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ANALYSIS OF RISK FACTORS FOR HYPERTENSION IN BONTO TALLASA VILLAGE, ULUERE DISTRICT, BANTAENG REGENCY

ANALISIS FAKTOR RISIKO KEJADIAN HIPERTENSI DI DESA BONTO TALLASA KECAMATAN ULUERE KABUPATEN BANTAENG

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Abstrak

This study aimed to identify risk factors associated with hypertension in Bonto Tallasa Village, Uluere Subdistrict, Bantaeng Regency, in 2025. The research examined three factors: family history, excessive sodium intake, and stress. A quantitative case–control design was applied to 60 respondents (30 cases and 30 controls) selected through purposive sampling. The results showed that individuals with a family history of hypertension were about 26 times more likely to develop hypertension than those without such a history, indicating a strong and significant association. Excessive sodium intake increased the risk approximately 3.5 times and was statistically significant. Stress was associated with nearly double the risk, but this association was not statistically significant, possibly due to individual differences in coping mechanisms and measurement limitations of subjective stress levels. This suggests that stress may influence hypertension indirectly through behavioral or physiological pathways. In conclusion, family history and excessive sodium intake are significant predictors of hypertension, while stress contributes to an elevated yet statistically nonsignificant risk. Preventive strategies should emphasize sodium reduction, regular blood pressure monitoring, and effective stress management in daily life.

Keywords: hypertension, risk factors, family history, sodium intake, stress

Abstrak

Penelitian ini bertujuan untuk mengidentifikasi faktor-faktor risiko yang berhubungan dengan hipertensi di Desa Bonto Tallasa, Kecamatan Uluere, Kabupaten Bantaeng, pada tahun 2025. Penelitian ini menelaah tiga faktor utama, yaitu riwayat keluarga, asupan natrium berlebih, dan stres. Desain penelitian yang digunakan adalah kuantitatif dengan pendekatan kasus–kontrol,

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melibatkan 60 responden (30 kasus dan 30 kontrol) yang dipilih secara purposive. Hasil penelitian menunjukkan bahwa individu dengan riwayat keluarga hipertensi memiliki kemungkinan sekitar 26 kali lebih besar menderita hipertensi dibandingkan dengan mereka yang tidak memiliki riwayat tersebut, menunjukkan hubungan yang kuat dan signifikan. Asupan natrium berlebih meningkatkan risiko sekitar 3,5 kali dan signifikan secara statistik. Stres meningkatkan risiko hampir dua kali lipat, namun tidak signifikan secara statistik, kemungkinan karena perbedaan kemampuan individu dalam menghadapi stres serta keterbatasan dalam pengukuran tingkat stres yang bersifat subjektif. Hal ini menunjukkan bahwa stres dapat berpengaruh secara tidak langsung melalui mekanisme perilaku atau fisiologis. Kesimpulannya, riwayat keluarga dan asupan natrium berlebih merupakan prediktor signifikan hipertensi, sedangkan stres berkontribusi terhadap peningkatan risiko yang tidak signifikan secara statistik. Upaya pencegahan perlu difokuskan pada pengurangan konsumsi natrium, pemantauan tekanan darah secara rutin, dan pengelolaan stres yang efektif dalam kehidupan sehari-hari.

Kata Kunci: hipertensi, faktor risiko, riwayat keluarga, asupan natrium, stres

1. INTRODUCTION

Hypertension remains a major global health challenge, affecting over 1.4 billion adults aged 30–79, with fewer than 20% achieving adequate control. Uncontrolled blood pressure is a leading risk factor for heart attack, stroke, chronic kidney disease, and dementia. This widespread prevalence highlights persistent gaps in awareness, prevention, and management. Hypertension also imposes significant economic burdens on individuals, families, healthcare systems, and national economies, especially in low- and middle-income countries, where cardiovascular diseases have caused estimated losses of US$3.7 trillion from 2011 to 2025. Despite the potential for substantial healthcare savings, investment and commitment to hypertension control remain insufficient. The burden is expected to rise as populations age and life expectancy increases. Urgent public health actions are needed to strengthen prevention, treatment, and control strategies globally (World Health Organization, 2025).

