B-ICON Proceeding

A COMPARATIVE STUDY OF KNOWLEDGE AND PRACTICE REGARDING THE '*ISI PIRINGKU*' DIETARY GUIDELINES AMONG WOMEN OF REPRODUCTIVE AGE AT PASAR IKAN PUBLIC HEALTH CENTER, BENGKULU CITY

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Abstract

Women aged 15 to 49 are categorized as women of reproductive age (WRA), during which the reproductive system functions optimally to support pregnancy and childbirth. During this period, adequate and balanced nutrition is essential to maintain good health. Poor nutritional intake among WRA can lead to various issues such as iron deficiency anemia and chronic energy deficiency (CED), which may result in low birth weight (LBW), stunting in children, and an increased risk of maternal mortality. According to 2023 SKI data, the prevalence of CED among pregnant WRA decreased to 16.9%, while among non-pregnant WRA, it increased to 20.6%. However, many WRA are still unaware of the importance of balanced nutrition. This study aims to examine the differences in knowledge and practices before and after the "*Isi Piringku*" nutrition education among WRA at Pasar Ikan Public Health Center. A quantitative approach was used with a one-group pretest-posttest design. A total of 55 participants were selected using random sampling. The Wilcoxon signed-rank test was used to analyze the data. The results showed a significant difference in knowledge and practices before and after the intervention, with a p-value of 0.000 (<0.005). Nutrition education significantly improved WRA's knowledge and practice of balanced diets.

Keywords: Women of Reproductive Age, Knowledge, Practice, My Plate, Isi Piringku

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INTRODUCTION

Women of reproductive age (WRA), defined as those aged 15–49 years, constitute a critical population group within the life cycle. This stage represents a period when the reproductive system is in its optimal condition, directly influencing pregnancy and childbirth outcomes. Therefore, ensuring an optimal health status during this phase is of paramount importance (Safitri et al., 2020). A key strategy to achieve optimal health status in women of reproductive age (WRA) is fulfilling their nutritional requirements (Sulymbona, 2024).

The nutritional requirements of women of reproductive age (WRA) differ from those of toddlers, children, and the elderly. An imbalance in nutrient intake among WRA may lead to nutritional problems (Fadhilah and Noerfitri, 2023) Inadequate nutrition during this period can result in various

health issues, including iron-deficiency anemia and chronic energy deficiency (CED) in pregnant women, which may further contribute to low birth weight (LBW), stunting in children, and increased maternal mortality risk. Evidence suggests that stunting during early childhood can elevate the risk of obesity in adulthood. Moreover, nutrient deficiencies during pregnancy shift energy utilization toward greater carbohydrate dependence, which is associated with hyperinsulinemia and reduced insulin sensitivity, ultimately predisposing individuals to a higher body mass index (BMI) in later life (Octaviane and Syafiq, 2022). The prevalence of both macro- and micronutrient deficiencies continues to rise significantly worldwide, making malnutrition a critical public health issue that requires special attention, particularly among vulnerable groups such as pregnant women and children under two years old (Istibakhati, 2019).

Among women of reproductive age (WRA), excessive nutrient intake combined with insufficient physical activity may result in overnutrition, manifested as overweight and obesity (Hutasoit, 2020). These conditions substantially increase the risk of hypertension and diabetes mellitus. In addition, obesity in WRA has been linked to adverse effects on fertility, including ovulatory dysfunction, menstrual cycle disturbances, and endometrial dysfunction (Andreu et al., 2023).

According to the 2023 Indonesia Health Survey (SKI), the prevalence of chronic energy deficiency (CED) among pregnant women of reproductive age (WRA) declined to 16.9%, whereas the prevalence among non-pregnant WRA increased to 20.6%. The same survey also revealed that 12.6% of children were stunted. In addition, obesity among WRA in Indonesia remains a significant concern, with 31.2% reported to be obese based on the 2023 SKI data (BKPK, 2023).

A sedentary lifestyle or unhealthy living behavior poses a risk of leading to poor dietary habits, characterized by unhygienic and unbalanced food intake. Such behavioral patterns may be influenced by several factors, including demanding work schedules, limited time spent at home, and increases the risk of exposure to pollution (Fadhilah and Noerfitri, 2023). A balanced diet refers to daily food consumption that provides a variety of nutrients in both quality and quantity according to the body's needs. This concept emphasizes dietary diversity, adequate physical activity, clean and healthy living behaviors, and regular weight monitoring to maintain optimal nutritional status (Persatuan Ahli Gizi Indonesia and Asosiasi Dietisien Indonesia, 2019).

