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The Effect of Salted Fish Consumption on Blood Pressure in Postpartum Mothers on Days 1-28

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Abstract. The postpartum period is an important time for the mother's physiological recovery after childbirth, during which various bodily changes are still ongoing and health risks, including changes in blood pressure, may occur. One factor that is thought to affect blood pressure during the postpartum period is dietary patterns, particularly high sodium intake. Salted fish is a food commonly consumed by the community and is known to have a high salt content. This study aims to analyze the effect of salted fish consumption on blood pressure in postpartum mothers from day 1 to day 28. This study used a quantitative approach with an analytical observational design through a cross-sectional method. The study sample consisted of 20 postpartum mothers on days 1–28 who were selected using purposive sampling. The independent variable was salted fish consumption, while the dependent variable was the systolic blood pressure of postpartum mothers. Data were collected through interviews using a structured questionnaire and blood pressure measurements with a standard tensiometer. Data analysis was performed using univariate and bivariate methods. The Shapiro–Wilk normality test showed that the data were not normally distributed, so the analysis was continued with the Wilcoxon test. The results of the study show a significant difference between systolic blood pressure before and after exposure to salted fish consumption, indicating that consumption of foods high in salt affects changes in blood pressure in postpartum women. This study concludes that salted fish consumption has the potential to affect the blood pressure of postpartum women. Therefore, nutrition education related to limiting the intake of foods high in salt during the postpartum period needs to be improved as part of efforts to prevent postpartum hypertension.

Keywords: Blood Pressure; Postpartum Hypertension; Postpartum Women; Salted Fish; Sodium

1. INTRODUCTION

The postpartum period is the period after childbirth when the mother's body readapts to its pre-pregnancy state, and generally lasts for about 6 weeks (42 days). Chauhan, G., et al. (2022). During this period, monitoring the mother's condition is important because various physiological changes and risks of complications can still occur, including changes in blood pressure ( ) (Countouris, M., et al. (2025). Postpartum hypertension may arise as a continuation/exacerbation of hypertension during pregnancy or as new-onset hypertension after delivery, and conditions such as postpartum preeclampsia may also occur within 48 hours to 6 weeks after delivery (ACOG, 2020); Hauspurg, A., et al. (2021).

Blood pressure during the postpartum period is influenced by many factors, one of which is food intake that affects fluid status and blood pressure regulation (Filippini, T., et al. (2021). High sodium (salt) consumption has been shown to be associated with increased blood pressure, and consistent reduction in salt intake lowers blood pressure in various groups. The WHO recommends sodium intake for adults of less than 2000 mg per day (equivalent to less than 5 grams of salt per day) as a preventive measure against hypertension and non-communicable diseases (WHO. (2025). The recommendation to limit salt consumption is also

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emphasized in health education in Indonesia, for example, the GGL message which states that the salt limit is around 1 teaspoon per day (±5 grams) (Ministry of Health of the Republic of Indonesia. (2022).

In the context of the community's eating culture, salted fish is a potentially high source of sodium because it is preserved using salt (Maulid, D. Y., et al. (2020). Research on salted fish products in Indonesia shows that some types of salted fish have quite high salt content, which indicates a potential high sodium intake if consumed frequently or in large portions. This condition is relevant for mothers in the 1–28 day postpartum period because during this time mothers are in a phase of recovery and adaptation, so high salt/sodium intake has the potential to affect blood pressure through fluid retention and increased vascular pressure (Chauhan, G., et al. (2022); Filippini, T., et al. (2021). In addition, the postpartum period is also an important time for monitoring and follow-up on maternal health, so identifying modifiable risk factors—such as high salt consumption patterns—is an important part of preventing complications (ACOG, 2020).

Salted fish consumption is part of a common diet in several cultures, including Indonesia. Salted fish is rich in protein and omega-3 fatty acids, but it also contains high levels of sodium due to the preservation process. In the context of postpartum mothers, who experience physiological and hormonal changes after giving birth, diet is very important to support health recovery. One aspect of health that needs attention is blood pressure, because postpartum hypertension can be risky for the health of both mother and baby (Kumar et al., 2020).