Previous research on the “Effectiveness of Non-Pharmacological Therapy through a Surveillance Approach to Lowering Blood Pressure in Patients with Primary Hypertension, Indonesia” revealed that excessive salt and caffeine consumption, as well as unmanaged stress, are significant contributors to hypertension. The study emphasized that lifestyle modification—such as reducing sodium and caffeine intake, engaging in regular physical activity, maintaining a healthy weight, and adopting stress management techniques like relaxation therapy, meditation, or breathing exercises—can effectively reduce blood pressure among hypertensive individuals (Masriadi et al., 2018). These findings support the importance of non-pharmacological interventions as complementary strategies alongside pharmacological treatment in hypertension management.

In Indonesia, hypertension remains a major public health issue, with an estimated prevalence of 36%. National Basic Health Research (Riskesdas, 2019) reported a prevalence of 34.1%, accounting for approximately 63 million cases and more than 427,000 deaths. The highest prevalence was observed in South Kalimantan (44.1%), while the lowest was in Papua (22.2%). Data from the Ministry of Health and regional health offices indicate that the burden of hypertension continues to rise each year.

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In South Sulawesi Province, hypertension was identified as the most prevalent NCD, with 4,256,307 cases recorded in 2023 (South Sulawesi Provincial Health Office, 2023). In Bantaeng Regency alone, 45,832 hypertension cases were reported, with a Hypertension Minimum Service Standard (SPM) rate of 81.56%. In 2024, hypertension remained the most frequently reported disease, accounting for 11,492 cases, including both inpatient and outpatient visits (Bantaeng Regency Health Office, 2024).

Desa Bonto Tallasa, located in Uluere Subdistrict, Bantaeng Regency, was chosen as the research site because it represents a semi-rural area where community lifestyle, such as high salt consumption, limited access to health education, and elevated stress due to socioeconomic factors, may contribute to the high incidence of hypertension. Moreover, limited implementation of non-pharmacological interventions in this area underscores the need for localized research.

This study contributes to the understanding of hypertension risk factors at the community level and provides evidence to support public health strategies that promote behavioral modification and community-based hypertension control. The findings are expected to assist local and national health policymakers in designing more effective prevention programs and integrating non-pharmacological approaches into primary health care services in Indonesia.

2. RESEARCH METHOD

This study employed a quantitative research design using a case–control approach. The design was selected because it is suitable for identifying and comparing risk factors between individuals diagnosed with a disease (cases) and those without the disease (controls). The case–control method allows efficient examination of multiple risk factors associated with hypertension, particularly when investigating relatively common community health problems, while minimizing time and resource constraints compared to longitudinal studies.

The study was conducted in Bonto Tallasa Village, Uluere District, Bantaeng Regency, South Sulawesi Province. The village was chosen because it represents a highland rural community with a relatively large population and a high reported prevalence of hypertension. Data collection was carried out from April to June 2025.

The study population consisted of all residents of Bonto Tallasa Village who met the inclusion criteria, namely individuals aged 30 years and older who had been diagnosed with hypertension at least once during the previous year according to medical records from the Loka Community Health Center, totaling 144 individuals. The sample was selected using a non-probability purposive sampling technique based on predetermined inclusion and exclusion criteria. The final sample comprised 60 respondents, divided into two equal groups: 30 hypertensive cases and 30 non-hypertensive controls, resulting in a 1:1 matching ratio. The sample size was determined based on considerations of feasibility, population distribution, and adequacy for bivariate statistical analysis using the Odds Ratio test, which is commonly applied in case–control studies with a minimum of 30 subjects per group to achieve sufficient statistical power.

Data were collected through direct interviews and physical measurements. The research instruments included:

a. Questionnaire - used to obtain demographic data and information on risk factors such as family history, sodium intake, and stress levels.

b. Sphygmomanometer and stethoscope - used to measure blood pressure following the standard procedures recommended by the Indonesian Ministry of Health.

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c. Stress Assessment Scale – adapted from the "Perceived Stress Scale (PSS)", which categorizes respondents into low, moderate, and high-stress levels.
d. Food Frequency Questionnaire (FFQ) – utilized to assess sodium intake frequency and portion sizes, validated by prior studies in Indonesian populations.

