

THE INFLUENCE OF THE NUTRITION PARTNERS NETWORKING MODEL TO KNOWLEDGE AND SKILLS IN IMPLEMENTATION OF 4 PILLAR NUTRITIONAL BALANCED AND EFFECT ON UPPER ARM CIRCUMFERENCE AND ABDOMINAL CIRCUMFERENCE IN YOUNG GIRLS

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Purpose: This study aims to increase the knowledge and skills of young women in implementing the 4 pillars of balanced nutrition so that it is expected to have an impact on the size of the upper arm circumference (LILA) and abdominal circumference (LIPE).

Methodology: The sample in this study amounted to 151 people with details of 111 people in the intervention group consisting of young women with an average age of 15-17 years, class X SMAN 3 Palangka Raya and 40 people in the control group (SMAN 4 Palangka Raya). The research design was one group pre and post test with control group design.

Findings: Based on the results of the study, it was found that the number of nutrition partner networks increased by 71 people consisting of 15 people in GS¹, 24 people in GS², 17 people in GS³ and 15 people in GS⁴. Non-parametric analysis of knowledge and skills data showed that there was a significant difference in the increase in knowledge and skills in the intervention group compared to the control group. This increase still had no impact on the results of measurements of upper arm circumference (LILA) and abdominal circumference of young women (LIPE). The effectiveness of the nutrition partner network model was tested with N-Gain with quite effective results reaching 39.6%.

Limitation: Limitation of this study is controlling activity for leader of the research group that how they make motivation for nutrition partners could invite more the others and join to group.

Contribution: SMAN 3 Palangkaraya and SMAN 4 Palangkaraya have more contribution for this research and thank you.

Keywords: *Nutrition partners, 4 pillars balanced nutrition, teneeger.*

1. Introduction

Regulation of the Minister of Health Number 25 of 2014 states that the age range of adolescents ranges from 10-18 years. (Ministry of Health, 2015). Adolescence is the age range during the transition from childhood to adulthood. Many changes occurred during this time, such as physical, emotional and psychological changes (Ramauli and Vindari, 2011 in Rofi'ah, 2017).

Adolescence is referred to as a period of dramatic change, rapid growth accompanied by hormonal, cognitive and emotional changes so that at this time special nutrients are needed (Istiany, 2013). Referring to various recent data on the problems being faced by adolescents, especially nutritional problems such as iron deficiency anemia and chronic energy deficiency (KEK) and the incidence of central obesity. The epidemiology of nutritional problems for young women is illustrated by the rate of iron deficiency anemia in adolescents reaching 22.7% (Risksedas, 2013), women of childbearing age 15-19 years with CED reaching 36.3%. Meanwhile, the central obesity rate in adolescents (age > 15 years) reaches 31% (Risksedas, 2018) almost double when compared to the central obesity rate in 2007 (18.8%). Several studies state that the incidence of central obesity is more common in female adolescents than male adolescents (Kusteviani, 2015). Likewise, the prevalence of adolescents who experience anemia and chronic lack of energy is more common in female adolescents.

Diverse diet patterns, lack of physical activity and exercise, unhealthy lifestyles that are not maintained are factors that are often mentioned as the cause of nutritional problems in adolescents, especially central obesity (Putri, et al, 2017). In addition, there is a lack of information related to nutritional problems in adolescents and a change in mindset from 4 healthy 5 perfect to a nutritional mindset which until now is still poorly understood by the public, especially teenagers.

Prevention of nutritional problems in adolescents can be done by disseminating information related to factors related to these events. The more women who know and care about this information, the incidence of central obesity, chronic energy deficiency and nutritional anemia in young women can be prevented and their prevalence reduced. So that it is very necessary to understand and apply the 4 pillars of balanced nutrition among young women, especially including consuming a variety of foods, doing physical activity and exercising regularly, having a healthy lifestyle and always monitoring body weight.

