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The Effect of Education with T-Plate Modeling on Mothers' Knowledge about Obesity Diet

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ABSTRACT

The GENTAS program (Gerakan Nusantara Tekan Angka Obesitas) recommends the use of the T plate model in one of its programs to reduce the prevalence of obesity. He purpose of this study was to determine the effect of education with T plate modeling on maternal knowledge about obesity diet. This study used a quasi-experiment with a one-group pretest-posttest approach, involving 18 mothers from RW 04,05, and 06 Harapan Mulya Village, Kemayoran District, Central Jakarta. Mothers' knowledge was measured using a questionnaire on obesity diet management knowledge given before and after education using the T-shaped Plate modeling. Data analysis used the Wilcoxon Test technique with a p-value of 0.05. Data analysis using Jamovi 2.3.28 software. The results of the analysis using the Wilcoxon test obtained the t value on the obesity diet knowledge variable, both pre-test and post-test, with a p-value of 0.001 (p <0.05) and an effect size of -1.00. This means that there is an effect of education with T plate modeling on obesity diet knowledge before and after intervention.

ABSTRAK

Program GENTAS (Gerakan Nusantara Tekan Angka Obesitas) menganjurkan penggunaan piring makan model T dalam salah satu gerakannya untuk menurunkan prevalensi obesitas. Tujuan penelitian ini adalah mengetahui pengaruh edukasi dengan pemodelan Piring T terhadap pengetahuan ibu mengenai diet obesitas. Penelitian ini menggunakan quasi-experimen dengan pendekatan *one group pretest postest*, yang melibatkan 18 ibu dari RW 04,05, 06 Kelurahan Harapan Mulya, Kecamatan Kemayoran, Jakarta Pusat. Pengetahuan ibu diukur menggunakan kuesioner pengetahuan pengelolaan diit obesitas yang diberikan sebelum dan sesudah edukasi menggunakan pemodelan Piring T. Analisis data menggunakan teknik Uji Wilcoxon dengan p-value 0,05 Analisis data dengan menggunakan software Jamovi 2.3.28. Hasil analisa dengan menggunakan uji Wilcoxon diperoleh nilai t hitung pada variabel pengetahuan diet obesitas baik pre-test dan post-test dengan *p-value* 0,001(p< 0,05) dan *effect size* -1,00. Hal ini mempunyai arti bahwa terdapat pengaruh edukasi dengan pemodelan Piring T terhadap pengetahuan diit obesitas sebelum dan sesudah intervensi.

A. INTRODUCTION

Obesity is a pathological condition caused by the accumulation of fat in several parts of the body and is one of the main risk factors for non-communicable diseases, such as cardiovascular disease, diabetes mellitus, and the leading cause of death and disability in 2019 (Vos et al., 2020; WHO, 2022)Globally, WHO estimates that 800 million people are currently living with obesity, 39 million of whom are children under 5 years old (2020), and 340 million are children and adolescents aged between 5 and 19 years. Moreover, there are at least 1 billion more people at risk of being overweight or obese. (Masood & Moorthy, 2023). Therefore, according to the WHO, obesity is a global health problem that has been declared a global epidemic and requires immediate treatment. (Mutiara et al., 2017).

In Indonesia, a lower-middle-income country with a population of over 273 million, the burden of obesity is increasing. The 2023 Indonesian Health Survey report showed that 23.4% of the adult population in Indonesia is obese. (Kemenkes R1, 2023). This figure is an increase compared to 2013 and 2018, which were 14.8% and 21.8%, respectively. Jakarta, in particular, ranks second with 42% of the population aged 15 years and older experiencing central obesity. The prevalence of obesity tends to be higher among adolescent girls than boys, at 1.5% for women and 1.3% for men. (Balitbangkes, 2019). According to behavioral theory, obesity is caused by the eating behavior of obese individuals, who are more responsive to external cues (such as time, food appearance, food taste, and various food characteristics) than to internal cues (eating due to hunger or satisfaction) (Salih Sahib et al., 2016)

Among various eating behaviors, high-calorie food intake is considered a cause of weight gain, overweight, and obesity, especially if large portions are consumed regularly. A diet rich in fat, snacking, and fast eating is associated with an increased prevalence of obesity. A study (Prabu Aji et al., 2022)Found that oil and fat consumption, as well as a lack of vegetable consumption, are positively correlated with a person's excess weight. Therefore, a person's eating habits or lifestyle play an important role in developing obesity(E. S. Kim et al., 2018; Mutia et al., 2022)

