



THE IMPLEMENTATION OF GREW-DEAL NURSING INTERVENTIONS TO ACHIEVE IDEAL BODY WEIGHT IN HIGH SCHOOL STUDENTS

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ABSTRACT

The number of cases of excess weight among teenagers is still high. This places teenagers in a group at high risk of experiencing long-term health problems. The aim of writing a scientific paper is to analyze the application of GREW-DEAL innovation in family and community nursing. This study is a case study. The sample used was 10 managed families and 90 private high school students in Depok City. The results of 10 families showed an increase in the average knowledge from 15.6 to 19.0, then attitudes from 13.9 to 16.8 and skills from 21.2 to 29.2, then there was a decrease in the average BMI from 21.58. to 20.28 and increased family independence (100%) between pre and post scores. The application of GREW-DEAL to adolescents at school also shows an increase in average knowledge, attitudes and skills. Apart from that, there has been an improvement in healthy eating patterns, increased activity and physical exercise. The GREW-DEAL innovation is a recommendation for community nurses in preventing and controlling excess weight in adolescents and is the basis for developing other innovations within the scope of family and community nursing care.

Keywords: adolescents; ideal body weight; nursing intervention

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INTRODUCTION

Globally, the prevalence of obesity has increased among adolescents. The global prevalence of obesity was 4% in 1975, increasing to more than 18% in 2016 (Bani Issa et al., 2020). The incidence of obesity among teenagers in Indonesia is still quite high. Based on Riskesdas 2018, the prevalence of obesity in adolescents aged 13-15 is 4.8%. Meanwhile, the prevalence of obesity in adolescents aged 16-18 years is 4.0% (Riskesdas, 2018). Healthy teenagers are characterized by weight, height and body mass index that are appropriate for their age (IDAI, 2013; Kemenkes, 2023). Health problems in teenagers are generally caused by lifestyle changes that tend to be unhealthy. Current lifestyle changes in teenagers include changes in eating patterns and physical activity patterns. Teenagers today prefer to consume fast food, snacks, and even unhealthy diet behavior. Apart from that, teenagers tend to be lazy about moving around for physical activity and prefer to sit together with family and friends while playing on their cellphones. This lifestyle risks causing health problems if teenagers are not given the correct understanding regarding a healthy lifestyle. Health problems that can occur are over-nutrition problems including overweight and obesity (Telisa et al., 2020).

Adolescent obesity is a serious health problem and a public health problem that requires immediate attention. Adolescent obesity is associated with an increased risk of diabetes,

stroke, cardiovascular disease and hypertension as well as cancer in adulthood which increases the risk of premature death (Bani Issa et al., 2020). The government through the Ministry of Health has made efforts to prevent an increase in adolescent obesity rates by implementing a balanced nutrition policy through specific interventions by monitoring children's growth and development (Kemenkes, 2014). The Healthy Living Community Movement Program or GERMAS, one of the focus activities is preventing health problems by actively carrying out regular physical exercise (Inpres, 2017). The Nusantara Movement to Reduce Obesity (GENTAS) is also an effort to overcome one of the nutritional problems, including obesity, where the movement is carried out to reduce the incidence of obesity by implementing several healthy lifestyle patterns, namely nutritional management and increasing physical activity and physical exercise (Inpres, 2017).

Handling the problem of adolescent obesity requires innovative programs that can combine several activities such as nutritional management, physical exercise and physical activity. The development of an innovation program that combines these three elements, namely GREW-DEAL (Goals for reaching ideal weight with diet, exercise and physical activity), is a website-based innovation that combines several ways to prevent obesity by paying attention to risk factors that can cause obesity. These risk factors include unhealthy eating patterns, lack of physical exercise and physical activity so that the strategy used can change unhealthy eating patterns to healthy ones by adjusting the diet, then increasing physical exercise and physical activity. Based on the problems, the resident aims to apply GREW-DEAL (Goals for Reaching Ideal Weight with Diet, Exercises and Physical Activity) to achieve ideal weight in adolescents to provides an overview of the implementation of the GREW-DEAL nursing intervention to achieve ideal body weight in high school students.

