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Original Research

The Effect of Leaflet-Based Nutrition Education on Nutritional Knowledge and Understanding of Obesity Risk among Older Adults at *Posbindu* Telukjambe, Karawang Regency

Pengaruh Edukasi Gizi Berbasis Leaflet terhadap Pengetahuan Gizi dan Pemahaman Risiko Obesitas pada Lansia di Posbindu Telukjambe Kabupaten Karawang

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Abstract: *Obesity among older adults is a growing public health concern associated with an increased risk of non-communicable diseases, particularly due to low nutritional knowledge and nutritional literacy as well as unhealthy lifestyle behaviors. This study aimed to determine the effect of nutrition education leaflets related to obesity on the level of nutritional knowledge and nutritional literacy among older adults at Integrated Development Post for Non-Communicable Diseases Teluk Jambe, Karawang Regency. This research employed a quantitative approach with a pre-experimental one-group pretest–posttest design. The sample consisted of 31 older adults selected using total sampling. Data were collected using a structured questionnaire administered before and after the intervention. The intervention involved the distribution of nutrition education leaflets containing information on obesity, risk factors, health impacts, balanced nutrition, and physical activity recommendations. Data were analyzed using univariate analysis and the Wilcoxon Signed Rank Test due to non-normal data distribution. The pre-test results showed a mean knowledge score of 3.81 ± 1.642 with a median of 4.00 and a score range of 1–7. After the intervention, the post-test mean score increased to 6.00 ± 1.065 with a median of 6.00 and a score range of 4–8. The Wilcoxon test showed Z = -3.771 with Asymp. Sig. (2-tailed) = 0.000 (p<0.05), indicating a significant difference between knowledge scores before and after the leaflet intervention. These findings demonstrate that nutrition education leaflets are effective in improving nutritional knowledge and supporting nutritional literacy among older adults.*

Key word: Older adults, obesity, nutritional literacy, nutrition education, leaflet.

1. INTRODUCTION

Obesity among older adults is a growing public health problem in many countries, including Indonesia. The World Health Organization reports that the global prevalence of obesity in the elderly population has shown an increasing trend, in line with rising life expectancy and changes in lifestyle (38). In Indonesia, the 2023 Indonesian Health Survey indicated that the prevalence of obesity among adults exceeds 22%, with a significant proportion found in the elderly population (16). This condition increases the risk of non-communicable diseases such as type 2 diabetes mellitus, hypertension,

and coronary heart disease among older adults (13). Obesity in the elderly is influenced by various factors, including metabolic changes associated with aging, decreased physical activity, and increased sedentary behavior. National studies show that older adults with low levels of physical activity have a higher risk of obesity compared to those who are physically active (1). The decline in muscle mass and basal metabolic rate in later life also contributes to an increased body fat percentage, even when energy intake does not significantly increase (30).

Nutritional knowledge plays an important role in shaping healthy eating behavior. Older adults with low nutritional knowledge tend to consume foods high in fat, sugar, and salt, and have inadequate fiber intake (4). Nurhayati et al. (2023) stated that higher levels of nutritional knowledge are associated with better diet quality and improved weight control among adults and the elderly (22). Nutrition education is therefore an important approach in preventing obesity through information-based behavioral change. Printed educational media such as leaflets are practical and effective tools for health promotion. Leaflets are easy to read, can be stored, and allow individuals to revisit health information. Studies have shown that the use of leaflets can significantly improve nutritional knowledge scores among adults and the elderly. Printed materials tailored to the characteristics of older adults, such as large fonts, simple language, and visual illustrations, can enhance the understanding of health messages (7).