This study aims to provide a solution for disseminating information and understanding the application of the 4 pillars of balanced nutrition packaged in a nutrition partner network model. Young women as agents of change will serve as nutritional partners. The utilization of young women in this research activity is based on the results of research on the effectiveness of peer groups in increasing knowledge and changing adolescent behavior. Knowledge can be increased by the process of learning in groups with peers (peer groups). Education conducted by peer groups (peer education) is a process of communicating, informing and providing education (IEC) by and for groups/peers by emphasizing behavior change (Rofi 'ah, et al, 2017). With the hope that there will be interaction within the group. A person will feel similarities with others, so that they can develop a social sense in accordance with personality development. This method will be applied in this study, but with a different model. The difference lies on the delivery model that refers to communication in groups with whatsapp media. Information on the application of the 4 pillars of balanced nutrition will be packaged in a simple form with the help of the WhatsApp application media so that it is easy to understand and apply among young women.

2. Literature Reviews And Hypotheses Development

Adolescence is the age range during the transition from childhood to adulthood. Many changes occurred during this time, such as physical, emotional and psychological changes (Ramauli and Vindari, 2011 in Rofi'ah, 2017). Adolescence is referred to as a period of dramatic change, rapid growth accompanied by hormonal, cognitive and emotional changes so that at this time special nutrients are needed (Istiany, 2013).

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3. Research Methodology

This research is a quasi-experimental study with a one group pre post test design. The research location was in SMAN 3 Palangka Raya City, with a total sample of 111 people. At the beginning of the study, 40 students in grade X were given nutrition education with the theme of implementing the 4 pillars of balanced nutrition in adolescents, then they were divided into 4 (GS) groups, 10 people each group and consisting of leaders, admins and members. The research lasted for approximately 1 month (21 working days to be exact from October to November 2019). Every day in each group, the leader creates and conveys nutritional messages through WhatsApp media so that the members respond directly. Admin plays a role in managing the group and increasing the number of members. Over the course of the study, the number of members in the balanced nutrition group grew. The development of the number of group members can be seen in Figure 1.

