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The Effect of Flip Sheet Media on Knowledge of Dysmenorrhea, Calcium Intake, Eating Pattern, and Nutritional Status of Female Adolescents

Lidia Dwi Lestari¹✉, Didik Hariyadi¹, Dahliansyah¹

¹ Department of Nutrition, Politeknik Kesehatan Kementerian Kesehatan Pontianak, Pontianak, West Kalimantan, Indonesia

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Adolescents experience rapid growth, and dysmenorrhea can interfere with activities and concentration in studying. The WHO recorded in 2017 that 90% of female adolescents experience dysmenorrhea, with 10–16% experiencing severe dysmenorrhea. The incidence rate in Indonesia is also relatively high. One of the effective nutrition education media to address dysmenorrhea related to eating patterns is the flip sheet, as it can convey information visually and gradually. This study aims to analyze the effect of flip sheet media on the knowledge of dysmenorrhea, calcium intake, eating pattern, and nutritional status of female adolescents in Limbung Village, Sungai Raya Subdistrict. This study is a pre-experimental research with a pre-and-posttest group design. The research subjects are female adolescents from Limbung Village, Sungai Raya Subdistrict. A sample of 35 respondents was taken using purposive sampling. Based on the research results, there was no significant increase in the variables of knowledge, eating patterns, and nutritional status before and after receiving nutrition education, with a p-value >0.05, but there was a significant increase in the calcium intake variable before and after receiving nutrition education, with a p-value <0.05. There is an effect of flip sheet media on the knowledge of dysmenorrhea, calcium intake, eating pattern, and nutritional status.

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Corresponding Author:

✉ Lidia Dwi Lestari

Department of Nutrition, Politeknik Kesehatan Kementerian Kesehatan Pontianak, Pontianak, West Kalimantan, Indonesia

Email: liadiawilestar3@gmail.com

1. INTRODUCTION

Dysmenorrhea is a common menstrual disorder that often occurs in female adolescents (Rustam, 2015). Dysmenorrhea is characterized by nausea, vomiting, diarrhea, headaches, fatigue, or mood changes. Factors that influence the occurrence of dysmenorrhea include age, prostaglandins, anemia, stress, menstruation, and physical activity (Sari, Kartasurya, & Pangestuti, 2018). Dysmenorrhea is a debilitating condition for many female adolescents and has a significant impact on quality of life in relation to health (Larasati, & Alatas, 2016). Dysmenorrhea prevents female adolescents from engaging in normal activities. For example, students who experience primary dysmenorrhea are unable to concentrate on studying and have reduced motivation to learn due to the pain they experience (Larasati, & Alatas, 2016). Many nutrients are related to dysmenorrhea, such as calcium, magnesium, zinc, vitamin E, and omega-3 fatty acids. Calcium works on muscle contractions, making this nutrient play a role in reducing menstrual pain (Wahyuni, Fasya & Novianti, 2021).

The incidence of dysmenorrhea was 1,769,425 (90%) among female adolescents who experienced dysmenorrhea, with 10-16% experiencing severe dysmenorrhea. The global incidence of dysmenorrhea is very high, with nearly 50% of female adolescents experiencing it. The incidence of dysmenorrhea in Indonesia is also not low compared to other countries worldwide (Syafriani, Aprilla & Zurrahmi, 2021). The incidence of dysmenorrhea in Indonesia includes 72.89% primary dysmenorrhea and 21.11% secondary dysmenorrhea. The incidence of menstrual pain in Indonesia is estimated to affect 55% of women of reproductive age. The prevalence of menstrual pain in women of reproductive age ranges from 45-95% (Marlinda & Purwaningsih, 2013). Micronutrient deficiencies (vitamins and minerals) stimulate an excess of prostaglandins, which facilitate the onset of menstrual abdominal pain observed before or during menstruation, often referred to as dysmenorrhea (Savitri, Citrawathi, & Dewi, 2019). To reduce menstrual pain, one of the micronutrients is calcium. Calcium plays a role in the interaction between muscle proteins, particularly actin and myosin, in muscle contraction (Aprilianti & Ghia, 2020). The Recommended Nutrient Intake for calcium requirements in adolescents aged 12-18 years is 1200 mg/day, and for those aged 19-21 years is 1000 mg/day (Kementerian Kesehatan Republik Indonesia, 2019). Kalsium merupakan mineral yang paling melimpah di dalam tubuh (Shita & Sulistiyani 2010). The function of calcium in dysmenorrhea is to prevent menstrual pain in the lower abdomen, so it is recommended to consume calcium-rich foods.