METHOD

The approach used in writing reports on the results of the implementation of residency activities is a case study. The GREW-DEAL intervention was implemented on 90 grade 10 high school students in Depok City and 10 families with one main managed family using the form of pre and post activity evaluation. Primary data was studied using observation, interviews and questionnaires. The questionnaire used includes demographic data, knowledge, attitudes, skills, dietary habits, physical activity habits which have been tested for validity and reliability. Furthermore, the physical exercise questionnaire used the Godin Leisure Time Exercise Questionnaire instrument with a reliability value of 0.74 which was filled in by students online via google form and manually by their families. The steps for implementing the activity are as follows the preparation stage starts with preparing the instrument, including making and testing its validity and reliability and coordinating with the managed family and school. The implementation stage consists of assessment, data analysis and enforcement of nursing diagnoses. The next step is to score priority nursing problems and design a nursing care plan. The nursing care plans carried out for the 10 managed families include increasing health awareness, health education, decision making support, counseling, nutritional management, activity therapy, behavior modification, increasing family involvement and health system assistance. Meanwhile, nursing interventions for students at school include nutritional management, health education, health screening, activity therapy, behavior modification and increased exercise.

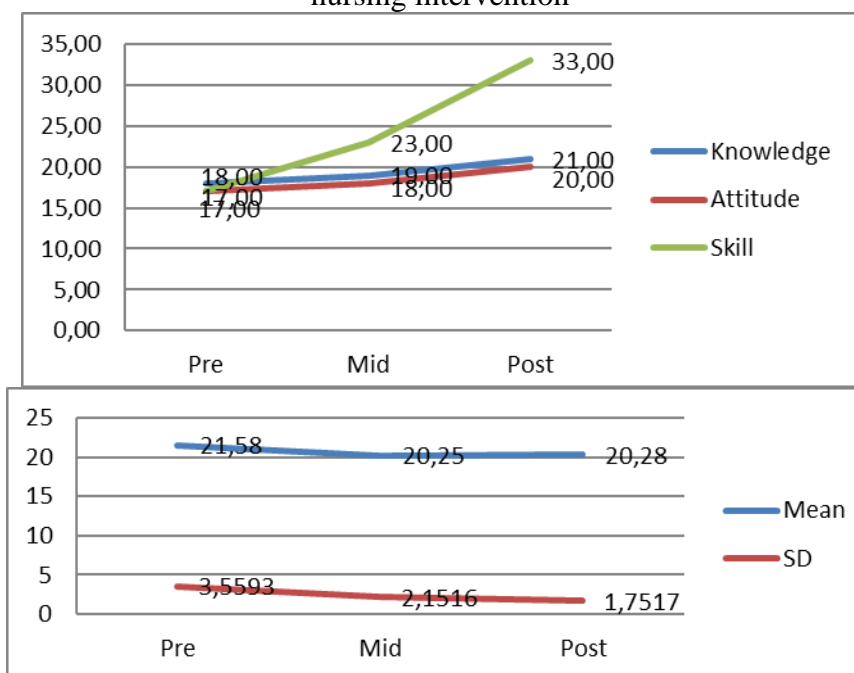
RESULTS

Evaluation of GREW-DEAL Implementation in Families

The average knowledge increased by 14.78% between before and after the intervention. The mean attitude score also increased by 14.5% between before and after the intervention.

Furthermore, the skill variable increased by 18.18% before and after the intervention (Graph 1).

Graph 1 Description of adolescent knowledge, attitudes and behavior before, mid and after nursing intervention



Adolescents' body mass index (BMI) decreased during the middle of the intervention and after the intervention but was included in the normal nutritional status category (Graph 2).

Table 1. Level of Family Independence Before and After Intervention

Family Management	Level of Family Independence								Percentage Increase
	Pre				Post				
	I	II	III	IV	I	II	III	IV	
K1		√						√	50%
K2		√						√	50%
K3	√						√		50%
K4	√						√		50%
K5	√						√		50%
K6		√						√	50%
K7			√					√	25%
K8		√					√		25%
K9	√						√		50%
K10	√						√		50%

Table 1 explains the level of family independence, showing that the level of family independence after being given family nursing intervention was 60% with family independence level III and 40% had family independence level IV.