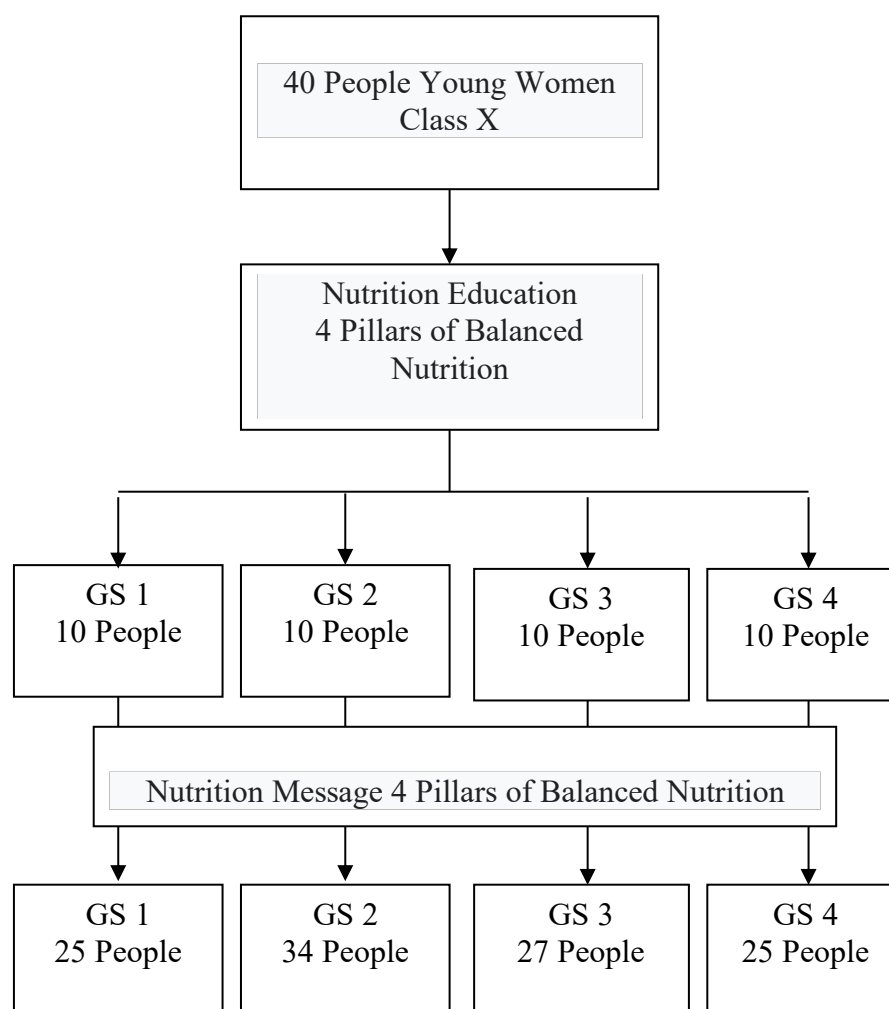


Figure 1. Nutrition Partners Research Flow and the development of the Number of Members

The tools in this study were a knowledge questionnaire and a skills questionnaire which contained issues relating to the application of the 4 pillars of balanced nutrition. Based on the results of the validity test and the reliability test of the questionnaire, the corrected item-total correlation value was 0.996 ($> r$ table 0.514) and Cronbach's alpha was 0.851. Other tools are LILA tape with an accuracy of 0.1 cm and a cloth meter with an accuracy of 0.1 cm.

Analysis of the normality of the data was carried out using the Kolmogorov-Smirnov one sample test so that it is known that the Upper Arm Circumference data (LILA) and Abdominal Circumference data (LIPE) are normally distributed with a significance of 0.200 and 0.200 respectively (p value > 0.05). While the knowledge score data and skill scores obtained a

significance of 0.019 and 0.000 respectively (p value <0.05) so it was concluded that the data were not normally distributed. The categorization of knowledge data refers to the average knowledge score – 1 Standard Deviation, namely 50 (cut off: $M-1SD$) while the categorization of skills data is based on the percentage of skill scores (cut off 70% of the total score).

The analysis was carried out using univariate and bivariate research variables. To find out the effect of education and delivery of information on knowledge and skills, a paired t test was carried out in each Balanced Nutrition group. Meanwhile, the effect of the nutrition partner network model on knowledge and skills was tested using the Chi-Square test (non-parametric test), while the LILA and LIPE data were tested with an analysis of variance (one way ANOVA) in the SPSS program

4. Results and Discussion

This research began by advocating for several schools in order to determine the location of the research. The selection of SMAN 3 Palangka Raya as the research location was based on distance traveled, the school's hospitality, as well as the results of observations of overweight students. The researcher met directly with the deputy head of the school in the field of curriculum because it was related to setting a research schedule. Determination of the sample was carried out by the school with inclusion criteria: Class X students, have an Android cellphone, have the WA application, are willing to be respondents. The distribution of nutrition partner networks can be seen in Table 1.

Table 1. Nutrition Partner Network Distribution Based on School of Origin

Asal Sekolah	GS4	GS3	GS2	GS1
SMAN 3	20	24	34	21
SMK 3	1			2
MA Darul Ulum	1	3		
SMAN 1	1			
SMK 2	2			
SMAN 4				2
Total	25	27	34	25

Nutrition education is provided in the school hall with a capacity of 150 people. The media used is LCD and the material is packaged in the form of Power Point. Providing nutrition education is an effort to equalize the initial conditions of the research. Before the activity started, a pretest was carried out on 40 class X students who were willing to become samples and measurements were taken for upper arm circumference (LILA) and abdominal circumference (LIPE). Each student is part of the WhatsApp group for balanced nutrition (GS),

and every day the students receive additional information in the form of nutritional messages created and delivered by each leader. Recruitment of additional members is carried out after the GS group is started. Post test and re-measurement were carried out after 21 days of running the nutrition partner network. The frequency distribution of pre and post data can be seen in Table 2.

