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# The Relationship Between Dietary Patterns, Physical Activity, and Hypertension Among Nasi Kapau Vendors

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**ABSTRACT**

**Abstract:** Hypertension is a health issue linked to diet and physical activity. Nasi kapau vendors often consume foods that are potentially high in fat and sodium. According to data from the Bukittinggi City Health Office, in 2025, the number of people with hypertension was 8,329. This study aimed to determine the association between diet, physical activity, and the incidence of hypertension among nasi kapau vendors at Benteng Pasar Atas, Bukittinggi City. A cross sectional study design was employed, involving 48 respondents selected via total sampling. Data were collected using a semi quantitative food frequency questionnaire, the International Physical Activity Questionnaire (IPAQ), and blood pressure measurements. Univariate and bivariate analyses were performed using the chi square test. The results showed that 60.4% of respondents had hypertension, 77.1% had poor dietary habits, and 72.9% engaged in moderate physical activity. Diet was associated with hypertension (p=0.003), whereas physical activity was not (p=0.079). Thus, diet showed a significant association with hypertension, while physical activity did not. Vendors are advised to limit their intake of high fat and high sodium foods and to increase their consumption of vegetables and fruits.

**Keywords:** hypertension,dietary,physical activity,nasi kapau vendors,SQ-FFQ,IPAQ

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## INTRODUCTION

**Background :** According to the World Health Organization(world health Organization, 2021), approximately 1.13 billion people worldwide suffer from hypertension, and this figure is projected to rise to 1.5 billion by 2026. WHO data indicates that the number of adults with hypertension increased from 650 million in 1990 to 1.4 billion in 2024, with the majority of this increase occurring in low and middle income countries (Pola et al., 2025). According to data from the Bukittinggi City Health Office, the number of hypertension patients in 2025 stands at 8,329. The data indicates that the highest number of cases 1,998 occurred within the service area of the Guguak Panjang Community Health Center (Puskesmas), followed by 1,220 cases in the Rasimah Ahmad Community Health Center's service area; these areas encompass the population with the highest concentration of Nasi Kapau vendors in Bukittinggi City (Dinas Kesehatan Kota Bukittinggi, 2025). In general, the causes of hypertension are multifactorial. Based on H.L. Blum's

theory of health determinants, health status is influenced by four key factors: environment, behavior, healthcare services, and heredity(Kartika & Mirsiyanto, 2021). Among these various factors, behavioral factors play a dominant role in the development of hypertension. This is supported by research indicating that modern lifestyle changes such as the consumption of foods high in fat and salt, combined with low levels of physical activity contribute significantly to elevated blood pressure(Irwanto et al., n.d.). Diet is a key determinant in the development of hypertension. Consuming foods high in fat particularly saturated and trans fats can raise blood cholesterol levels, leading to atherosclerosis(Wildatus Sholeha, 2023). This condition causes the narrowing of blood vessels, thereby increasing peripheral resistance and blood pressure. Furthermore, an unbalanced diet is often linked to weight gain or obesity, both of which are major risk factors for hypertension. Research by the American Heart Association indicates that a diet high in fat and low in fiber significantly increases the risk of hypertension and cardiovascular disease (American Heart Association, 2020). In addition to diet, physical activity is a crucial factor influencing blood pressure. Low levels of physical activity lead to reduced blood vessel elasticity and increased vascular resistance. Conversely, adequate physical activity helps maintain a healthy weight, enhances heart function, and improves blood circulation(Hayes et al., 2022). Studies published in journals such as the Journal of Hypertension and The Lancet indicate that individuals with low levels of physical activity face a higher risk of developing hypertension compared to those who are physically active. The Benteng Pasar Atas area in Bukittinggi City commonly known as Los Lambuang is a bustling hub for traditional culinary tourism, where Nasi Kapau vendors play a vital role in the region's culinary identity(Bull et al., 2020). These vendors not only provide food but also frequently consume the very dishes they sell. Long-term exposure to high-fat foods combined with suboptimal physical activity renders this group vulnerable to hypertension(American Heart Association, 2020)