Since 1995, the Directorate of Nutrition of the Ministry of Health of the Republic of Indonesia has continuously implemented programs to promote balanced nutrition consumption in the community, which is currently known as the General Guidelines for Balanced Nutrition (PUGS). Balanced nutrition refers to the daily composition of foods that provide nutrients in both type and amount according to the body's physiological needs. The fulfillment of balanced nutrition is based on four

main principles: dietary diversity, regular physical activity, clean and healthy living behaviors, and routine weight monitoring (Permenkes, 2014). PUGS outlines these principles through its four pillars: consuming a variety of foods, practicing clean living habits, engaging in physical activity, and maintaining a normal body weight. Within PUGS, a visualization of meal composition is provided through the “Isi Piringku” (My Plate) guidance, which illustrates the recommended food portions in a single meal. This concept is highly relevant to Indonesian society as it considers food availability and local eating habits. The “Isi Piringku” program, promoted by the government, represents one of the key efforts to improve the quality of dietary intake among the population.

The gap between knowledge and practice may be one of the contributing factors to the low consumption of a balanced diet. Awareness of maintaining a healthy and balanced eating pattern remains limited; therefore, initiatives are needed to enhance understanding of balanced nutrition in order to promote the adoption of healthy and balanced dietary practices (Sulymbona, 2024).

Enhancing knowledge and awareness of balanced nutrition can be facilitated through nutrition education. Nutrition education is a structured learning process concerning food and nutrients. It serves as a comprehensive approach designed to foster voluntary behavioral changes in dietary practices and nutrition-related habits, ultimately aiming to improve health outcomes and enhance overall quality of life (Supu et al., 2022).

Based on these considerations, the researcher is interested in examining the differences in knowledge and practices before and after the “Isi Piringku” nutrition education among women of reproductive age (WRA) at Pasar Ikan Health Center, Bengkulu City, in 2025. The aim of this study is to determine the differences in knowledge and practices of WRA respondents before and after receiving the “Isi Piringku” education at Pasar Ikan Health Center, Bengkulu City, in 2025. The findings of this study are expected to improve knowledge and promote healthier eating practices among WRA, thereby supporting a more balanced diet at Pasar Ikan Health Center, Bengkulu City.

The Introduction section should provide a comprehensive overview, covering the study's background, problem statement, objectives, and benefits. It is essential to describe the current situation and establish the significance of the research by contextualizing the problem on a global, regional, national, and local scale. Discuss existing programs, interventions, policies, and the findings of previous studies to demonstrate the current state of knowledge. Finally, articulate the clear rationale for conducting this research and present the specific research questions or hypotheses that your study aims to address.

METHODS

This study was conducted at Pasar Ikan Health Center, Bengkulu City, using a quantitative approach with a one-group pre-test post-test design. The study population consisted of all women of reproductive age (15–49 years) residing within the working area of Pasar Ikan Health Center, Teluk Segara District, Bengkulu City. Ethical approval for this study was obtained from the Health Research Ethics Committee (KEPK) of Poltekkes Kemenkes Bengkulu, with approval number: KEPK.BKL/468/05/2025.

The sample size was calculated using the Lemeshow formula (1997), resulting in 55 respondents. A stratified random sampling method was applied to ensure group representation, with stratification based on the respondents' residential sub-districts. The study included women aged 15–49 years who met the following inclusion criteria: residing in the working area of Pasar Ikan Health Center, not currently pregnant, free from congenital diseases that could affect nutritional status or dietary patterns, and willing to participate fully by signing an informed consent form. Exclusion criteria included respondents with chronic illnesses or those taking medications that could interfere with metabolism or appetite, as well as those who withdrew or declined to continue participation during the study.

In this study, the independent variable was the provision of "Isi Piringku" nutrition education, while the dependent variables were the knowledge and practices of women of reproductive age (WRA). The intervention was delivered using the visual "Isi Piringku" plate, supported by a food photo book. The education was conducted twice, each lasting approximately 10 minutes. The first intervention was carried out alongside the distribution of the informed consent form and the pre-test. On the following day, the researcher revisited the respondents to provide a more detailed education session and administer the post-test. After the intervention and with the initiation of practice, the respondents also received a reinforcement of the "Isi Piringku" material through a two-minute explanatory video, which was sent via WhatsApp personal messages over the course of one week.