Adults are a nutritionally vulnerable group due to changes in diet and lifestyle, risk-taking behavior, and susceptibility to environmental influences. The poorer the quality of a person's diet and eating behavior, the greater the risk of obesity (Fadlina et al., 2023)Effectively addressing obesity requires dietary management, controlling excess nutrient intake, and concretely teaching them how to choose the right foods and achieve a healthy diet (B. R. Kim et al., 2017) Maintaining an ideal weight after weight control requires weight monitoring and overall lifestyle improvements (Palupi et al., 2022). Furthermore, this is also in line with the GENTAS (Nusantara Movement to Reduce Obesity) Program, which recommends the use of T-shaped dinner plates as part of its efforts to reduce obesity prevalence. T-shaped dinner plates have a low energy density because they increase vegetable intake, thereby directly reducing energy intake (Nugroho, 2021)

Nutrition education using a T-shaped dinner plate, along with nutritional support and weight control, is one strategy that can be implemented to increase a person's knowledge

about healthy eating patterns, especially regulating the quantity and quality of food consumed(Angelina Muhtarini Cahyaningtyas et al., 2023). It also has the potential to increase a person's knowledge, which in turn is expected to bring positive changes in attitudes and behavior. (Mumtaz, 2023). The T-shaped dinner plate media can visualize real-life scenarios and make the learning experience more engaging. It also provides visual cues or tools as reference points that indicate the appropriate portion size or energy/calorie content of food. This makes educational content regarding eating management for someone with obesity very suitable for nutrition education interventions. Therefore, the use of the T-shaped dinner plate educational media is expected to increase knowledge and support efforts to regulate proper eating patterns in mothers with obesity.

B. METHODS

This study used a quasi-experimental approach with a one-group pretest-posttest. This design attempts to reveal a causal relationship without involving a control group in addition to the treatment group. The sampling method used purposive sampling with inclusion criteria in this study were mothers who were registered and weighed at the Posbindu regularly for three consecutive months, had an overweight nutritional obesity status based on a body mass index (BMI) of 25-27 kg/m2, were willing to participate in the activity from start to finish, and took the pre-post test. The exclusion criteria were not participating in the intervention activity, as evidenced by the attendance list, and not taking the post-test. This study only used one group, namely the group that received the T-model plate media treatment, counseling, and mentoring. This study was conducted in RW 04, 05, 06, Harapan Mulya Village, Kemayoran District, Central Jakarta. The initial survey for selecting this location was RW 04, 05, 06 because these three RWs already had Primary Service Integration, where there was a Posbindu PTM in it, so that it was expected to facilitate the process of mentoring and nutritional education intervention.

The research process began with a pre-test. Treatment included direct counseling using PowerPoint presentations, nutrition education using a T-plate model, distribution of the 2021 Ministry of Health weight card leaflet containing obesity management and a weight monitoring card, and mentoring via WhatsApp group chat and Google Meet twice a week on Wednesdays and Saturdays with a 40-minute question-and-answer session for one month. A post-test was then conducted using questions that had undergone content validation.

The main outcomes of this study included respondent characteristics and maternal knowledge regarding obesity diet management using the T-plate model. Maternal knowledge was measured using an obesity diet management knowledge questionnaire administered before and after the educational intervention. All collected data were processed using Jamovi 2.3.28 and statistically analyzed using the Wilcoxon test with a significance level of <0.05 due to the categorical nature of the data. Interpretation of statistical test results if the p-value <0.05 then there is a difference in the average knowledge of mothers regarding obesity diets before and after being given education with T-plate modeling and vice versa if the p-value >0.05 there is no difference in the average knowledge of mothers regarding obesity diets both before and after being given education with T-plate modeling. Ethical approval has been obtained from the Health Research Ethics Committee of the Indonesian STRADA Institute of Health Sciences with number

001210/EC/KEPK/I/04/2024. All respondents are willing to sign the consent form after understanding the provisions and objectives of the study.

C. RESULT AND DISCUSSION

1. Result

a. Respondent Characteristics

Eighteen (18) mothers who met the inclusion criteria participated in this study. The majority of respondents were aged 41-45 years (37.5%), Sundanese (58.1%), had a high school education (80%), and were housewives (83.7%). Detailed respondent characteristics are described in Table 1.

Table 1. Respondent Characteristics

Variable	Category	N(%)
Age	25-30 years	5 (31.3)
	31-35 years	3 (18.8)
	36-40 years	2(12.5)
	41-45 years	6(37.5)
Ethnic	Sundanese	8 (58.1)
	Javanese	4 (30.2)
	Betawinese	4(11.6)
Education Background	No school	1 (6.3)
	Elementary school	3(18.8)
	Junior High School	4 (25)
	Senior High School	8(50)
Employment status	Housewife	10 (83.7)
	Freelancer	5(11.6)
	Merchant	1(4.7)

Based on the responses of each respondent, their knowledge was categorized into two categories: poor (score ≤11) and good (score 12-18). The results of their knowledge levels regarding obesity diet are presented in the following Table 2.