At the community health service level, Integrated Development Post for Non-Communicable Diseases (*Posbindu* Penyakit Tidak Menular) plays a strategic role in the promotive and preventive efforts of non-communicable diseases. *Posbindu* functions as a facility for risk factor screening, health status monitoring, and health education for adult and elderly populations (8). Through routine *Posbindu* activities, older adults can obtain health information, including weight management and the implementation of healthy dietary patterns. Local data indicate that obesity is also a concern in Karawang Regency. The Karawang Regency Health Profile reports that obesity is among the top five non-communicable diseases identified through screening activities at *Posbindu* and community health centers (24). Publications from the Karawang Regency Statistics Office show an increase in the elderly population in Teluk Jambe Barat and Teluk Jambe Timur subdistricts in recent years (5). This condition has the potential to increase the burden of obesity and non-communicable diseases among the elderly in the area. However, studies specifically evaluating the effectiveness of leaflet media as a tool for nutrition education related to obesity among older adults at *Posbindu* Teluk Jambe are still limited. Therefore, this study focuses on assessing the effect of nutrition education leaflets on improving the nutritional knowledge of older adults at *Posbindu* Teluk Jambe, Karawang Regency. This study aims to determine the effect of providing nutrition education leaflets related to obesity on the level of nutritional knowledge among older adults at *Posbindu* Teluk Jambe, Karawang Regency. It is expected that this research will provide an overview of the effectiveness of leaflet media as a nutrition education tool in improving older adults' understanding of obesity, its risk factors, and strategies for prevention and control through the implementation of healthy dietary patterns and active lifestyles.

2. METHODS

This study employed a quantitative design with a pre-experimental approach using a one-group pretest–posttest design. This design was used to assess changes in knowledge levels before and after the intervention within the same group (15). The study was conducted at Integrated Development Post for Non-Communicable Diseases

(*Posbindu Penyakit Tidak Menular*) Teluk Jambe, Karawang Regency, in 2025. The population consisted of all older adults registered and actively participating in *Posbindu* activities. The sample included older adults who met the inclusion criteria, namely aged ≥60 years, able to communicate well, willing to participate as respondents, and able to complete the entire research procedure. The sampling technique used was total sampling of elderly individuals present during *Posbindu* activities (31). The independent variable in this study was the provision of nutrition education leaflets related to obesity, while the dependent variable was the level of nutritional knowledge among older adults. The intervention was carried out by distributing leaflets containing information on the definition of obesity, risk factors, the impact of obesity in the elderly, principles of balanced nutrition, and recommendations for physical activity for older adults. Printed educational media are recommended in health promotion because they are easy to understand and effective in increasing target knowledge (18).

The intervention was conducted using nutrition education leaflets containing comprehensive information related to obesity in older adults. The materials included the definition of obesity, risk factors, health impacts, and physiological changes associated with aging (2). The leaflets also provided information on anthropometric indicators such as Body Mass Index (BMI) and waist circumference to support self-monitoring of nutritional status (37,39). In addition, the leaflets covered balanced nutrition principles, including the distribution of macronutrients, portion control, meal frequency, and daily menu examples (9,28). Guidance on limiting sugar, salt, and fat intake, as well as meeting vitamin and mineral requirements, was also included to support the prevention of non-communicable diseases (3,12,21,29). The educational materials further emphasized healthy lifestyle practices such as regular physical activity, adequate sleep, stress management, and avoidance of smoking and alcohol consumption (11,14). Information on fiber and fluid intake was also provided to support digestive health and metabolic function among older adults (34,40).

Data collection was conducted using a nutritional knowledge questionnaire administered before the intervention (pre-test) and after the intervention (post-test). The questionnaire instrument was used to measure respondents' knowledge related to obesity and nutrition among older adults. Repeated measurements on the same subjects were conducted to assess changes in knowledge scores after the intervention (23). Data analysis was performed using univariate and bivariate methods. Univariate analysis was used to describe the distribution of nutritional knowledge scores. A normality test was conducted to determine the data distribution. Since one of the datasets was not normally distributed, the difference between pre-test and post-test scores was analyzed using the Wilcoxon Signed Rank Test. The Wilcoxon test is recommended for paired data that are not normally distributed. The level of significance was set at $p < 0.05$ (36). This study received ethical approval from the Health Research Ethics Committee of the relevant institution. All respondents were provided with an explanation of the study objectives and procedures and signed an informed consent form prior to data collection, in accordance with ethical principles in health research.

3. RESULTS

a) Responden Characteristic

The characteristics of respondents in this study are presented to provide a general overview of the profile of older adults who participated as research subjects at *Posbindu* Teluk Jambe, Karawang Regency. The characteristics analyzed include gender and age

of the respondents. Presenting these characteristics is important to understand the respondents' background, which may influence their level of nutritional knowledge as well as their response to the leaflet-based nutrition education intervention related to obesity. The total number of respondents in this study was 31 older adults.