Calcium requirements are met when we consume a balanced diet every day (Trisianti & Setiyaningrum 2021). Several studies examining the role of nutrients in the occurrence of dysmenorrhea have shown significant differences in calcium, magnesium, and physical activity between the dysmenorrhea and non-dysmenorrhea groups, while no difference was found in zinc intake between the dysmenorrhea and non-dysmenorrhea groups (Wahyuni, Fasya & Novianti, 2021). The results of a study conducted on 62 female adolescents at the Health Polytechnic of the Ministry of Health, Palangkaraya in 2019 concluded that there is a relationship between calcium intake and menarche age, as well as stress levels and dysmenorrhea (Aprilianti & Ghia, 2020). Memang terdapat hubungan antara asupan kalsium dengan tingkat nyeri haid pada remaja putri dan hubungan yang cukup antara asupan kalsium dengan angka nyeri haid (Trisianti & Setiyaningrum, 2021).

An eating pattern is the composition of the types and amounts of food consumed by an individual or a group of people at a specific time. Many female adolescents often follow strict diets (which leads them to not get a balanced and nutritious diet) (Muchlisa, &

Indriasari, 2013). Incorrect behavior in food selection and lifestyle requires nutrition education as a learning medium. One of the nutrition education media that can be used is flip sheet media as a step to address dysmenorrhea related to diet. The benefit of flip sheets is to make it easier to provide information with step-by-step images. Flip sheets are a popular media in the health field (Sastrawan & Bahrudin, 2021). Each phase has numbered images, and once completed, the image pages repeat and continue until the end. The advantage of flip sheets is that the clear images appear together, making them engaging and easy to understand (Sutriani, Alwi & Asrina, 2021). This study aims to analyze the effect of flip sheet media on the knowledge of dysmenorrhea, calcium intake, eating pattern, and nutritional status of female adolescents in Limbung Village, Sungai Raya Subdistrict.

2. METHOD

This research is a pre-experimental study that uses the design employed by the Pre and Post-test Design group. This method involves conducting a pre-treatment test first, with the treatment's effect being more accurately determined by comparing the conditions before and after the treatment. The population of this study consists of female adolescents aged 11-19 years. The sample for the study was selected using purposive sampling, with a total of 35 respondents.

The data used in this research includes primary data, which is collected directly from the study, and secondary data, which includes a description of the research location and general information about the respondents. The data that has been gathered will be analyzed using univariate and bivariate analysis, and the results will be presented in the form of tables and text.

3. RESULTS AND DISCUSSION

Table 1. Frequency Distribution of Respondents' Age

Age	n	%
12	2	5.7
13	2	5.7
14	5	14.3
15	6	17.1
16	5	14.3
17	1	2.9
18	1	2.9
19	13	37.1
Total	35	100

Table 1 shows that the age range of the respondents in this study is between 12 and 19 years. The most frequent age group is 19 years, with 13 individuals (37.1%). Meanwhile, the least frequent ages are 17 and 18 years, each with 1 individual (2.9%).

Table 2. Wilcoxon Test Results of Knowledge Before and After Nutrition Education in Respondents

Knowledge	Before	After	Improvement
Mean	72.57	75.14	2.57
Minimum	40	50	10
Maximum	100	100	0
Std. Dev.	14.005	13.144	0.861
p-value	0.300		

Table 2 shows that the average knowledge of respondents improved before and after receiving nutrition education in the form of counseling. The average score of correct answers before the nutrition education was 72.57, and after the education, it increased to 75.14, with a total improvement of 2.57. The Wilcoxon test results yielded a p-value of 0.300, indicating that the increase was not statistically significant before and after the nutrition education.

Table 3. Wilcoxon Test Results of Calcium Intake Before and After Nutrition Education in Respondents

Calcium Intake	Before	After	Improvement
Mean	109.089	96.42	-12.669
Minimum	14.3	5	-9.3
Maximum	396	810	414
Std. Dev.	91.2350	137.134	45.899
p-value	0.041		

Table 3 shows that the average calcium intake of respondents decreased before and after receiving nutrition education in the form of counseling. The average calcium intake before the nutrition education was 109.089, and after the education, it dropped to 96.42, with a total decrease of 12.669. The Wilcoxon test results yielded a p-value of 0.041, indicating that the decrease was statistically significant before and after the nutrition education.

Table 4. Wilcoxon Test Results of Eating Behavior Before and After Nutrition Education in Respondents

Eating Behavior	Before	After	Improvement
Mean	2.29	2.14	-0.15
Minimum	1	1	-2
Maximum	4	4	0
Std. Dev.	1.100	1.115	0.015
p-value	0.394		

Table 4 shows that the average eating behavior of respondents decreased before and after receiving nutrition education in the form of counseling. The average eating behavior score before the education was 2.29, and after the education, it decreased to 2.14, with a total decrease of 0.15. The Wilcoxon test results yielded a p-value of 0.394, indicating that the decrease was not statistically significant before and after the nutrition education.