Evaluation of GREW-DEAL Implementation in the Community

Table 2.

Evaluation of knowledge, attitudes and skills of adolescents before and after intervention

Variable	Time	f	Mean	SD	P value
Knowledge	Pre	90	15.93	2.312	0.0001
	Post	90	18.49	2.189	
	Difference		-2.56	0.123	
Attitude	Pre	90	13.50	1.743	0.0001
	Post	90	16.76	1.724	
	Difference		-3.26	0.019	
Skills	Pre	90	22.61	2.944	0.0001
	Post	90	29.23	4.084	
	Difference		-6.62	-1.14	

Table 2 explains the results of the analysis showed that there were significant changes in knowledge, attitudes and skills before and after the intervention was given with a p value of 0.0001 < 0.05.

Table 3 .

Nutritional status of adolescents before and after intervention

Nutritional Status	Pre		Post		P value
	f	%	f	%	
Thin	40	44.4	15	16.7	0,028
Normal	32	35.6	65	72.2	
Overweight	7	7.8	4	4.4	
Obesity	11	12.2	6	6.7	
Total	90	100	90	100	

Table 3 shows that the number of teenagers who have normal nutritional status is greater than those with other nutritional status. Apart from that, there was an increase in the number of teenagers with normal nutritional status by 36.6%. The results of the analysis showed that there was a significant difference in the nutritional status of adolescents before and after the intervention with a p value of 0.028 < 0.05.

Diagram 1 Body mass index (BMI) before and after intervention

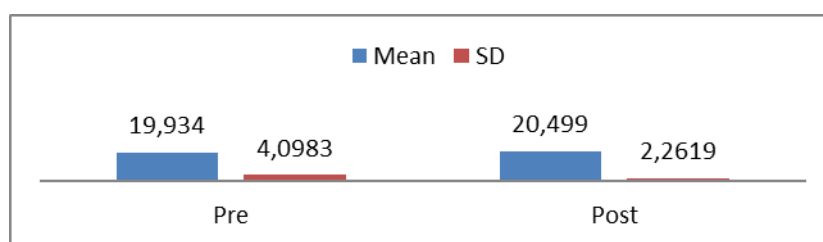


Diagram 1 explains the increase in the average body mass index (BMI) before and after the intervention of 0.565 points with a standard deviation (SD) of 2.2619, meaning that there was not much change in the average body mass index of teenagers before and after the intervention.

DISCUSSION

nutritional health (Herdman et al., 2021). The intervention chosen to resolve the diagnosis of ineffective adolescent eating dynamics in primary managed families consists of increasing health awareness, health education, decision making support, counseling, nutritional management, activity therapy, behavior modification, increasing family involvement and health system assistance. Increasing health awareness is the first intervention given to families. Increasing health awareness can help individuals and families who have limited abilities to obtain, process and understand information related to health and disease (Bulechek

& McCloskey, 2018). Nutrition management and behavior modification is one of the interventions included in the GREW-DEAL innovation component. Food behavior (regular family meal consumption, fruit and vegetable consumption) is positively related to excess body weight (Jonsson et al., 2024). Good nutritional management will influence health attitudes and behavior and is an important intervention in preventing and controlling obesity (Dlamini et al., 2024). In line with other research, nutritional management as part of interventions carried out on adolescents at school can improve nutritional status (Raut et al., 2024).

Another component of the GREW-DEAL innovation is physical activity and physical exercise so that the interventions carried out are activity therapy and increased activity. According to Ingersoll (2021) optimal physical exercise can reduce around 10% of body weight. Cunningham et al (2020) research explains the direct determinants of nutritional status in adolescents in Nepal. Reporting research results that there is a significant relationship between physical exercise and nutritional status. It was also explained that the average time spent by teenagers doing physical exercise per day was 4 hours for early teenagers aged 10 to 14 years and 4.2 hours for late teenagers aged 15 to 19 years. Based on research by Gali et al (2017) reported that there was a relationship between heavy and moderate sports activities with overweight and obesity in adolescents. It was further explained that physical activity had a significant relationship with overweight and obesity in adolescents. The risk of being overweight and obese in teenagers who do not actively do physical exercise is 3.7 times greater than in teenagers who actively do physical exercise.