Table 2. Distribution of respondents regarding obesity diet knowledge (N=18)

Knowledge	Pretest		Post test	
	n	%	n	%
Good	10	55.6	17	94.4
Less	8	44.4	1	5.6
Total	18	100	18	100

Based on Table 2, it can be seen that the respondents' knowledge categories regarding obesity diets in the pre-test were mostly in the good category, with 10 respondents, and less good with 8 respondents, while for the post-test, most were in the good knowledge category with 17 respondents and less knowledge category with one respondent.

b. Bivariate Analysis

The Effect of T-Plate Modeling Education on Obesity Diet Knowledge

Table 3. Effect of T-Plate Modeling Education on Mothers' Knowledge of Obesity Diet (N=18)

Variable	Mean±SD	z	*p-value*	*Effect size*
Knowledge				
Pre-test	11,44±1,72	2,12	0,001*	-1,00
Post-test	13,56±1,38			

Ket: * Wilcoxon test (p<0,05)

The analysis results using the Wilcoxon test obtained an average increase in knowledge before and after the intervention of 2.12 points with a p-value of 0.001 and an effect size of -1.00. This means that there is an effect of providing nutritional media (T-shaped plates), nutritional counseling, and assistance on increasing respondents' knowledge about obesity diet.

2. Discussion

The results of the study indicate that there is an effect of providing nutritional media (T-shaped plates), nutritional counseling, and assistance on increasing respondents' knowledge. This is indicated by an increase in the post-test score of 2.12 points. The results of this study are similar to those conducted by Nugroho (2021), which showed a change in the average post-test score with the treatment of providing nutrition education using the group discussion method, namely from 10.72 to 16.25, with a p-value = 0.001. The use of good media will directly stimulate the use of the five senses, thereby increasing the enthusiasm of respondents. In this study, the T-shaped plate was packaged in its actual form, namely a plate with a three-part model resembling the letter T, with attractive colors so that it is not plain white like plates in general. In addition, socialization of how to use it was carried out and assistance via WhatsApp group, with the hope that respondents would be more understanding and comfortable in learning matters related to the T-shaped plate in preventing obesity incidents related to reducing intake by limiting the density of food consumed.

Direct health promotion can have a positive impact on changing people's behaviors to be healthier. Direct interventions such as training, community outreach, practice, or

individual counseling allow for more effective two-way communication (Mutiara et al., 2017). Thus, health workers or health promoters can provide information more tailored to individual needs, answer specific questions, and provide stronger encouragement to adopt a healthier lifestyle (Mumtaz, 2023). Therefore, in this study, direct education, leaflets, and Google Meetings were able to increase respondents' knowledge, as evidenced by an increase in the average score.

Monitoring and mentoring in this study were conducted through a dedicated WhatsApp group, particularly in determining the quantity, frequency, and type of food to maintain nutritional status and control body weight. The diet implemented used a T-plate model, namely the amount of vegetables is twice as much as carbohydrate sources, the amount of protein sources is attempted to be equal to the amount of carbohydrates, and the amount of fruit consumed is at least equal to the amount of carbohydrates or protein. After being provided with education and direct practice, respondents received mentoring through a WhatsApp group. Health behavior can be changed through nutritional mentoring using methods appropriate to the conditions of the times (WA group), including incorrect eating behavior (Kim et al., 2017). Media is positively related to increasing knowledge about nutrition; media that can be used include print media and/or social media. The use of social media (Instagram, Twitter, Facebook) is preferred because it is more easily accepted. Nutrition education through a combination of WhatsApp and Facebook media is quite effective in increasing knowledge mastery about obesity (Meilinda E.K & Choirul A.N, 2023; Naz et al., 2023)

D. CONCLUSION AND SUGGESTIONS

A nutrition intervention program by providing education using nutrition media (T-shaped plate), nutrition counseling, and mentoring (WA and Google Meeting) conducted on overweight mothers for 1 month showed an increase in knowledge with a post-test score of 2.12 points. Direct education using both PowerPoint media and nutrition media (T Plate), leaflets, and mentoring by combining WA and Google Meeting was able to provide a positive influence on behavioral changes, especially on eating behavior in the selection and use of T plates as one of the strategies for controlling eating in overweight mothers. It is hoped that the results of this study will be one of the strategies for nurses or health promoters in conducting health promotion based on the use of nutrition media (T plates) and combining social media (WA and Google Meeting) so that education does not always have to be done face-to-face or offline but can be more flexible and innovative.

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