Data analysis was conducted using univariate and bivariate techniques. The Chi-Square test was applied to determine the association between independent variables (family history, sodium consumption, stress) and the dependent variable (hypertension status). The Odds Ratio (OR) was calculated to estimate the strength of association between each risk factor and the occurrence of hypertension.

The case–control approach was deemed appropriate for this study because it efficiently identifies relationships between multiple risk factors and disease occurrence in a relatively short time, especially for community-level studies where cohort designs would be less feasible due to limited resources and extended observation periods.

3. RESULTS AND DISCUSSION

Table 1. Distribution of Respondents by Characteristics in the Case and Control Groups, Bonto Tallasa Village, Uluere District, Bantaeng Regency

Respondents' Characteristics	Case Group		Control Group		Total
	f	%	f	%	
Age (Years)					
< 40	1	3.3	4	13.3	5
41 - 45	10	33.3	16	53.3	26
46 - 50	3	10.0	3	10.0	6
51 - 55	3	10.0	3	10.0	6
56 - 60	2	10.0	1	3.3	3
>60	11	36.7	3	10.0	14
Gender					
Male	3	10.0	6	20.0	9
Female	27	90.0	24	80.0	51
Occupation					
Housewife	24	80.0	20	66.7	44
Informal sector (Farmer/Trader/Self-employed)	6	20.0	8	26.7	14
Formal sector (Civil Servant)	0	0	2	6.7	2
Education					
Did not complete elementary school	18	60.0	10	33.3	28
Completed elementary school	11	36.7	14	46.7	25
Junior high school	1	3.3	2	6.7	3
≥ Senior high school	0	0	4	13.3	4
Medical History					
No Medical History	3	10.0	22	73.3	25
Has Medical History	27	90.0	8	26.7	35
Hypertension Examination History					
Never	9	30.0	13	43.3	22
Ever	21	70.0	17	56.7	38
Total	30	100.0	30	100.0	60

Source: Primary Data, 2025

This section describes the sociodemographic and health-related characteristics of participants in both the case and control groups, as summarized in Table 1. The age distribution

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indicates that most individuals in the case group were older than 60 years (36.7%), whereas the majority in the control group were aged 41–45 years (53.3%). In terms of gender, females predominated in both groups, accounting for 90% in the case group and 80% in the control group. Regarding blood pressure, half of the participants in each group had levels above 140/90 mmHg, while the remaining half had levels below that threshold. With respect to occupation, most individuals in the case group were housewives (80%), compared with 66.7% in the control group. Educational attainment also varied: 60% of the case group had not completed elementary school, whereas 46.7% of the control group had completed elementary education.

A notable difference was observed in medical history. In the case group, 90% reported having a history of illness, compared with only 26.7% in the control group. Conversely, 73.3% of those in the control group reported no prior illness, compared with 10% in the case group. Both groups had undergone hypertension examinations. A higher proportion of the case group (70%) had previously been screened for hypertension compared with 56.7% in the control group. Meanwhile, a larger proportion of the control group (43.3%) had never undergone such examinations compared with 30% in the case group.