The knowledge variable was measured using an "Isi Piringku" knowledge questionnaire consisting of 10 questions related to the definition and concept of "Isi Piringku." Each correct answer was scored 10, while incorrect answers were scored 0. The scores were then summed to obtain the total knowledge score for each respondent.

The practice variable was measured using the "Isi Piringku" visual method. Over a period of 7 days, respondents were asked to send photos of their lunch meals. A total of seven lunch photos per respondent were analyzed for conformity with the "Isi Piringku" guidelines. Each photo that met the criteria received a score of 1, while non-conforming meals received a score of 0 (Mayun et al., 2023).

The total practice score for the week was calculated by dividing the cumulative score by 7 and multiplying by 100%.

Primary data were collected directly through home visits to residents in each sub-district within the working area of Pasar Ikan Health Center, Bengkulu City. Secondary data were obtained from the 2024 records of WRA and the 2024 health profile of Pasar Ikan Health Center. Data analysis included both univariate and bivariate approaches. The univariate analysis described the knowledge and dietary practices of WRA before and after the "Isi Piringku" intervention. Normality testing was performed using the Kolmogorov-Smirnov test, as the sample size exceeded 50 participants. Since the normality test showed $p < 0.05$, indicating that both variables were not normally distributed and the data were paired, the Wilcoxon Signed-Rank Test was used for the bivariate analysis. This analysis aimed to determine whether there were significant differences in knowledge and practice scores before and after the "Isi Piringku" nutrition education among WRA

RESULTS AND DISCUSSION

This study involved 55 respondents of women of reproductive age (WRA) at Pasar Ikan Health Center, Bengkulu City. The majority of respondents were aged 30–39 years and 20–29 years. Most respondents had completed senior high school education, and a large proportion were housewives.

Table 1. Distribution of Correct Answers Among Women of Reproductive Age Before and After "Isi Piringku" Nutrition Education at Pasar Ikan Health Center, Bengkulu City, 2025

Question	**Correct Answers**		**Difference**
	Before (N, %)	After (N, %)	(%)
Definition of Isi Piringku	44 (80.0)	54 (98.2)	18.2
Concept of Isi Piringku	18 (32.7)	45 (81.8)	49.1
Composition of diverse foods	38 (69.1)	48 (87.3)	18.2
Frequency of vegetable intake per day	35 (63.6)	48 (87.3)	23.7
Frequency of fruit intake	23 (41.8)	35 (63.6)	21.8
Staple food group	21 (38.2)	36 (65.5)	27.3
Plant-based protein food group	41 (74.5)	52 (94.5)	20.0
Daily water consumption requirement	49 (89.1)	54 (98.2)	9.1
Importance of handwashing before and after meals	51 (92.7)	55 (100.0)	7.3
Foods as sources of vitamins and minerals	33 (60.0)	43 (78.2)	18.2

Table 1 shows changes in the correct responses of participants before and after receiving nutrition education. The question related to the concept of "Isi Piringku" demonstrated the highest increase in correct answers, with an improvement of 49.1%. Meanwhile, the question showing the smallest increase was regarding the importance of washing hands before and after meals.

The variable related to dietary practices among women of reproductive age (WRA) is illustrated in the following table;

Table 2. Food Consumption Distribution According to "Isi Piringku" Among Women of Reproductive Age, Pasar Ikan Health Center, Bengkulu City, 2025

Food Group	Before		After (7 Days Total)	
	Consumed N (%)	Not Consumed N (%)	Consumed N (%)	Not Consumed N (%)
Staple foods	49 (89.1)	6 (10.9)	47 (85.5)	8 (14.5)
Animal protein	49 (89.1)	6 (10.9)	45 (81.8)	10 (18.2)
Plant-based protein	16 (29.1)	25 (45.4)	33 (60.0)	22 (40.0)
Vegetables	24 (43.6)	25 (45.4)	43 (77.7)	12 (22.3)
Fruits	2 (3.6)	53 (96.4)	15 (27.8)	40 (72.2)

Table 2 shows that before receiving nutrition education, only a small proportion of women of reproductive age consumed fruits, at just 3.6%. After the education, fruit consumption over the 7-day period remained relatively low, at 27.8%.