**Literature Review :** A 2024 study by Azizah Syah Putri and Izza Suraya, published in the Journal of Science and Health titled "The Relationship of Physical Activity, Cigarette Consumption, Fat Consumption, and Health Literacy with the Severity of Hypertension" examined the impact of physical activity on hypertension. The findings identified physical activity as a risk factor for the condition. Specifically, the study revealed a significant association between physical activity levels and the severity of hypertension at the Larangan Utara Community Health Center in 2023 (p-value = 0.030)(Azizah Syah Putri1*, 2024). The prevalence ratio indicated that respondents with low levels of physical activity were 1.79 times more likely to develop Grade II hypertension compared to those with adequate physical activity (PR = 1.79). This is because physical activity helps regulate cardiac function, thereby influencing blood pressure levels(Anisa et al., 2025). Other research similarly identifies physical activity as a risk factor for hypertension, indicating that individuals engaging in light physical activity face a higher risk of the condition compared to those engaging in vigorous physical activity (Bull et al., 2020). A 2023 study by Dika Lukitaningtyas, titled "Literature Review: The Relationship Between Dietary Patterns and the Incidence of Hypertension," analyzed seven articles; all of them demonstrated a significant association between dietary patterns and the incidence of hypertension. Caffeine consumption patterns were associated with hypertension (p=0.023), seafood consumption was associated with hypertension (p=0.000), and general dietary patterns were associated with hypertension (p-values ranging from 0.000 to 0.028). There is a

significant relationship between dietary patterns (specifically caffeine consumption, seafood consumption, and other dietary habits) and hypertension(Aulia et al., n.d.)

**Research Gap :** Although dietary patterns and physical activity have been widely studied in relation to hypertension, research specifically examining nasi Kapau vendors in the Benteng Pasar Atas area of Bukittinggi City remains limited. Food vendors represent a specific occupational group whose daily environment is closely related to food availability and work related physical activities(meri erawati,zulfa, 2024).

**Novelty and Rationale of the Study :** The novelty of this study lies in the simultaneous examination of dietary patterns and physical activity among nasi kapau vendors at Benteng Pasar Atas in Bukittinggi City. The study not only describes the prevalence of hypertension but also assesses dietary patterns based on the type and frequency of food consumption as well as sodium and fat content and compares these factors with the occurrence of hypertension. Furthermore, the study provides specific insights into the physical activity of this group of nasi kapau vendors, the majority of whom engage in moderate physical activity. The results indicate a significant association between dietary patterns and hypertension, whereas physical activity shows no significant association.

**Research Objectives :** This study aimed to analyze the relationship between dietary patterns and physical activity with hypertension status among Nasi Kapau vendors at Benteng Pasar Atas, Bukittinggi City, in 2026

## METHODS

**Study Design :** This study employed an analytical observational design with a quantitative approach and cross sectional design. The study examined the relationship between dietary patterns and physical activity as independent variables and hypertension as the dependent variable.

**Research Location and Timeline :** The research was conducted among nasi Kapau vendors at Benteng Pasar Atas, Bukittinggi City, from 7 May to 28 June 2026.

**Population and Sampling Technique :** The study population consisted of nasi Kapau vendors in the Benteng Pasar Atas area of Bukittinggi City. A total of 48 respondents participated in this study. The sampling technique employed was total sampling, wherein all members of the population meeting the study criteria were included as respondents

**Data Collection Procedures and Instruments :** Dietary pattern data were collected using a Semi-Quantitative Food Frequency Questionnaire (SQ-FFQ) and processed using NutriSurvey to estimate the intake of energy and nutrients. Physical activity was measured using the International Physical Activity Questionnaire (IPAQ) and processed using SPSS. The occurrence of hypertension was determined through blood pressure measurements. All collected data were subsequently processed and analyzed using SPSS**.**

**Statistical Analysis :** Univariate analysis was conducted to describe the distribution of dietary patterns, physical activity, and hypertension. Bivariate analysis was performed using the Chi-Square test to determine the relationship between dietary patterns and physical activity with hypertension. The significance level used was 0.05.

**Scope and/or Limitations of the Methodology Used :** The cross-sectional design of this study identifies relationships between variables at one point in time and therefore cannot establish causal relationships. Dietary and physical activity data were also obtained through questionnaires, which may be affected by respondents' ability to recall their usual consumption and activities.