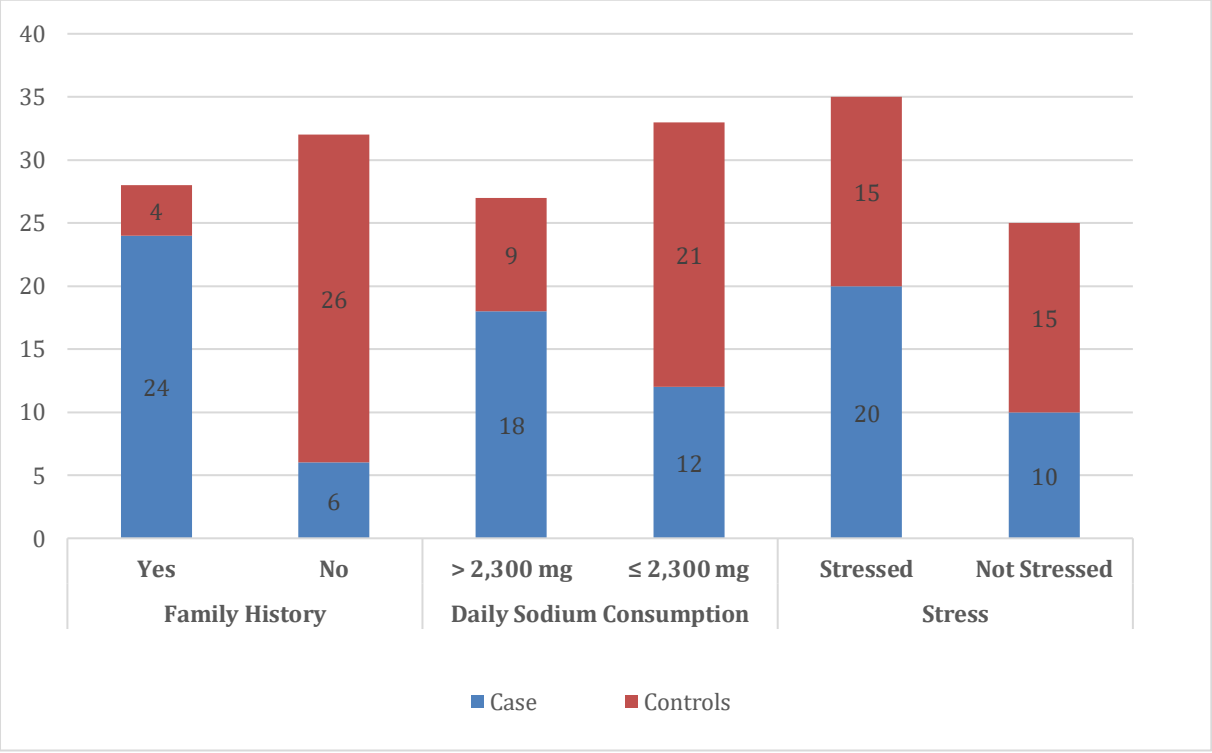

Figure 1. Distribution of Respondents Based on Family History, Sodium Intake, and Stress in Bonto Tallasa Village, Uluere District, Bantaeng Regency

The data presented in Figure 1 illustrate the distribution of hypertension cases and the control group based on family history, sodium intake, and stress levels in Bonto Tallasa Village, Uluere District, Bantaeng Regency. A substantial proportion of hypertensive respondents (24 out of 30; 80%) reported a positive family history, compared to only 4 out of 30 (13.3%) in the control group, indicating that genetic predisposition plays a major role in the occurrence of hypertension within this population.

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Regarding sodium intake, 18 cases (60%) consumed more than 2,300 mg per day, whereas only 9 controls (30%) exceeded this level, suggesting that excessive sodium consumption may act as an important environmental contributor to hypertension, although its effect is less pronounced than genetic factors. Stress levels were reported by 20 hypertensive respondents (66.7%) compared to 15 controls (50%), indicating that psychological stress may also contribute to hypertension, albeit with a less clear influence in this study.

Table 2. Risk Factors Associated with Family History, Sodium Consumption, and Stress in Relation to Hypertension in Bonto Tallasa Village, Uluere District, Bantaeng Regency

Research Variables	Hipertensi				OR 95% CI	*p*-Value
	Case Group		Control Group			
	f	%	f	%		
Family History					26.0 (6.532 – 103.498)	0.000
Yes	24	80.0	4	13.3		
No	6	20.0	26	86.7		
Sodium Consumption					3.5 (1.201 – 10.196)	0.020
>2,300 mg/day	18	60.0	9	30.0		
≤2,300 mg/day	12	40.0	21	70.0		
Stress					2.0 (0.705 – 5.677)	0.295
Stressed	20	66.7	15	50.0		
Not Stressed	10	33.3	15	50.0		

Source: Primary Data, 2025

Table 2 shows that respondents with a family history of hypertension were more prevalent in the case group (80%) compared to the control group (13.3%). Chi-square analysis indicated a significant association between family history and hypertension ($p < 0.001$). The odds ratio (OR) demonstrated that respondents with a family history of hypertension were 26 times more likely to develop hypertension than those without a family history (95% CI: 6.532–103.498). Regarding daily sodium intake, the majority of the case group consumed >2,300 mg per day (60%), whereas most of the control group consumed ≤2,300 mg per day (70%). The odds ratio showed that respondents consuming more than 2,300 mg of sodium per day had a 3.5-fold higher risk of hypertension compared to those consuming less (OR = 3.50; 95% CI: 1.201–10.196; $p = 0.020$), indicating a statistically significant association.