Table 1. Respondent Characteristics by Gender and Age

Variable	Category	n	%
Gender	Male	7	22.6
	Female	24	77.4
Age (years)	60–65	18	58.1
	66–70	12	38.7
	81–85	1	3.2
Total		31	100

Based on Table 1, the majority of respondents were female, totaling 24 individuals (77.4%), while male respondents accounted for 7 individuals (22.6%). This indicates that the participation of elderly women in *Posbindu* Teluk Jambe activities was more dominant compared to elderly men.

Based on age groups, most respondents were in the 60–65 years age range, with 18 individuals (58.1%). Respondents aged 66–70 years accounted for 12 individuals (38.7%), while only 1 respondent (3.2%) was in the 81–85 years age group. This distribution indicates that the majority of respondents fall into the early elderly category, which is an important group for obesity prevention and control through nutrition education.

b) Level of Nutritional Knowledge Before and After Leaflet Intervention

This subsection presents an overview of the nutritional knowledge level of older adults before (pre-test) and after (post-test) the intervention in the form of nutrition education leaflets related to obesity. These data are used to assess changes in nutritional knowledge as one of the indicators of the effectiveness of the educational intervention.

Table 2. Nutritional Knowledge Levels of Older Adults (Pre-Test and Post-Test)

Variable		n	%
Pre-test	Poor	26	83.9
	Fair	5	16.1
Post-test	Poor	10	32.3
	Fair	21	67.7
Total		31	100

Based on the pre-test results, the majority of older adults had a low level of nutritional knowledge, with 26 individuals (83.9%) categorized as having poor knowledge. Meanwhile, only 5 individuals (16.1%) were categorized as having fair knowledge. These findings indicate that prior to the intervention, the nutritional knowledge of older adults regarding obesity was still relatively low.

After the intervention using nutrition education leaflets, the post-test results showed a significant descriptive improvement. The number of older adults with fair nutritional knowledge increased to 21 individuals (67.7%), while those in the poor category decreased to 10 individuals (32.3%). These results indicate that the leaflet-based nutrition education had a positive effect on improving nutritional knowledge among older adults regarding obesity at *Posbindu* Teluk Jambe, Karawang Regency.

c) Description of Nutritional Knowledge Scores Before and After Intervention

The measurement results of nutritional knowledge among older adults before and after the provision of nutrition education leaflets related to obesity showed an increase in knowledge scores. The mean pre-test score was 3.81, with a standard deviation of 1.642, a median of 4.00, and a score range of 1–7. After the intervention, the mean score increased to 6.00, with a standard deviation of 1.065, a median of 6.00, and a score range of 4–8.

Table 3. Distribution of Nutritional Knowledge Scores (Pre-Test and Post-Test)

Variable	Mean	SD	Median	Minimum	Maximum
Pre-test	3.81	1.642	4.00	1	7
Post-test	6.00	1.065	6.00	4	8

d) Normality Test of Nutritional Knowledge Scores

A normality test was conducted to determine the distribution of nutritional knowledge scores before and after the intervention. The results showed a significance value of 0.165 (>0.05) for the pre-test and 0.005 (<0.05) for the post-test. These results indicate that one of the datasets was not normally distributed; therefore, the analysis of differences in scores was performed using a non-parametric test.

Table 4. Results of Normality Test for Nutritional Knowledge Scores

Variable	Significance Value	Description
Pre-test	0.165	Normally distributed
Post-test	0.005	Not normally distributed

e) Analysis of Differences in Nutritional Knowledge Scores (Pre-Test and Post-Test)

The analysis of differences in nutritional knowledge scores before and after the intervention was conducted using the Wilcoxon Signed Rank Test. The results showed a Z value of -3.771 with an Asymp. Sig. (2-tailed) value of 0.000 ($p < 0.05$). These findings indicate a statistically significant difference between the nutritional knowledge scores before and after the provision of nutrition education leaflets related to obesity.