Bivariate data analysis among women of reproductive age to identify differences in knowledge and practices before and after the "Isi Piringku" nutrition education was conducted using the Wilcoxon test, as shown in the following tables;

Table 3. Differences in Knowledge of Women of Reproductive Age Before and After "Isi Piringku" Nutrition Education at Pasar Ikan Health Center, Bengkulu City, 2025

Education Stage	Mean ± SD	p-value*
Pre-Test	65.45 ± 17.51	0.000
Post-Test	86.00 ± 9.34	

*Wilcoxon signed-rank test

Table 4. Differences in Eating Practices of Women of Reproductive Age Before and After "Isi Piringku" Nutrition Education at Pasar Ikan Health Center, Bengkulu City, 2025

Practice Stage	Mean ± SD	p-value*
Beginning of Study	53.82 ± 22.73	0.000
End of Study	67.48 ± 23.88	

*Wilcoxon signed-rank test

The bivariate analysis presented in Tables 3 and 4 demonstrates significant differences in both knowledge and dietary practices before and after the "Isi Piringku" nutrition education among women of reproductive age at Pasar Ikan Health Center, Bengkulu City, in 2025. Table 3 shows a statistically significant improvement in knowledge ($p = 0.000$), with the standard deviation decreasing from 17.51

to 9.34, indicating more consistent responses among participants after the intervention. Meanwhile, Table 4 indicates a significant change in dietary practices ($p = 0.008$), although the standard deviation slightly increased from 22.73 to 23.88, reflecting greater variability in participants' practices after the intervention.

The results of this study, conducted on 55 women of reproductive age (WRA) at Pasar Ikan Health Center, showed that the majority of respondents were in the age range of 20–39 years. Most respondents had completed senior high school education and were housewives.
The distribution of correct answers in the questionnaire before the intervention indicated that most WRA were unable to correctly answer key questions related to the Isi Piringku concept, such as the recommended daily frequency of fruit consumption, examples of staple food sources, and the basic concept of Isi Piringku.

After receiving nutrition education about Isi Piringku, the distribution of correct answers across all aspects showed an increase, and respondents were able to provide more accurate answers. Questions regarding the basic concept of Isi Piringku, frequency of fruit consumption, and examples of staple foods demonstrated the greatest improvement in correct responses. This finding indicates that the educational intervention successfully improved respondents' understanding of the importance of consuming a balanced diet with appropriate portion sizes.

These results are consistent with the study conducted by Mayun (2023), which reported that after receiving nutrition education, the knowledge of mothers with children under five (aged 19–29 years) improved from the "poor" to the "good" category, and there was a significant difference in knowledge scores on balanced nutrition and the Isi Piringku guideline, influenced by nutrition education (Mayun et al., 2023; Zean, 2024). In this study, a statistically significant difference ($p < 0.05$; $p = 0.000$) was observed between knowledge scores before and after education. The decrease in standard deviation also indicates an increase in the mean knowledge score along with a more uniform distribution of values. This suggests that the Isi Piringku educational intervention was effective in improving respondents' nutritional knowledge. Similarly, previous research has demonstrated that nutrition education significantly improves elementary school students' knowledge of balanced nutrition when using flipchart media (Putri et al., 2024).

Research on women of reproductive age (WRA) in Indonesia provides important insights into knowledge and health practices. A study conducted in Papua revealed that 51.8% of WRA experienced anemia, with the majority having poor knowledge regarding the condition (Ba'ka et al., 2023). Improving knowledge is crucial, as it forms the foundation for behavioral change. Adequate

understanding enables individuals to make healthier dietary decisions that meet their body's nutritional needs.

Age and educational attainment are strongly associated with the ability to comprehend and absorb nutritional information provided during interventions (Handayani et al., 2022). The use of visual educational media such as posters, leaflets, videos, or tangible tools such as the Isi Piringku plate has also been shown to enhance information retention (Bachmida et al., 2025). Knowledge plays a fundamental role as the basis for shaping eating habits, by influencing an individual's choices regarding the diversity and quantity of food consumed (Parapat et al., 2021).

Before the implementation of the Isi Piringku education, the average dietary practice scores among women of reproductive age (WRA) were still very low, with a wide variation in values. This indicates that many WRA had not yet applied the principles of Isi Piringku in their daily dietary patterns. Eating practices tended to be unbalanced, with several components of Isi Piringku such as plant-based protein, vegetables, and fruits not being consumed in adequate amounts. The dietary distribution prior to the intervention showed that most WRA rarely consumed fruits and plant-based protein. Following the education, practice scores increased on average, although they remained relatively low. This suggests a positive shift in habits towards a healthier lifestyle. However, the persistence of low minimum scores indicates that not all respondents were immediately able to implement the recommended practices effectively.