The proportion of respondents experiencing stress was higher in the case group (66.7%) than in the control group (50%). Although the odds ratio suggested that stress increased the risk of hypertension by two times (OR = 2; 95% CI: 0.705–5.677), this association was not statistically significant ($p = 0.295$).

Discussion

The demographic characteristics of the study population provide important insights into the social and biological determinants of hypertension in rural settings. This study found that older adults, particularly those above 60 years, had a higher prevalence of hypertension. This finding aligns with prior research indicating that aging contributes to vascular stiffening, which reduces arterial elasticity and elevates blood pressure (Marlita et al., 2022; Hasmah et al., 2021;

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Purwono et al., 2020). Thus, age represents a significant non-modifiable risk factor for hypertension.

Gender differences in hypertension were also observed, with females exhibiting a higher prevalence than males, a disparity partly attributable to hormonal changes, particularly post-menopause, when decreased estrogen levels reduce cardiovascular protection. Estrogen is known to enhance HDL-cholesterol levels and confer protection against atherosclerosis and its post-menopausal decline removes this protective effect, predisposing women to elevated blood pressure (Ardiani et al., 2013; Ferreira Campos et al., 2024). In addition, women in rural settings often assume the role of housewives, which may expose them to psychosocial stress, suboptimal dietary patterns, and reduced physical activity, further increasing their risk of hypertension.

Educational attainment is a critical determinant of hypertension risk. Individuals with lower education, particularly those who have not completed primary school, demonstrate higher hypertension prevalence (Maria et al., 2022). Limited educational background often results in inadequate knowledge of healthy dietary practices, including reduced salt and fat intake, and the importance of regular health screenings. Moreover, low education frequently coincides with lower socioeconomic status, restricting access to healthcare services and health-promoting resources. Such limitations can contribute to unhealthy lifestyle behaviors that exacerbate hypertension risk. Recent evidence indicates that targeted health education interventions can significantly improve knowledge, attitudes, and self-management practices regarding hypertension, especially among low-education populations (Iftita & Muthoharoh, 2024; Prastiwi et al., 2023). By enhancing awareness and promoting preventive behaviors, education functions as both a direct and indirect factor in controlling blood pressure. Therefore, addressing educational disparities is essential for reducing hypertension prevalence and improving cardiovascular health outcomes in vulnerable groups.

Occupational factors also play a significant role in hypertension development. Sedentary occupations, such as homemaking, are associated with higher hypertension risk due to low physical activity and increased psychosocial stress (Hasanah et al., 2024). In contrast, occupations requiring moderate to high physical activity, such as agricultural work or trading, tend to reduce hypertension prevalence through increased energy expenditure and cardiovascular fitness (Pratama & Yeni, 2023). Work-related stress, including workload and job insecurity, can further exacerbate blood pressure elevation in sedentary occupations. Therefore, understanding the interaction between occupational activity and stress is crucial for public health strategies targeting hypertension prevention. Interventions focusing on both education and occupation-related risk factors are likely to be most effective in controlling hypertension at the population level.

Medical history further influenced hypertension risk. Respondents with pre-existing chronic conditions, including diabetes mellitus and cardiovascular disease, were more likely to develop hypertension, corroborating findings from Rediningsih and Lestari (2022). Comorbidities exacerbate cardiovascular strain, emphasizing the need for integrated prevention strategies targeting individuals with chronic illnesses.

The study conducted by Suciana et al. (2024) revealed significant gaps in public awareness related to blood pressure monitoring. The findings showed that many respondents rarely or never measured their blood pressure, indicating a limited understanding of hypertension as a “silent killer.” This gap is compounded in rural areas by restricted access to

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healthcare, low education, and the perception that hypertension is non-critical (Kementerian Kesehatan RI, 2019).