The level of family independence increased in the ten largest families from a level of independence of one before the intervention to an independence of three after the intervention, then there was a decrease in BMI from 21.58 before the intervention to 20.28 after the intervention. Body mass index (BMI) is a person's weight in kilograms divided by the square of their height in meters, where a high BMI value can indicate a high level of body obesity. BMI can screen for weight categories that can cause health problems (CDC, 2024). According to Scaglioni et al (2018) the family has an important role in promoting and shaping children's eating behavior, parents have a strong influence in shaping children's eating preferences. The GREW-DEAL innovation is designed to facilitate family independence in providing care for adolescents at risk of being overweight in controlling various risk factors through increasing knowledge, attitudes and skills.

The average BMI increased after the GREW-DEAL intervention from 19,934 to 20,499 where the increase occurred because the nutritional status before the intervention was mostly in the thin category at 44.4% and normal at 35.6% so that after the intervention the BMI increased but was still within the normal. Even though the average BMI has increased, the number of adolescents with overweight nutritional status has decreased from 7.8% (before intervention) to 4.4% (after intervention) and obesity from 12.2% (before intervention) to 6.7 % (after intervention). GREW-DEAL which is implemented by residents in school students is effective in controlling body mass index, where the BMI value can determine a person's nutritional status. The application involves several components consisting of diet, physical exercise and physical activity. Interventions that combine diet with physical activity and behavior change may have a small, short-term impact in reducing weight among children and adolescents who are overweight or obese. This intervention can reduce body weight by 3.67 kg and BMI persists 18 to 24 months after the intervention (Mayor, 2017). Combination lifestyle interventions have been shown to improve maintenance of weight loss (Foltz et al., 2011; Lagerros & Rössner, 2013). Similar research explains that an intervention that

combines a low carbohydrate and low sugar diet with moderate intensity physical activity such as aerobic exercise 3 to 4 times per week with an exercise duration of 45-60 minutes per session results in a decrease in the average BMI percentile (Moran-Lev et al., 2023).

The GREW-DEAL innovation is designed with an attractive appearance and allows teenagers to screen for excess weight independently. In addition, teenagers can enter daily activities into the application so that risk factor control can be more optimal. Visual presentations are sensitive for adolescents who are obese, but can also be an alternative for obtaining health information (Holmberg et al., 2018). In line with other research which explains that website-based obesity prevention and control interventions have an impact on changing the average knowledge of healthy eating and can control maladaptive behavior related to various risk factors for obesity in adolescents (Francis et al., 2023).

The evaluation results show that there has been a significant increase in knowledge regarding excess body weight and risk factors between before and after the implementation of the GREW-DEAL innovation. In line with research results, the development of nutrition education programs can increase nutritional knowledge, eating habits, nutritional status and health, including reducing the prevalence of obesity (Hamulka et al., 2023). This is also in line with other research that the knowledge of children and adolescents is significantly related to being overweight or obese (Xu et al., 2022). Attitudes have cognitive components (beliefs and knowledge), affective components (feelings and emotions) and behavior (Marcinkowski & Reid, 2019). Research explains that changing perceptions about body weight will influence weight control behavior (Napolitano et al., 2019). The evaluation results showed an increase in the average attitude of teenagers before and after being given the implementation of the GREW-DEAL innovation. Attitude will help teenagers in making decisions. This is in line with research by Olfert et al (2019) that attitude values are in line with knowledge values which influence a person in making their own decisions regarding diet and food so that this period is an ideal time to provide health education interventions. Awareness and attitude are closely related and are important components in efforts to prevent and control excess body weight.

CONCLUSION

GREW-DEAL innovation in community nursing care is carried out from assessment to evaluation. The assessment was carried out by filling out a questionnaire via Google form which assessed adolescent habits (diet, physical activity and physical exercise) as risk factors for being overweight and knowledge, attitudes and behavior related to excess weight and steps to control it. The results of the intervention show that the GREW-DEAL innovation can improve knowledge, attitudes and skills as well as control body mass index (BMI) within the normal range and increase family self-management.