Table 5. Wilcoxon Test Results for Nutritional Knowledge Scores

Statistical Test	Z Value	Asymp. Sig. (2-tailed)	Description
Wilcoxon	-3.771	0.000	Significant ($p < 0.05$)

4. DISCUSSION

a) Implementation of Findings

The Wilcoxon test results indicate a significant increase in the nutritional knowledge of older adults following the leaflet intervention, as reflected by the higher mean post-test score compared to the pre-test score. The implementation of education through printed media provides older adults with the opportunity to reread the material independently and discuss it with their family members. This knowledge-based educational model aligns with health promotion approaches that emphasize understanding as the foundation for behavioral change (19). The implementation of the intervention at *Posbindu* Teluk Jambe enables the integration of education with routine health monitoring activities. Older adults not only receive information but also relate the leaflet content to practical activities such as body weight measurement and waist circumference monitoring. The integration of education with promotive services has

been shown to enhance information retention and increase the relevance of the material for older populations (38). The improvement in knowledge scores also indicates that the material presented is applicable and aligned with the needs of older adults. Information regarding obesity, risk factors, and preventive measures provides a more systematic framework for older adults to understand their health conditions. Recent studies suggest that structured education improves health literacy and enhances the ability of older adults to make informed decisions regarding diet and physical activity (10). Significant changes in knowledge have implications for potential medium-term behavioral changes. Although this study focuses on knowledge, improved understanding is an important prerequisite for adopting a healthy lifestyle. Intervention studies have shown that increased nutritional knowledge among older adults is associated with improved food choices and increased physical activity during follow-up periods (27).

b) The Effect of Nutrition Education Leaflets on Obesity among Older Adults at *Posbindu* Teluk Jambe, Karawang Regency

The results of this study indicate that the provision of nutrition education leaflets related to obesity has a significant effect on improving nutritional knowledge among older adults at *Posbindu* Teluk Jambe, Karawang Regency. The increase in the mean knowledge score from 3.81 in the pre-test to 6.00 in the post-test, along with the Wilcoxon test result of p=0.000, demonstrates that leaflet-based educational interventions are effective in improving older adults' understanding of obesity and its prevention. The decrease in standard deviation in the post-test also indicates that respondents' understanding became more uniform after the intervention. The effectiveness of leaflets as an educational medium can be explained through health promotion theory, which emphasizes the importance of presenting information that is simple, repetitive, and easily accessible, especially for older adults. Printed media allow older adults to reread the material as needed, thereby strengthening the internalization of information. Tamura et al. (2020) explain that health literacy-based educational media play an important role in improving individuals' capacity to understand and use health information in daily decision-making (33).

These findings are also consistent with the Health Belief Model, which states that increased knowledge about disease risks and impacts can influence perceptions of susceptibility and severity, thereby enhancing individuals' readiness to take preventive actions. Information in the leaflet regarding the impact of obesity, risk factors, and preventive measures helps increase older adults' perception of obesity risk. Champion and Skinner (2020) state that educational interventions emphasizing risks and benefits of preventive actions are associated with increased knowledge and readiness for behavioral change (6). Furthermore, the results of this study are consistent with various recent studies reporting that the use of leaflets and printed media in health promotion effectively improves knowledge among older adults. A study by Volpe et al. (2016) showed that simple printed-based educational interventions can improve understanding of non- communicable diseases and their risk factors among the elderly (35). This strengthens the finding that leaflets are a relevant and practical medium for use in *Posbindu* activities as a means of nutrition education and obesity prevention.

5. CONCLUSION

This study demonstrates that the provision of nutrition education leaflets related to obesity has a significant effect on improving nutritional knowledge among older adults at *Posbindu* Teluk Jambe, Karawang Regency. The increase in the mean knowledge

score from pre-test to post-test, along with the Wilcoxon test results indicating a significant difference, confirms that leaflets are an effective educational medium in enhancing older adults' understanding of obesity, its risk factors, health impacts, and preventive efforts through dietary regulation and physical activity. These findings emphasize that the use of simple, structured printed educational media tailored to the characteristics of older adults can support the improvement of nutritional literacy in this population. Leaflets containing practical and applicable information have the potential to help older adults recognize their health conditions and increase awareness of the importance of obesity prevention. The findings of this study also have implications for the implementation of *Posbindu* activities by integrating leaflet media as part of routine educational programs. The application of this educational medium can serve as a promotive and preventive strategy in efforts to control obesity among older adults at the community level.

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