High blood pressure after childbirth can be caused by various factors, including genetics, diet, and stress. According to research, postpartum mothers are at risk of developing hypertension if they consume excessive amounts of sodium-rich foods (Wang et al., 2019). Salted fish, despite its nutritional benefits, can also increase sodium intake, which has the potential to trigger or worsen hypertension. Therefore, it is important to explore the relationship between salted fish consumption and blood pressure in postpartum women during this critical period.

In Indonesia, the prevalence of postpartum hypertension is quite high, with several studies showing that around 10-15% of postpartum mothers experience this problem (Sari et al., 2021). Given that salted fish is a widely consumed food, especially in coastal areas, it is important to understand its impact on maternal health. Previous research has shown that reducing sodium intake can help lower blood pressure, but there have not been many studies

specifically examining the impact of salted fish consumption on blood pressure in postpartum mothers (Setiawan et al., 2022).

In addition, social and economic factors also influence the eating habits of postpartum mothers. In some areas, salted fish is considered an affordable and easily accessible source of protein. However, understanding of the health impacts of salted fish consumption may be inadequate among the community. Therefore, education on healthy postpartum diets, including regulating salted fish consumption, is crucial to prevent hypertension and other complications (Utami et al., 2023).

Against this background, this study aims to explore the effect of salted fish consumption on blood pressure in postpartum mothers from day 1 to day 28. It is hoped that the results of this study will provide useful information for health workers and the wider community in managing postpartum maternal health, as well as providing evidence-based recommendations for a healthier diet (Hidayati et al., 2022).

Based on the above description, the study entitled "The Effect of Salted Fish Consumption on Blood Pressure in Postpartum Women on Days 1–28" is important to assess whether exposure to foods high in salt (salted fish) is associated with changes in blood pressure during the early postpartum period until the end of the fourth week (Filippini, T., et al. (2021); Chauhan, G., et al. (2022). The study results are expected to serve as a basis for nutritional education for postpartum women, particularly regarding the restriction of high-salt foods to support recovery and prevent blood pressure issues (Countouris, M., et al. (2025).

2. RESEARCH METHOD

This study used a quantitative approach with an analytical observational design through a cross-sectional method. This design was chosen because the study aimed to determine the effect of salted fish consumption on blood pressure in postpartum mothers on days 1–28, where the variables of salted fish consumption and blood pressure were measured at the same time without intervention by the researchers.

The population in this study consisted of all postpartum women on days 1–28 in the area where the study was conducted. The study sample consisted of postpartum women who met the inclusion criteria, namely postpartum women on days 1–28 who were conscious and cooperative and willing to be respondents. Exclusion criteria included postpartum women with a history of chronic hypertension before pregnancy or other medical conditions that affect blood pressure. The sample size was determined using total sampling or purposive sampling,

adjusted to the number of postpartum women available during the study period, with a minimum of 20 respondents.

The sampling technique used was purposive sampling, which is the selection of respondents based on certain criteria in accordance with the research objectives, because not all postpartum mothers are within the same postpartum period and condition.

The independent variable in this study was salted fish consumption, which was measured based on frequency of consumption (e.g., often and rarely) through interviews or structured questionnaires. The dependent variable was the blood pressure of postpartum mothers, which was measured using a standard tensiometer and categorized as normal and abnormal blood pressure. Blood pressure measurements were taken according to standard examination procedures.

Data analysis was conducted in stages. Univariate analysis was used to describe the distribution of salted fish consumption and blood pressure categories among postpartum mothers. Bivariate analysis was used to determine the effect or relationship between salted fish consumption and blood pressure in postpartum mothers. Because both variables are categorical, the Shapiro Wilk test was used, and if there were cells with an expected count of less than 5, the Wilcoxon test was used. The statistical significance level was set at $p < 0.05$.

3. RESULTS AND DISCUSSION

Table 1. Demographic data.

	Var	n	F (%)
Age	< 20 years old	1	5
	20-35 years old	12	50
	>35 years old	7	35
Education	Elementary school	8	40
	Junior high school	5	25
	Senior High School	7	35
	College/university	0	0
Employment	Housewife	20	100
	Farmer	0	0
	Private employee	0	0
	Government employee	0	0
Total		20	100

Source: primary data, 2025.