## RESULTS

### Results and Discussion :

#### Characteristics of Respondents and Main Variables

**Table 1 Respondent Characteristics**

| Characteristic | Frequency | Percentage |
|---|---|---|
| **Non Productive age (>64)** | 2 | 4.2% |
| **Productive (15 - 64)** | 46 | 95.8% |

| Characteristic | Frequency | Percentage |
|---|---|---|
| **Gender** | | |
| **Man** | 11 | 22.9% |
| **Woman** | 37 | 77.1% |
| **Education** | | |
| **Elementary school** | 17 | 35.4% |
| **Junior high school** | 9 | 18.8% |
| **Senior High School** | 20 | 41.7% |
| **Collage** | 2 | 4.2% |

Based on the respondent characteristics table, of the 48 respondents, the majority were in the productive age group (15–64 years), consisting of 46 respondents (95.8%), while 2 respondents (4.2%) were in the non-productive age group (>64 years). In terms of gender, most respondents were female, with 37 respondents (77.1%), while 11 respondents (22.9%) were male. Regarding educational level, most respondents had completed senior high school (SMA), with 20 respondents (41.7%), followed by elementary school (SD) with 17 respondents (35.4%), junior high school (SMP) with 9 respondents (18.8%), and higher education with 2 respondents (4.2%). Thus, the respondents were predominantly of productive age, female, and had a senior high school education.

### Univariate Analysis

**Table 2 Univariate Analysis**

| Variable | category | Frequency (%) | Percentage |
|---|---|---|---|
| **Dietary habit** | Not good | 37 | 77.1% |
| | Good | 11 | 22.9% |

| | | | |
|---|---|---|---|
| **Physical Activity** | Light | 13 | 27.1% |
| | Medium | 35 | 72.9% |
| **Hypertension** | Hypertension | 29 | 60.4% |
| | Not Hypertension | 19 | 39.6% |

The study involved 48 nasi Kapau vendors at Benteng Pasar Atas, Bukittinggi City. The results showed that 29 respondents (60.4%) experienced hypertension, while the remaining respondents did not experience hypertension. Regarding dietary patterns, 22.9% of respondents had good dietary patterns, while 77.1% had poor dietary patterns. For physical activity, 27.1% of respondents had light physical activity and 72.9% had moderate physical activity. Based on Table 2, it can be concluded that regarding the dietary patterns of the 48 Nasi Kapauvendors surveyed, 37 respondents (77.1%) fell into the "poor" category, while 11 respondents (22.9%) fell into the "good" category. Regarding physical activity, the majority of respondents (35 or 72.9%) were categorized as having a moderate level of physical activity, whereas 13 respondents (27.1%) were categorized as having a light level of physical activity. Regarding blood pressure, the majority of respondents (29 or 60.4%) were categorized as hypertensive, while 19 respondents (39.6%) were categorized as non hypertensive. These findings indicate that a larger proportion of respondents experienced hypertension compared to those who did'n

**Bivariate Analysis**

**Table 3 Bivariate Analysis**

| **Variabe** | **Hypertension** | | | | **Total** | | ***p-value*** |
|---|---|---|---|---|---|---|---|
| | yes | | No | | | | |
| | n | % | n | % | N | % | |
| **Good Diatery** | 2 | 4.1 | 9 | 18.8 | 11 | 100 | 0,003 |
| **Bad Dietary** | 27 | 56.2 | 10 | 20.8 | 37 | 100 | |
| **Light Activity** | 11 | 22.9 | 2 | 4.2 | 13 | 100 | 0,079 |
| **Medium Activity** | 18 | 37.5 | 17 | 35.4 | 35 | 100 | |

Based on the analysis of the table above, the results show that among respondents with a good diet, 2 (4.1%) had hypertension and 9 (18.8%) did not. Among respondents with a poor diet, 27 (56.2%) had hypertension and 10 (20.8%) did not. These results indicate that the majority of respondents in this study had a poor diet and suffered from hypertension. The analysis also yielded an Odds Ratio (OR) of 0.082 with a 95% Confidence Interval (CI) of 0.015–0.448. This OR value indicates that respondents with a good diet had 0.082 times the odds of developing hypertension compared to those with a poor diet. Furthermore, the 95% CI range did not include the value of 1, suggesting that the OR estimate supports the existence of a significant association between diet and the incidence of hypertension. A p-value of 0.003 was obtained ($p < \alpha$ 0.05), indicating a significant relationship between diet and the incidence of hypertension among Nasi

Kapau vendors at Benteng Pasar Atas, Bukittinggi City, in 2026. The significant association between dietary patterns and hypertension may be related to the dietary environment of Nasi Kapau vendors, who have frequent access to foods prepared with relatively high amounts of fat and sodium. However, this finding should be interpreted within the context of the cross-sectional design, which does not establish causality. The result is consistent with previous studies reporting an association between dietary patterns and hypertension, although differences in population characteristics and dietary assessment methods should be considered

Analysis of Table 3 shows that among respondents with light physical activity, 11 (22.9%) had hypertension and 2 (4.2%) did not. Among those with moderate physical activity, 18 (37.5%) had hypertension and 17 (35.4%) did not. These findings indicate that nearly half of the total respondents engaged in moderate physical activity and had hypertension. A p value of 0.079 was obtained ($p > \alpha$ 0.05), indicating no significant relationship between physical activity and the incidence of hypertension among Nasi Kapau vendors at Benteng Pasar Atas, Bukittinggi City, in 2026.

