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Innovative Educational Strategy: The Impact of an Animated Video on Estrogen Intake on Menopause Readiness

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ABSTRACT: Menopause is a physiological transitional phase that can cause both physical and psychological impacts on women. One promotive approach that has the potential to improve readiness in facing changes in reproductive function is health education through interactive media. This study aimed to examine the effect of health education about high-estrogen food intake using animated video on the readiness to accept reproductive function changes during menopause. This research employed an experimental design with two groups: an intervention group (n=22) and a control group (n=22), involving premenopausal women. The intervention was delivered in the form of an educational animated video about foods high in phytoestrogens. Readiness was measured using a structured questionnaire, and the data were analyzed using the Mann-Whitney test. The analysis showed a significant difference in post-test readiness scores between the intervention and control groups ($p = 0.006$). The mean score in the intervention group increased markedly from 53,7 to 59,5 while the control group only showed a slight increase from 54,3 to 54,7, which was not statistically significant. The higher mean rank in the intervention group also indicated a consistent improvement in readiness. Conclusion: Health education delivered through animated video is effective in increasing readiness to accept changes in reproductive function before menopause. This medium can serve as an attractive and easily understood promotive-preventive educational alternative.

1. INTRODUCTION

Menopause is a natural physiological phase in a woman's life that signifies the end of reproductive capability and is marked by a significant decline in estrogen levels. This transition is often accompanied by various biological and psychological changes that can affect women's overall well-being. However, many women lack adequate understanding of these changes, particularly concerning the role of estrogen and the importance of nutritional intake in supporting health before and during menopause.

Effective and innovative health education is crucial to ensure that information about menopause can be easily accessed and understood by women from diverse backgrounds. The use of visual media—such as animated videos—offers a promising approach to enhance health literacy and preparedness for menopause. Visual-based education is known to improve comprehension of complex medical topics, making it an engaging and effective learning medium (Ajari, 2020).

Previous research has demonstrated that technology-based educational media can improve understanding and retention of health information. Studies have shown that animated videos help explain complex medical concepts, including nutrition and hormonal balance. Nevertheless, limited research has specifically explored the impact of animated video interventions on knowledge about estrogen intake and women's preparedness for menopause. Most prior studies have relied on conventional counseling or printed materials, which often fail to reach a broad audience or to present content in an engaging format (Bahri et al., 2016).

Based on this background, the research problem is formulated as follows: To what extent can animated video-based health

education about estrogen intake improve women's readiness to face menopause?

This study aims to provide an innovative educational solution that combines scientifically grounded content with modern visual technology. It is expected that animated video media will deliver information in a more understandable, attractive, and impactful manner, thus enhancing knowledge, attitudes, and readiness for menopausal changes (Susilawangi et al., 2023).

Reproductive health encompasses a wide range of topics beyond pregnancy and childbirth, extending from menarche to menopause. Menopause typically occurs between the ages of 45 and 55, and is clinically defined as the cessation of menstruation for at least 12 consecutive months (Erol, 2014). During this period, women may experience physical symptoms such as irregular menstrual cycles, decreased libido, sleep disturbances, urinary tract problems, changes in body shape, hair loss, and dry skin (Zhang et al., 2020). These symptoms result primarily from the decline in estrogen and progesterone levels (Harahap et al., 2022).

One of the factors influencing the severity of these symptoms is the level of knowledge regarding estrogen-rich dietary intake, which plays a role in maintaining reproductive function and alleviating menopausal discomfort.

1.1 Problem Formulation

The physical and psychological symptoms experienced during menopause are often exacerbated by limited knowledge about high-estrogen nutritional intake. The novelty of this study lies in its focus on improving women's understanding of the relationship between high-estrogen foods and reproductive health during menopause, delivered through animated video-based health education.

1.2 Research Objectives

1.2.1 General Objective

To analyze the effect of health education about high-estrogen food intake through animated videos on women's readiness to accept reproductive changes during menopause.

1.2.2 Specific Objectives

1. To identify women's readiness to accept changes in reproductive function before receiving animated video-based education.
2. To identify women's readiness after receiving animated video-based education.
3. To analyze the effect of animated video-based health education on readiness to face changes in reproductive function during menopause.

Previous studies have shown various approaches to improving menopausal well-being, such as walking to reduce mood swings (Sydora et al., 2020), the husband's role in enhancing confidence (dos Santos Gonçalves et al., 2019), and the importance of social support in mental health (dos Santos Gonçalves et al., 2019). However, no study has directly examined the effect of knowledge—specifically about estrogen-rich food intake—on reproductive health readiness during menopause. This study fills that gap.

2. MATERIALS AND METHODS

2.1 Study Design and Participants

This research employed an experimental design with two groups: a treatment group and a control group. The population consisted of all premenopausal women in the Kebonsari sub-district, Surabaya. Using a total sampling technique, 44 respondents were included in the study.

2.2 Instruments and Procedure

The instruments used were:

1. Animated video media explaining high-estrogen food intake and its benefits for reproductive health.
2. A validated questionnaire assessing readiness to accept changes in reproductive function.

The study was conducted from April to June 2025, consisting of four health education sessions, each held 10 days apart. Each session lasted 60 minutes, comprising 40 minutes of video presentation and 20 minutes of discussion.

Respondents completed the questionnaire before (pre-test) and after (post-test) the educational intervention. The control group did not receive any health education.