The lack of fruit and vegetable consumption in Indonesia remains considerably high (Salsabila and Kurniasari, 2023). According to Rahman (2020), various vitamins such as A, B, B1, and C, along with minerals and dietary fiber, play important roles as antioxidants. Regular fruit consumption contributes to the prevention of cardiovascular disease, liver dysfunction, and hypertension, while also supporting the enhancement of the body's immune system (Muchtadi, 2009).

Education that applies the Isi Piringku principles can enhance students' knowledge and skills in preparing healthy meals (Mayun et al., 2023). Socialization and practice of Isi Piringku also emphasize the importance of dietary diversity, with at least four different food groups in one meal, including carbohydrates, protein, vegetables, and fruits. This approach aims to meet the nutritional needs of women of reproductive age (WRA) and prevent nutritional problems such as stunting in children and chronic energy deficiency (CED) in pregnant women (Nuranissa et al., 2023).

The dietary practice results demonstrated a statistically significant difference ($p < 0.05$; $p = 0.00$), indicating changes in eating behavior before and after the educational intervention. The implementation of Isi Piringku education among WRA resulted in behavioral changes consistent with

the dietary guidelines. However, the findings also revealed variability in dietary practices among respondents, suggesting that the changes were not uniformly adopted. This inconsistency may be influenced by several factors. External factors such as food affordability, family support, and habitual eating patterns can affect respondents' ability to translate nutritional knowledge into practice (Kurnianingsih et al., 2022). Nutritional education that successfully improves knowledge can also encourage individuals to adopt healthier eating habits over time.

In addition, a study conducted by Nuchar et al. (2023) demonstrated that posters and portioning plates, as educational tools, were effective in improving knowledge among women of reproductive age (WRA); however, changes in dietary practices required a more comprehensive approach (Nuchar et al., 2023). These findings contrast with those of Tsabita et al. (2023), who reported that door-to-door nutrition education using leaflets increased knowledge among WRA in Depok but did not directly translate into changes in eating practices (Tsabita et al., 2023). An individual's confidence in their ability to adopt healthy eating behaviors (self-efficacy) plays a critical role in determining behavioral change.

One of the contributing factors to the lack of adherence to balanced nutrition in the community is the economic factor. In line with research conducted by Ibrahim and Faramita (2014), lower-middle socioeconomic groups tend to choose inexpensive foods that are low in nutritional value and lack dietary diversity. Conversely, individuals from higher socioeconomic groups also tend to purchase excessive amounts of foods with poor nutritional quality, such as fast food and sugar-rich snacks (Ibrahim and Faramita, 2015). Cultural factors further contribute to the insufficient application of balanced nutrition. Restrictions on consuming certain foods based on beliefs or traditions (food taboos) may have negative implications. Such dietary patterns driven by food taboos can result in inadequate nutrient intake, which in turn may contribute to stunting in children (Amri et al., 2024). Sustained behavioral change requires both internal motivation and external support, such as encouragement from family, peers, and the surrounding community, to ensure that balanced nutrition practices are consistently implemented in daily life.

These economic, cultural, and social dynamics highlight that while Isi Piringku education programs can effectively improve knowledge, their translation into consistent dietary practices requires a more holistic approach. Strengthening family involvement, addressing cultural barriers, and ensuring food accessibility are essential to maximize the long-term effectiveness of nutrition education interventions.

CONCLUSION

This study revealed a significant improvement in the knowledge level of women of reproductive age (WRA) before and after receiving Isi Piringku education, with a more evenly distributed increase in

scores following the intervention. Furthermore, a significant difference was also observed in dietary practices; however, the changes in practice were not uniformly adopted, indicating that some WRA have not yet fully applied the principles of Isi Piringku in their daily eating habits. This finding suggests that while nutrition education can effectively improve knowledge, its translation into consistent dietary practices may be influenced by various external factors.

Considering that this study was conducted over a period of only approximately 10 days for each woman of reproductive age (WRA), a more comprehensive approach with a longer intervention duration is deemed necessary to minimize the risk of participants reverting to their previous eating habits. Future research is also recommended to compare the nutritional requirements of WRA with the actual food intake based on the Isi Piringku guidelines.

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DECLARATION OF INTEREST STATEMENT

The authors declare that they have no conflict of interests.

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