**IMPLICATIONS**

The results of this study indicate that the majority of Nasi Kapau vendors at Benteng Pasar Atas, Bukittinggi City, have poor dietary habits (77.1%) and suffer from hypertension (60.4%). Meanwhile, most respondents engage in moderate levels of physical activity (72.9%). Bivariate analysis reveals a significant association between dietary habits and the incidence of hypertension (p=0.003; OR=0.082; 95% CI=0.015–0.448), Respondents with a good dietary pattern had lower odds of being classified as hypertensive compared with those with a poor dietary pattern (OR = 0.082; 95% CI: 0.015–0.448; p = 0.003). whereas physical activity shows no significant association with hypertension (p=0.079). This finding should be interpreted cautiously because most respondents were concentrated in the moderate physical activity category, while no respondents were classified as having vigorous physical activity. The relatively homogeneous distribution of physical activity levels and the small sample size may have limited the ability to detect a statistically significant association. These findings suggest that improving dietary habits specifically by limiting the intake of high fat and high sodium foods, increasing vegetable and fruit consumption, and undergoing regular blood pressure checksis crucial for the prevention and control of hypertension among Nasi Kapau vendors.

**RESEARCH CONTRIBUTION**

This study contributes theoretically to the field of public health by strengthening empirical evidence regarding the link between dietary patterns, physical activity, and the incidence of hypertension among informal sector workers. The results indicate a significant association between dietary patterns and hypertension, whereas physical activity did not show a significant relationship. These findings enrich the understanding of behavioral factors associated with hypertension, particularly among food vendors who operate in unique work environments and have distinct dietary habits. Furthermore, the study's results can serve as a reference for future research examining behavioral and other factors linked to hypertension within informal worker groups. From a practical standpoint, these findings can inform health professionals and local government officials in developing health promotion and hypertension prevention strategies for Nasi Kapau vendors at Benteng Pasar Atas in Bukittinggi City. Interventions could focus on educating vendors about healthy eating specifically limiting the intake of high fat and high sodium

foods while increasing vegetable and fruit consumption. Additionally, regular blood pressure screenings could be implemented as part of early detection and hypertension control efforts. For the vendors, the study results provide a basis for raising awareness about adopting healthier diets and maintaining long term health. For future researchers, these findings offer a foundation for investigating other potential factors associated with hypertension, such as age, family history, body mass index (BMI), smoking, stress, and sleep quality.

**LIMITATIONS**

This study has several limitations. First, the cross-sectional design does not allow causal relationships to be established between dietary patterns, physical activity, and hypertension. Second, dietary and physical activity data were collected using self-reported questionnaires, particularly the SQ-FFQ and IPAQ, which may be subject to recall and reporting bias. Third, the relatively small sample size and the absence of respondents in the vigorous physical activity category may have limited the statistical power to detect an association between physical activity and hypertension. Future studies involving larger samples and longitudinal or intervention designs are recommended to further examine these relationshi

**SUGGESTIONS**

Recommendations from this study are addressed to relevant stakeholders to help reduce the incidence of hypertension. Nasi kapau vendors are advised to adopt a balanced diet by limiting salt, coconut milk, and saturated fats, engaging in regular physical activity for at least 30 minutes daily, and undergoing periodic blood pressure checks. Future research should aim to expand the sample size, utilize cohort or intervention study designs, and explore additional variables such as stress levels, sleep quality, and nutritional status. Meanwhile, the Health Office, relevant agencies, and the Bukittinggi City Government are expected to collaborate in strengthening health promotion and prevention efforts through sustained nutrition education and the provision of easily accessible blood pressure screening services within the market area.

**CONCLUSION**

This study found a statistically significant association between dietary patterns and hypertension status among Nasi Kapau vendors at Benteng Pasar Atas, Bukittinggi City. In contrast, no statistically significant association was found between physical activity and hypertension status. Because of the cross-sectional design, these findings should be interpreted as associations rather than causal relationships. Health promotion efforts may focus on encouraging healthier dietary practices and regular blood pressure monitoring among Nasi Kapau vendors.

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