2.3 Data Analysis

Data were analyzed using the Mann–Whitney test with a significance level of $\alpha = 0.05$ to determine the effect of the intervention on readiness to face menopausal changes

3. RESULTS AND DISCUSSION

3.1 Results

Table 1: Readiness to Accept Changes in Reproductive Function During Menopause Based on Category in Intervention and Control Groups

Variable	Category	Intervention		Control	
		Pre Test	Post Test	Pre Test	Post Test
Readiness to Accept	Good	2 (16.7%)	20 (83.3%)	4 (33.3%)	2 (16.7%)
	Sufficient	20 (83.3%)	2 (16.7%)	18 (66.7%)	20 (83.3%)
	Poor	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	Total	22 (100%)	22 (100%)	22 (100%)	22 (100%)

Table 2: Pre vs Post Comparison Test Table on Variables Readiness to Accept Changes in Reproductive Function During Menopause

Variabel	Kontrol	Perlakuan	Selisih Mean	P Value
	Post Test (Mean $\pm$ SD)	Post Test (Mean $\pm$ SD)		
Readiness to Accept	29,33 $\pm$ 0,82	33,83 $\pm$ 2,64	4,50	0,006

**Uji perbandingan Intervensi vs Kontrol menggunakan uji t test dan mann whitney dinyatakan berbeda jika nilai pvalue < 0.05

The statistical analysis showed a significant improvement in the treatment group's readiness to accept changes in reproductive function after the intervention. Pre-test (Treatment Group): 83.3% of respondents were in the "adequate" category, and 16.7% were in the "good" category. Post-test (Treatment Group): 83.3% shifted to the "good" category, and only 16.7% remained in the "adequate" category. In contrast, in the control group, no improvement was observed: Pre-test: 33.3% "good," 66.7% "adequate." Post-test: 16.7% "good," 83.3% "adequate." This pattern indicates a positive impact of the educational intervention using animated videos.

The mean readiness score in the control group after the post-test was 29.33 ± 0.82 , while in the treatment group it was 33.83 ± 2.64 . The mean difference between the groups was 4.50 points, with a p-value = 0.006 ($p < 0.05$), indicating a statistically significant effect.

3.2 Discussion

The results of the statistical test on the readiness to accept variable showed a significant change in the treatment group after receiving health education through an animated video about high-estrogen foods (Irawan et al., 2022).

In the treatment group, before the intervention (pre-test), the majority of respondents were in the adequate category (83.3%), and only 16.7% were in the good category. However, after the intervention (post-test), there was a significant improvement: 83.3% of respondents were in the good category, while only 16.7% remained in the adequate category. No respondents were in the poor category, either before or after the intervention.

Conversely, in the control group, which did not receive the intervention, no significant improvement was observed. Before the intervention, 33.3% of respondents were in the good category, while 66.7% were in the adequate category. After the observation period without intervention, the proportion of respondents in the good category actually decreased to 16.7%, while those in the adequate category increased to 83.3%. This indicates a decrease in readiness to accept changes in reproductive function in the control group.

The difference in trends between the two groups indicates that providing health education through animated videos has a positive impact on increasing women's preparedness for menopause. Increased knowledge about the importance of consuming foods high in estrogen is suspected to be the primary factor driving this change in perception and preparedness (Moshki et al., 2018).

With no respondents in the "poor" category in either group, the analysis focused on the shift between the "adequate" and "good" categories. These results reinforce the role of visual media-based education as an effective method for conveying reproductive health information in an engaging and easy-to-understand manner, especially for complex topics such as menopause.

Statistical tests revealed a significant difference between the control and treatment groups in terms of readiness to accept (readiness to accept changes in reproductive function) after the intervention (Rouhbakhsh et al., 2019).

The mean readiness to accept score in the control group after the post-test was 29.33 ± 0.82 , while in the treatment group it was 33.83 ± 2.64 . The mean difference between the two groups was 4.50 points, with a p-value of 0.006, which is statistically significant (since $p < 0.05$).

These results indicate that an intervention involving health education about estrogen-rich foods through animated videos had a significant positive impact on increasing women's preparedness for changes in reproductive function during menopause (Sagia, 2024).

The difference in standard deviation (SD) between the control group (0.82) and the treatment group (2.64) also indicates that, despite greater variation in understanding in the treatment group, the higher average score indicated the effectiveness of the educational method.

Therefore, it can be concluded that animated video-based health education is an effective strategy for increasing women's understanding and preparedness for menopause, particularly through knowledge about estrogen-rich nutritional intake relevant to their physiological needs.

4. CONCLUSION

This study aimed to examine the effect of health education about high-estrogen food intake delivered through animated video media on women's readiness to accept changes in reproductive function during menopause.

The findings revealed that the educational intervention using animated videos had a significant positive impact on increasing women's readiness to face menopause. After receiving the intervention, there was a notable improvement in the number of participants categorized as having a high level of readiness in the treatment group. In contrast, the control group, which did not receive any intervention, showed a decline in readiness. These results indicate that improved understanding of the importance of high-estrogen nutrition plays a crucial role in enhancing women's readiness for reproductive changes.

Overall, the study confirms that visual-based health education, such as animated videos, is an effective method for delivering reproductive health information. This medium helps simplify complex topics, making them more understandable, engaging, and memorable for participants.

For future research, it is recommended to expand the study to a broader population and larger sample size to enhance the generalizability of the results. Longer intervention periods and the exploration of other interactive educational media are also suggested. Additionally, incorporating other variables such as educational background, baseline knowledge, or social support may provide deeper insights into the factors influencing women's readiness for menopause.

5. RECOMMENDATIONS

Future studies should include larger and more diverse populations to enhance generalizability. Longer intervention periods and

the exploration of other interactive media (e.g., mobile applications or augmented reality) are also recommended. Additionally, considering variables such as education level, baseline knowledge, and social support may provide deeper insights into factors influencing menopausal readiness.

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