REFERENCES

- Baniissa, W., Radwan, H., Rossiter, R., Fakhry, R., Al-Yateem, N., Al-Shujairi, A., Hasan, S., MacRidis, S., Farghaly, A. A., Naing, L., & Awad, M. A. (2020). Prevalence and determinants of overweight/obesity among school-aged adolescents in the United Arab Emirates: A cross-sectional study of private and public schools. *BMJ Open*, 10(12), 1–12. <https://doi.org/10.1136/bmjopen-2020-038667>
- Bulechek, G. M., & McCloskey, J. C. (2018). Nursing interventions classification (NIC). *Medinfo. MEDINFO*, 8 Pt 2, 1368. <https://doi.org/10.1097/00006216-199317030-00016>

- CDC. (2024). Body Mass Index (BMI). Health Weight, Nutrition and Physical Activity. <https://www.cdc.gov/healthyweight/assessing/bmi/index.html>
- Cunningham, K., Pries, A., Erichsen, D., Manohar, S., & Nielsen, J. (2020). Adolescent girls' nutritional status and knowledge, beliefs, practices, and access to services: An assessment to guide intervention design in nepal. *Current Developments in Nutrition*, 4(7), nzaa094. <https://doi.org/10.1093/cdn/nzaa094>
- Dlamini, S. N., Mtintsilana, A., Mapanga, W., Craig, A., & Norris, S. A. (2024). Associations between nutrition knowledge and obesity-related attitudes and physical activity among young adults from Kenya, South Africa, and the United Kingdom. *South African Journal of Clinical Nutrition*, 37(1), 9–22. <https://doi.org/10.1080/16070658.2023.2198844>
- Foltz, J. L., Cook, S. R., Szilagyi, P. G., Auinger, P., Stewart, P. A., Bucher, S., Dipl, D., & Baldwin, C. D. (2011). US adolescent nutrition, exercise, and screen time baseline levels prior to national recommendations. *Clinical Pediatrics*, 50(5), 424–433. <https://doi.org/10.1177/0009922810393499>
- Francis, L. A., Nix, R. L., BeLue, R., Keller, K. L., Kugler, K. C., Rollins, B. Y., & Savage, J. S. (2023). Designing a childhood obesity preventive intervention using the multiphase optimization strategy: The Healthy Bodies Project. *Clinical Trials*, 20(4), 434–446. <https://doi.org/10.1177/17407745231167115>
- Gali, N., Tamiru, D., & Tamrat, M. (2017). The Emerging Nutritional Problems of School Adolescents: Overweight/Obesity and Associated Factors in Jimma Town, Ethiopia. *Journal of Pediatric Nursing*, 35(2017), 98–104. <https://doi.org/10.1016/j.pedn.2017.03.002>
- Hamulka, J., Czarniecka-Skubina, E., Gutkowska, K., Drywień, M. E., & Jeruszka-Bielak, M. (2023). Nutrition-Related Knowledge, Diet Quality, Lifestyle, and Body Composition of 7–12-Years-Old Polish Students: Study Protocol of National Educational Project Junior-Edu-Żywnienie (JEŻ). *Nutrients*, 16(1), 4. <https://doi.org/10.3390/nu16010004>
- Herdman, H. T., Kamitsuru, S., & Takao Lopes, C. (2021). NANDA International, Inc. nursing diagnoses : definitions and classification.
- Holmberg, C., Berg, C., Hillman, T., Lissner, L., & Chaplin, J. E. (2018). Self-presentation in digital media among adolescent patients with obesity: Striving for integrity, risk-reduction, and social recognition. *DIGITAL HEALTH*, 4, 205520761880760. <https://doi.org/10.1177/2055207618807603>
- IDAI. (2013). Kesehatan Remaja di Indonesia. Ikatan Dokter Anak Indonesia. <https://www.idai.or.id/artikel/seputar-kesehatan-anak/kesehatan-remaja-di-indonesia>
- Ingersoll, A. B. (2021). Current Evidence-Based Treatment of Obesity. *Nursing Clinics of North America*, 56(4), 495–509. <https://doi.org/10.1016/j.cnur.2021.07.011>
- Inpres. (2017). Gerakan Masyarakat Hidup Sehat.
- Jonsson, K. R., Bailey, C. K., Corell, M., Löfstedt, P., & Adjei, N. K. (2024). Associations between dietary behaviours and the mental and physical well-being of Swedish adolescents. *Child and Adolescent Psychiatry and Mental Health*, 18(1), 43. <https://doi.org/10.1186/s13034-024-00733-z>