Table 5. Wilcoxon Test Results of Nutritional Status Before and After Nutrition Education in Respondents

Nutritional Status	Before	After	Improvement
Mean	26.17	26.17	0
Minimum	21	21	0
Maximum	37	37	0
Std. Dev.	2.918	2.918	0
p-value	1.0		

Table 5 shows that there was no change in the average nutritional status of respondents before and after receiving nutrition education in the form of counseling. Both the pre- and post-education average nutritional status scores were 26.17. The Wilcoxon

test results yielded a p-value of 1.0, indicating that there was no significant change in nutritional status before and after the nutrition education

DISCUSSION

Based on the statistical analysis results of the knowledge scores before and after the nutrition education using the Flip Sheet Media, the average knowledge score before the nutrition education (pre-test) was 72.57, and after the nutrition education (post-test), it was 75.14. The difference in the average knowledge score of adolescent girls in Limbung Village, Sungai Raya District, was 2.57. The knowledge scores before and after the nutrition education using Flip Sheet Media were then analyzed using the Wilcoxon test. The Wilcoxon test results showed a significant value of $p = 0.300 (> 0.05)$, which means there was no significant effect on the knowledge scores of adolescent girls in Limbung Village, Sungai Raya District, before and after the nutrition education. The lack of impact on the knowledge scores was due to the fact that some of the post-education scores were higher than the pre-education scores. This research is in line with the study Karuniadi & Widiastini, (2020) which states that there is no influence of providing communication, information, and education through WhatsApp on the knowledge of female adolescents.

Based on the statistical analysis results of calcium intake before and after the use of the Feedback Sheet media, the average calcium intake before nutrition education (pre-test) was 109.089, and after nutrition education (post-test), it was 96.42. The difference in the average calcium intake of female adolescents in Limbung Village, Sungai Raya District, was 12.669. The calcium intake before and after nutrition education using the Feedback Sheet media for female adolescents in Limbung Village, Sungai Raya District, was analyzed using the Wilcoxon test. The Wilcoxon test results showed a significant value of $p=0.041 (<0.05)$, which indicates an influence on the calcium intake of female adolescents in Limbung Village, Sungai Raya District, before and after receiving nutrition education. This study is in line with research Utami et al., (2018) Which states that there is a significant effect of the combination of calcium supplementation on the reduction of dysmenorrhea pain and the research Aprilianti & Ghia, (2020), which states that the variable influencing the occurrence of dysmenorrhea is calcium intake.

Based on the statistical analysis results of eating patterns before and after the use of the Feedback Sheet media, the average knowledge score before nutrition education (pre-test) was 2.29, and after nutrition education (post-test) it was 2.14. The difference in the average eating pattern of female adolescents in Limbung Village, Sungai Raya District, was 0.15. The eating patterns before and after nutrition education using the Feedback Sheet media for female adolescents in Limbung Village, Sungai Raya District, were analyzed using the Wilcoxon test. The Wilcoxon test results showed a significant value of $p=0.394 (>0.05)$, which means there is no effect on the eating patterns of female adolescents in Limbung Village, Sungai Raya District, before and after receiving nutrition education. The lack of effect on eating patterns is due to some individuals still having irregular eating habits, such as eating less than three times a day, not eating on time, rarely having breakfast, and seldom consuming fruits and vegetables. This study is in line with research Mufidah & Soeyono, (2021) which states that there is no significant effect of eating patterns on nutritional status.

Based on the statistical analysis results of nutritional status before and after the use of the Feedback Sheet media, the average nutritional status before nutrition education (pre-test) was 26.17, and after nutrition education (post-test), it was 26.17. The difference in the average nutritional status of female adolescents in Limbung Village, Sungai Raya District, was 0. The nutritional status before and after nutrition education using the Feedback Sheet media for female adolescents in Limbung Village, Sungai Raya District,

was analyzed using the Wilcoxon test. The Wilcoxon test results showed a significant value of $p=1.0$ (>0.05), which means there is no effect on the nutritional status of female adolescents in Limbung Village, Sungai Raya District, before and after receiving nutrition education. The lack of effect on nutritional status is due to ineffective timing, so the research was not maximally executed. This study is in line with research Yanti & Marlina, (2018) Which states that there is no significant effect of nutritional status on the occurrence of dysmenorrhea.

4. CONCLUSION

There is no effect of knowledge, eating patterns, and nutritional status of female adolescents before and after nutrition education in the treatment group with the provision of feedback sheet media. However, there is an effect of calcium intake before and after nutrition education in the treatment group with the provision of feedback sheet media.

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