Table 2. Analisis Pair T Test

<i>Pair</i>	N	<i>95% confidence interval</i>		<i>Sig. (two tail)</i>
Knowledge initial score and knowledge final score	40	-19.976	-12.224	0.000
Knowledge initial score and knowledge final score	40	-4.656	-2.744	0.000
Initial arm circumference final arm circumference	40	-0.194	0.404	0.482
LIPE beginning-LIPE end	40	-1.314	0.064	0.074

Based on the results of the paired t test analysis, it is known that there is a significant difference between the initial score of knowledge and the final score of knowledge with a significance of 0.000. Likewise, there is a significant difference between the initial score of skills and the final score of skills (p value <0.05). According to Thasim, et al (2013), nutrition education can increase respondents' nutritional knowledge before and after education.

The frequency distribution of research variables after undergoing communication in the Balanced Nutrition group can be seen in the following Pie Diagram.

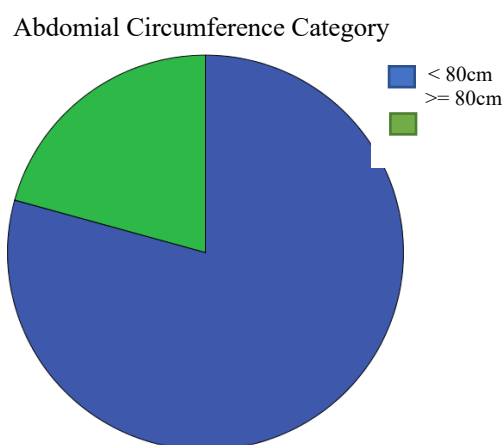


Figure 2. LIPE Category Frequency Distribution

More than 70% of young women still have very good belly circumference. This shows that young women are still very active and diligent in exercising. Abdominal circumference is closely related to body image and can increase the self-confidence of young women (Ifdil,

et al, 2017). However, the figure of 20.7% of young girls with abdominal circumference > 80 should be watched out for and needs attention from the school. This is because this condition carries a risk of contracting non-communicable diseases such as diabetes mellitus (DM), hypertension, heart disease, gout, high cholesterol, and others.

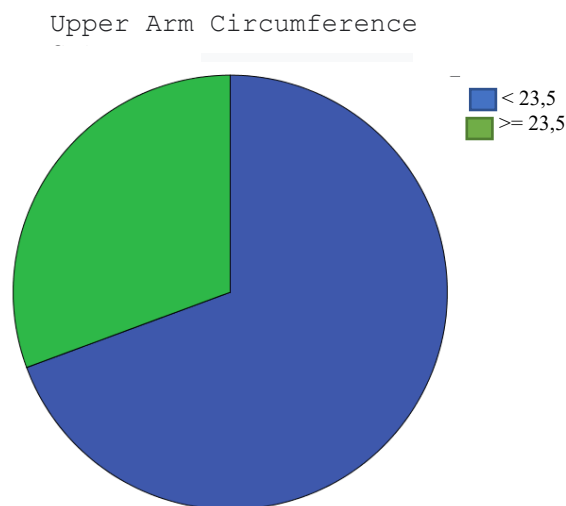


Figure 3. LILA Category Frequency Distribution

Upper arm circumference or abbreviated LILA is an indicator of chronic energy deficiency (CED). The relatively high number of young women who have LILA above > 23.5, which is around 69.4%, will correlate with the incidence of adolescent overweight and obesity (Kumesan, et al, 2016).

