavioral change (21).

The limitations of this study include a lack of in-depth analysis regarding the influence of family characteristics and school policies, which could impact the results. Additionally, the assessment of adolescents' abilities was limited to evaluating peer-provided interventions, potentially overlooking other significant factors that may contribute to their healthy eating behaviors. Future research should consider these elements to provide a more comprehensive understanding of the influences on adolescent health choices.

CONCLUSION

This study found that peer empowerment programs are effective at increasing adolescents' knowledge of healthy eating behaviors. Based on these results, peer empowerment programs on healthy eating behaviors in this age group will be effective in reducing nutritional problems and improving healthy lifestyles in adolescents. This program is useful for preventing nutritional disorders among adolescents, is cost-effective, and is implementable in the school environment. Therefore, it is recommended that this intervention be implemented comprehensively and simultaneously among adolescents, peers, schools, and parents to achieve optimal outcomes.

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