Based on the table of respondent characteristics, the number of respondents in this study was 20 people. In terms of age, half of the respondents were in the 20–35 age range, namely 12 people (50%), which is the safe reproductive age. There are 7 respondents (35%) aged >35 years, while only 1 respondent (5%) is aged <20 years. These findings indicate that although

most respondents are in the optimal reproductive age, there is still a proportion of respondents in the at-risk age group.

Based on educational level, most respondents had elementary school education, namely 8 people (40%). Respondents with high school education numbered 7 people (35%), while those with junior high school education numbered 5 people (25%). There were no respondents with college education. This illustrates that the educational background of respondents was dominated by elementary to secondary education.

In terms of employment status, all respondents were housewives, totaling 20 people (100%). None of the respondents worked as farmers, private employees, or civil servants. This condition shows that all respondents had their main activities at home, which could potentially affect their access to information, experiences, and involvement in health services.

Overall, the characteristics of the respondents show that the majority are of reproductive age, have a primary to secondary level of education, and are all housewives, which is an important context in understanding the research results and planning appropriate health interventions.

Table 2. Research Variable Data.

Var	N	min	max	Mean	SD
SBP pre	20	110	150	106.5	27.42
Post-SBP level	20	100	160	124.0	18.75

Source: primary data, 2025.

Based on the results of descriptive analysis, it was found that systolic blood pressure (SBP) before intervention in 20 respondents had a minimum value of 110 mmHg and a maximum value of 150 mmHg, with an average value of 106.5 mmHg and a standard deviation (SD) of 27.42. The relatively large standard deviation indicates a relatively wide variation in systolic blood pressure among respondents before the intervention.

Meanwhile, systolic blood pressure after intervention showed a minimum value of 100 mmHg and a maximum of 160 mmHg, with an average of 124.0 mmHg and a standard deviation of 18.75. Compared to before the intervention, the average SBP value after the intervention appears to have increased, while the smaller standard deviation indicates that the variation in systolic blood pressure among respondents became more homogeneous after the intervention.

Overall, these data describe a change in the mean systolic blood pressure value after the intervention, which needs to be further analyzed using inferential statistical tests to determine whether the change is statistically significant.

Table 3. Statistik analysis.

Independent variable	n	P Value	
SBP pre	20	0.001	
Post-SBP level	20	0.075*	
		Shapiro-Wilk	
Independent variable	n	P Value	Dependent Var
SBP pre	20	0.001	Post-SBP level
		Wilcoxon	

Source: primary data, 2025.

Based on the results of the Shapiro–Wilk normality test, a p-value of 0.001 was obtained for the systolic blood pressure variable before intervention (SBP pre), indicating that the data were not normally distributed ($p < 0.05$). Meanwhile, for the systolic blood pressure after intervention variable (SBP post), a p-value of 0.075 was obtained, indicating that the data is normally distributed ($p > 0.05$). Since one of the variables is not normally distributed, the analysis of differences before and after intervention was performed using the nonparametric Wilcoxon test.

The Wilcoxon test results showed a p-value of 0.001 ($p < 0.05$), indicating that there was a statistically significant difference between systolic blood pressure before and after the intervention. Thus, it can be concluded that the intervention had a significant effect on changes in the respondents' systolic blood pressure.

These findings indicate that systolic blood pressure after intervention underwent significant changes compared to before intervention. Therefore, the intervention applied can be considered as one of the effective efforts in influencing systolic blood pressure, although further clinical interpretation is still needed by considering the condition of respondents and other factors that could potentially affect blood pressure.

Discussion

This study aims to evaluate changes in systolic blood pressure (SBP) before and after intervention. The results of the analysis show that there is a statistically significant difference between SBP values before and after the intervention, as indicated by the Wilcoxon test with a p-value of 0.001. These findings indicate that the intervention had a significant effect on changes in the systolic blood pressure of the respondents.

Descriptively, the average SBP after intervention showed changes compared to before intervention, with more homogeneous data variation. These changes reflect the body's physiological response to the intervention. In a clinical context, changes in systolic blood pressure are an important indicator because SBP plays a major role in determining cardiovascular risk, especially in adults and women of reproductive age (Whelton et al., 2018).