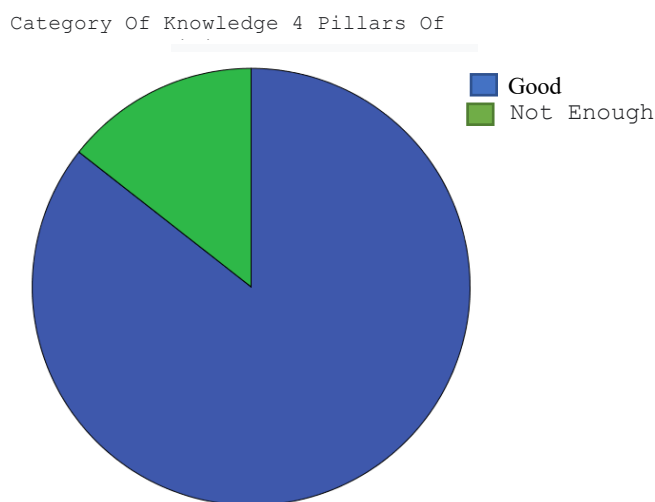


Figure 4. Frequency Distribution of Knowledge Categories

Skill Category 4 Pillars Of Balanced

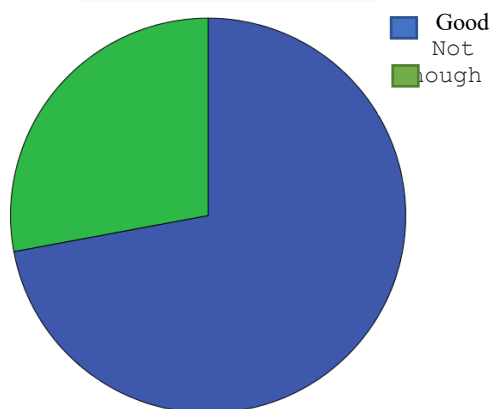


Figure 5. Frequency Distribution of Skill Categories

The results of the bivariate analysis that tested whether there was an influence of the nutrition partner network model on knowledge, skills, upper arm circumference and abdominal circumference can be seen in Table 3 and Table 4 below.

Table 3. Chi-Square Analysis of Knowledge and Skill Data

	Balanced Nutrition Knowledge	Skills related to the application of the 4 pillars of balanced nutrition
Chi-Square	131.550 ^a	65.757 ^b
df	18	19
Asymp. Sig.	0.000	0.000

Table 4. Analysis of Variance Data LILA and LIPE

Variabel	df	F	Sig.
LILA	3	1.095	0.354
LIPE	3	0.392	0.759

Empowering young women as a network of nutrition partners is an effort that can be made to disseminate information and increase understanding in implementing the 4 pillars of balanced nutrition in their daily lives. The average increase in knowledge of young women who are exposed to nutrition partner networks is 16.1 points. The biggest knowledge change reached 50 points in the GS3 group. While the change towards increasing skills reached 10 points, namely in the GS1 group. This is related to the nutritional message conveyed by the

leader and discussions between peers in the WhatsApp group. Sukrillah, et al (2017) explained that apart from functioning to convey information, the WhatsApp Group also functions as a media for discussion and education, as entertainment media, as well as a medium to exert influence. The role of the nutrition partner network can be seen in Table 1. The more SMA/SMK/MA that join the wa group, the wider the information dissemination will be.

This nutrition partner network model can increase the knowledge and skills of young women in implementing the 4 pillars of balanced nutrition. Table 3 proves that there are significant differences in the categories of knowledge and skills categories after participating in communication, information and education in the balanced nutrition group media.

Based on the results of the analysis of the answers to each knowledge question posed in the questionnaire, it is known that almost all of them know the paradigm shift from 4 healthy 5 perfect to Balanced Nutrition (97.5%). Eighty (80%) are familiar with healthy eating guidelines through the "Fill My Plate" method. But I still don't know the portion of food on my plate. Likewise with the upper arm circumference measurement function, the average does not know (< 50%).

Intense communication within the group and the existence of nutritional messages that are shared every day serve as a reminder for peers as well as an educational medium to increase knowledge. The increase in skills shown by young women in this study is inseparable from theories of behavior change such as the S-O-R theory. The existence of a stimulus in the form of a nutrition message delivered accompanied by other media which is shared in the group can be a trigger for a change in attitude which in turn increases individual skills in implementing the 4 pillars of balanced nutrition.

However, this does not necessarily have the same effect on the results of measurements of the upper arm circumference and abdominal circumference of young women.

5. Conclusion

Based on the results of the research that has been done several conclusions can be drawn, 1) there is an influence of the nutrition partner network model on nutritional knowledge of young women; 2) there is an influence of the nutrition partner network model on the skills of young women; 3) there is no effect of the nutrition partner network model on female adolescent upper arm circumference; and 4) there is no effect of the nutrition partner network model on female adolescent abdominal circumference.

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