- Kemenkes. (2014). *Pedoman Gizi Seimbang*. 634.
- Kemenkes. (2023). *Remaja 10-19 Tahun*. Kementerian Kesehatan RI. <https://ayosehat.kemkes.go.id/kategori-usia/remaja>
- Lagerros, Y. T., & Rössner, S. (2013). Obesity management: What brings success? *Therapeutic Advances in Gastroenterology*, 6(1), 77–88. <https://doi.org/10.1177/1756283X12459413>
- Marcinkowski, T., & Reid, A. (2019). Reviews of research on the attitude–behavior relationship and their implications for future environmental education research. *Environmental Education Research*, 25(4), 459–471. <https://doi.org/10.1080/13504622.2019.1634237>
- Mayor, S. (2017). Combination of diet, exercise, and behaviour change may help weight loss in child obesity. *BMJ (Online)*, 357. <https://doi.org/10.1136/bmj.j3029>
- Moran-Lev, H., Vega, Y., Kalamitzky, N., Interator, H., Cohen, S., & Lubetzky, R. (2023). Factors Associated With Treatment Adherence to a Lifestyle Intervention Program for Children With Obesity: The Experience of a Large Tertiary Care Pediatric Hospital. *Clinical Pediatrics*, 62(4), 269–275. <https://doi.org/10.1177/00099228221123381>
- Napolitano, F., Bencivenga, F., Pompili, E., & Angelillo, I. F. (2019). Assessment of Knowledge, Attitudes, and Behaviors toward Eating Disorders among Adolescents in Italy. *International Journal of Environmental Research and Public Health*, 16(8), 1448. <https://doi.org/10.3390/ijerph16081448>
- Olfert, M. D., Hagedorn, R. L., Leary, M. P., Eck, K., Shelnut, K. P., & Byrd-Bredbenner, C. (2019). Parent and School-Age Children’s Food Preparation Cognitions and Behaviors Guide Recommendations for Future Interventions. *Journal of Nutrition Education and Behavior*, 51(6), 684–692. <https://doi.org/10.1016/j.jneb.2019.01.022>
- Raut, S., KC, D., Singh, D. R., Dhungana, R. R., Pradhan, P. M. S., & Sunuwar, D. R. (2024). Effect of nutrition education intervention on nutrition knowledge, attitude, and diet quality among school-going adolescents: a quasi-experimental study. *BMC Nutrition*, 10(1), 35. <https://doi.org/10.1186/s40795-024-00850-0>
- Riskesdas. (2018). *Laporan Nasional Riset Kesehatan Dasar 2018*. In *balitbang* (p. 198). http://labdata.litbang.kemkes.go.id/images/download/laporan/RKD/2018/Laporan_Nasional_RKD2018_FINAL.pdf
- Scaglioni, S., De Cosmi, V., Ciappolino, V., Parazzini, F., Brambilla, P., & Agostoni, C. (2018). Factors Influencing Children’s Eating Behaviours. *Nutrients*, 10(6), 706. <https://doi.org/10.3390/nu10060706>
- Telisa, I., Hartati, Y., & Haripamilu, A. D. (2020). Faktor Risiko Terjadinya Obesitas Pada Remaja SMA Risk Factors of Obesity among Adolescents in Senior High School. 7(3), 124–131.
- Xu, Z., Zhao, Y., Sun, J., Luo, L., & Ling, Y. (2022). Association between dietary knowledge and overweight and obesity in Chinese children and adolescents: Evidence from the China Health and Nutrition Survey in 2004–2015. *PLOS ONE*, 17(12), e0278945. <https://doi.org/10.1371/journal.pone.0278945>