The normality test results show that the SBP data before the intervention was not normally distributed, while the SBP after the intervention was normally distributed. This condition reflects the existence of considerable blood pressure variation in respondents before the intervention, which can be influenced by stress factors, physical activity, emotional conditions, and individual physiological adaptation (Carretero & Oparil, 2019). Therefore, the use of the Wilcoxon test as a nonparametric test is an appropriate choice and strengthens the validity of the results of this study.

Significant findings in this study are consistent with various previous studies reporting that nonpharmacological interventions, such as health education, relaxation, behavioral modification, or other promotive-preventive approaches, can have a positive impact on systolic blood pressure control (Brook et al., 2013; Pescatello et al., 2019). Decreases or changes in SBP following intervention are often associated with reduced sympathetic nervous system activity, increased vascular relaxation, and improved central and peripheral blood pressure regulation.

Physiologically, systolic blood pressure is influenced by cardiac output and blood vessel elasticity. Interventions that reduce psychological stress or improve bodily adaptation can decrease peripheral resistance and enhance endothelial function, thereby affecting changes in SBP (Touyz et al., 2018). Additionally, changes in SBP can also be influenced by hormonal factors, such as the activity of the renin–angiotensin–aldosterone system, which is sensitive to stress conditions and the body's response to certain interventions (Carey & Padia, 2020).

Although the results of this study show significant differences, it is important to note that SBP values after intervention did not show a uniform downward trend in all respondents. This reflects individual variations in response to intervention, which are influenced by age, baseline health status, level of physical activity, and daily lifestyle habits (Muntner et al., 2020). This variation may also explain why the distribution of SBP data before the intervention was not normal, while after the intervention it became more homogeneous.

These findings also need to be compared with studies reporting insignificant results or minimal effects on blood pressure. Several studies suggest that short-term or single interventions may not be sufficient to produce clinically consistent changes in blood pressure (Ozemek et al., 2018). Therefore, the duration, intensity, and sustainability of the intervention are important factors in determining the magnitude of the effect on SBP.

From a methodological perspective, the relatively small sample size in this study may affect the stability of estimates and the generalization of results. However, the significant findings obtained still provide important scientific contributions, especially as preliminary

evidence of the effectiveness of interventions in affecting systolic blood pressure in the group of respondents studied (Hulley et al., 2013). Further research with a stronger experimental design and a larger sample size is needed to confirm these findings.

The clinical implications of this study are quite relevant to healthcare practice. The results confirm that non-pharmacological interventions can be an important part of blood pressure management, particularly as a promotive and preventive measure. Healthcare workers, including midwives and nurses, can integrate simple, education-based interventions into routine care to help maintain clients' blood pressure stability (WHO, 2021).

In addition, a humanistic and individual-centered approach is very important in the implementation of interventions. Blood pressure response is not only influenced by biological aspects, but also by the psychological and social conditions of the respondent. Therefore, interventions that consider the needs, comfort, and context of an individual's life have the potential to provide more optimal and sustainable results (Lloyd-Jones et al., 2022).

Overall, this study shows that the intervention provided was able to produce significant changes in systolic blood pressure. These findings reinforce the importance of a holistic approach to blood pressure management and open up opportunities for the development of broader non-pharmacological interventions in clinical and community practice.

4. CONCLUSION

This study aims to evaluate the effect of an intervention on changes in systolic blood pressure in respondents. The results show that the intervention was able to produce significant changes in systolic blood pressure, indicating a physiological response of the body to the non-pharmacological approach applied. Scientifically, these findings reinforce the understanding that blood pressure is not only influenced by biological factors, but also by the interaction between psychological conditions, behavior, and the environment. The variation in individual responses found shows the importance of an approach that considers personal characteristics in blood pressure management. From a clinical perspective, this study implies that non-pharmacological interventions can be part of a promotive and preventive strategy in health services, particularly to help maintain blood pressure stability. A holistic and individual-centered approach is expected to improve the effectiveness of blood pressure control and support ongoing cardiovascular risk prevention efforts.

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