Most hypertensive respondents in this study fell within stage I–II categories based on WHO (2025) criteria (systolic ≥140 mmHg and/or diastolic ≥90 mmHg). Chronic elevation of blood pressure increases cardiac workload and damages vascular integrity, heightening the risk of stroke, kidney failure, and coronary artery disease (Marlita et al., 2022). Hypertension in this population was influenced by multiple factors, including hereditary history, excessive sodium intake, stress, unhealthy diet, and low physical activity (Purwono et al., 2020; Ridho et al., 2021).

Consistent with previous research, family history emerged as a strong non-modifiable risk factor. Individuals with a familial history of hypertension had a 26-fold higher risk compared to those without such a history, reflecting the genetic predisposition underlying blood pressure regulation (Buntaa et al., 2019). Age and comorbidities, such as diabetes mellitus, further amplified this risk, highlighting the interaction between non-modifiable and modifiable factors.

Excessive sodium consumption was confirmed as a modifiable risk factor. Respondents consuming >2,300 mg/day exhibited a 3.5-fold higher risk of hypertension. Interestingly, hypertensive respondents tended to adhere to lower-sodium diets, likely due to prior diagnosis and dietary counseling, whereas many controls exceeded recommended limits unknowingly. This aligns with findings from Siregar et al. (2020), which identified high sodium intake, particularly from salted seafood and processed foods, as a key contributor to hypertension in coastal populations. Physiologically, excess sodium increases blood volume, cardiac output, and arterial pressure, thereby elevating blood pressure.

The analysis of stress revealed a nuanced picture. Although stress appeared to double the risk of hypertension, this association was not statistically significant (OR = 2; 95% CI: 0.705–5.677; p=0.295). The lack of statistical significance may be attributed to the multifactorial etiology of hypertension, where stronger determinants such as family history and sodium intake could overshadow the effect of stress. Moreover, the heterogeneity in stress perception and individual coping mechanisms among respondents may have contributed to the attenuated association, as not all individuals respond physiologically to stress in the same manner (Spruill, 2010).

Previous studies have shown that psychological stress can influence blood pressure through activation of the hypothalamic-pituitary-adrenal (HPA) axis and sympathetic nervous system, leading to increased cortisol levels, vascular reactivity, and heart rate variability (Chida & Steptoe, 2010; Landsbergis et al., 2013). However, the magnitude of this effect can be highly variable depending on personal resilience, social support, and concurrent lifestyle factors such as diet, physical activity, and sleep patterns (Sparrenberger et al., 2009). In line with this, Masriadi et al. (2018) reported that while stress impacts blood pressure, its effect may be moderated by dietary habits, physical activity, and other lifestyle behaviors, potentially explaining why associations observed in cross-sectional studies often fail to reach statistical significance.

Additionally, measurement limitations could play a role. Stress is inherently subjective and dynamic, and single-point assessments may not accurately capture chronic or cumulative stress exposure, which has been shown to have stronger links to hypertension (Brunner et al., 2002). This highlights the need for longitudinal or mixed-method studies to better elucidate the temporal relationship between stress and hypertension, as well as to account for moderating

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factors that may buffer or amplify its effects. Understanding these nuances is critical for designing interventions targeting stress management alongside other modifiable risk factors in community-based hypertension prevention programs.

Overall, these findings underscore the importance of a multifactorial approach to hypertension prevention. While non-modifiable factors such as age and genetics are important, modifiable lifestyle factors, sodium intake, physical activity, and stress management, remain critical intervention targets. Integrating educational programs, community health initiatives, and personalized counseling can help mitigate the impact of these risk factors in rural populations.

4. CONCLUSION

This study examined the key determinants of hypertension among the study population, focusing on genetic, dietary, and psychosocial factors. The findings indicate that individuals with a hereditary or genetic history of hypertension have a significantly higher likelihood—approximately 26 times greater—of developing hypertension compared to those without such a family history, suggesting that genetic predisposition is a strong determinant of hypertension risk. Excessive sodium intake was also found to be significantly associated with an increased risk of hypertension, as individuals who consumed sodium above the recommended daily limit were about 3.5 times more likely to develop hypertension than those with normal intake. This reinforces the importance of dietary modification, particularly salt reduction, as a preventive measure. Meanwhile, individuals experiencing stress showed approximately twice the risk of developing hypertension compared to those who were not stressed; however, this association was not statistically significant. This may be due to individual variations in physiological responses to stress, coping mechanisms, or environmental and social influences that modulate the effect of stress on blood pressure.

Collectively, these findings highlight the multifactorial nature of hypertension and underscore the need for integrated prevention strategies that address both genetic susceptibility and modifiable lifestyle factors. Future studies are recommended to employ longitudinal or mixed-method approaches to better explore the dynamic relationship between psychological stress, environmental influences, and hypertension risk. Such research could provide a deeper understanding of causal mechanisms and inform the development of community-based interventions that promote healthy behaviors and effective stress management.

5. REFERENCES

Ardiani, H., Saraswati, L. D., & Susanto, H. S. (2013). Risk Factors of Hypertension in Menopausal Women in Rejomulyo, Madiun. MJHR, Vol 19(2). https://scholarhub.ui.ac.id/mjhr/vol19/iss2/4/

Bantaeng Regency Health Office. (2024). Health Profile of Bantaeng Regency 2023. Bantaeng: Dinas Kesehatan Kabupaten Bantaeng.

Brunner, E.J., Hemingway, H., Walker, B.R., Page, M., Clarke, P., Juneja, M., ... & Marmot, M.G. (2002). Adrenocortical, autonomic, and inflammatory causes of the metabolic syndrome: Nested case-control study. Circulation, 106(21), 2659–2665. https://doi.org/10.1161/01.CIR.0000034443.07480.60

Buntaa, J. N., Ratag, B. T., & Nelwan, J. E. (2019). Faktor-Faktor Risiko Kejadian Hipertensi Nelayan di Desa Mala dan Mala Timur Kecamatan Melonguane Kabupaten Kepulauan

Multidisciplinary Indonesian Center Journal (MICJO)
Journal page is available to
https://e-jurnal.jurnalcenter.com/index.php/micjo
Email: admin@jurnalcenter.com

Talaud. Jurnal Kesehatan Masyarakat Universitas Sam Ratulangi, 7(4), 1–9. https://ejournal.unsrat.ac.id/index.php/kesmas/article/view/23154

Chida, Y., & Steptoe, A. (2010). The association of anger and hostility with future coronary heart disease: A meta-analytic review of prospective evidence. Journal of the American College of Cardiology, 56(11), 872–880. https://doi.org/10.1016/j.jacc.2010.03.003

Ferreira Campos, L., de Andrade Costa, G., Domingues Feitosa, M., … & Aquino, M. L. (2024). Effect of hormone therapy on blood pressure and hypertension in postmenopausal women: a systematic review and meta-analysis. Menopause, 31(6), 556-562. doi:10.1097/GME.0000000000002359

Hasanah, S. U., Effendy, D. S., & Yunawati, I. (2024). The relationship between physical activity and work-related stress with the occurrence of hypertension in the city of Kendari. Miracle Journal of Public Health, 7(1).

Hasmah, H., Syam, N. A., & Azis, R. (2021). Faktor Yang Hubungan Dengan Kejadian Hipertensi Di Rsud Kolonodale Kabupaten Morowali Utara. (Jurnal Ilmiah Mahasiswa Kesehatan Masyarakat), 6(1). https://doi.org/10.37887/jimkesmas.v6i1.16766

Iftita, M. A., & Muthoharoh, N. A. (2024). The impact of health education on the level of knowledge about hypertension and Posbindu. Health & Medical Sciences. https://doi.org/10.47134/phms.v2i1.277

Kementerian Kesehatan RI. (2019). Laporan Nasional Riset Kesehatan Dasar (Riskesdas) 2018. Jakarta: Badan Litbangkes Kemenkes RI. https://www.litbang.kemkes.go.id/laporan-riset-kesehatan-dasar-riskesdas-2018/

Landsbergis, P. A., Dobson, M., Koutsouras, G., & Schnall, P. (2013). Job strain and ambulatory blood pressure: A meta-analysis and systematic review. American Journal of Public Health, 103(3), e61–e71. https://doi.org/10.2105/AJPH.2012.300878

Marlita, M., Lestari, R. M., & Ningsih, F. (2022). Hubungan Gaya Hidup (Lifestyle) dengan Kejadian Hipertensi pada Usia Produktif. Jurnal Surya Medika, 8(2), 24–30. https://doi.org/10.33084/jsm.v8i2.3850

Maria, I. L., Yusnitasari, A. S., Lifoia, C., Annisa, A. T. A., & Mulyani, S. (2022). Determinants of hypertension incidence in the work areas of the Bone and Barru District Health Centers in 2022. Media Kesehatan Masyarakat Indonesia, 18(3).

Masriadi, Azis, R., Sumantri, E., & Mallongi, A. (2018). Effectiveness of non pharmacologic therapy through surveillance approach to blood pressure degradation in primary hypertension patients, Indonesia. Indian Journal of Public Health Research and Development. https://doi.org/10.5958/0976-5506.2018.00292.9

Prastiwi, F., Fitriyani, N., Budiman, A. A., & Rahmad, M. N. (2023). Education on hypertension prevention in the elderly. Jurnal Kreativitas Pengabdian Kepada Masyarakat, 6(10). https://ejurnalmalahayati.ac.id/index.php/kreativitas/article/view/12137

Pratama, S., & Yeni, Y. (2023). Physical activities of working communities during the COVID-19 pandemic with hypertension incidence in Indralaya District. Jurnal Ilmu Kesehatan Masyarakat, 14(2), 253–262.

Purwono, J., Sari, R., Ratnasari, A., & Budianto, A. (2020). Pola Konsumsi Garam dengan Kejadian Hipertensi pada Lansia. Jurnal Wacana Kesehatan, 5(1), 531. https://doi.org/10.52822/jwk.v5i1.120

Rediningsih, D., & Lestari, I. P. (2022). Riwayat Keluarga dan Hipertensi dengan Kejadian Diabetes Melitus Tipe II. Jurnal Penelitian dan Pengembangan Kesehatan Masyarakat Indonesia, 3(1), 8–13. https://journal.unnes.ac.id/sju/index.php/jppkmi/article/view/52087

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https://e-jurnal.jurnalcenter.com/index.php/micjo
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Ridho, M., Frethernety, A., & Widodo, T. (2021). Literature Review Hubungan Stres dengan Kejadian Hipertensi. Jurnal Kedokteran Universitas Palangka Raya, 9(2), 1366–1371. https://doi.org/10.37304/jkupr.v9i2.3571

Salman, Y., Sari, M., Libri, O. (2020). Analisis Faktor Dominan terhadap Kejadian Hipertensi pada Lansia di Puskesmas Cempaka. Jurnal Dunia Gizi, 3(1),15–22. https://ejournal.helvetia.ac.id/index.php/jdg/article/view/4640

Siregar, P. A., Simanjuntak, S. F. S., Ginting, F. H. B., Tarigan, S., Hanum, S., & Utami, F. S. (2020). Analisi Faktor Risiko Kejadian Hipertensi Masyarakat Pesisir Kota Medan (Aspek Sosial Budaya Masyarakat Pesisir). Jurnal Pembangunan Perkotaan, 8(1), 1–8.

Sparrenberger, F., Cichelero, F. B., Ascoli, A. R., & Moreira, L. B. (2009). Psychological stress and hypertension: A systematic review. Journal of Human Hypertension, 23(1), 12–19. https://doi.org/10.1038/jhh.2008.40

South Sulawesi Provincial Health Office (2023). Health Profile of South Sulawesi Province 2023. Makassar: Dinas Kesehatan Provinsi Sulawesi Selatan.

Spruill, T. M. (2010). Chronic psychosocial stress and hypertension. Current Hypertension Reports, 12(1), 10–16. https://doi.org/10.1007/s11906-009-0089-8

Suciana, F., Hidayati, I. N., & Daryani, D. (2024). Peningkatan Pengetahuan tentang Komplikasi Hipertensi Beserta Pencegahannya. Wasathon Jurnal Pengabdian Masyarakat, 2(02), 56–60. https://doi.org/10.61902/wasathon.v2i02.984

World Health Organization (2025). Global Report on Hypertension: Accelerating Progress Towards 2025 Targets. Geneva: WHO. https://www.who.int/publications/i/item/9789240115569