Jurnal Eduhealth
Volume 16, Number 03 2025 DOI 10.54209/eduhealth.v16i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

# The Relationship Between Hypertension and Blood Glucose Levels Among Police Officers Aged 30–60 Years at the Pasuruan Police Resort

Rency Angelika Herdiana[1], Titiek Sunaryati[2]
Universitas Wijaya Kusuma Surabaya

**Article Info**

**Keywords:**
Blood Glucose Levels,
Cross-sectional,
Fisher's Exact Test,
Hypertension,
Police

**ABSTRACT**

Hypertension and elevated blood glucose levels are two chronic conditions that are often found concurrently and are major risk factors for cardiovascular disease. Although the relationship between the two has been extensively studied, specific data within certain professional groups such as police officers remain limited. This study aimed to examine the relationship between hypertension and blood glucose levels among police officers aged 30–60 years at the Pasuruan Police Resort. The study employed a cross-sectional design with a quantitative approach. The sample consisted of 60 police officers selected using purposive sampling. Data were obtained through blood pressure measurements and random blood glucose tests, and then analyzed using the Chi-Square test and Fisher's Exact Test. The results showed that 83.3% of respondents had hypertension, and 13.3% of them had elevated blood glucose levels. Statistical analysis using Fisher's Exact Test revealed no significant relationship between hypertension and blood glucose levels (p = 0.330). It can therefore be concluded that there is no significant association between hypertension and blood glucose levels among police officers aged 30–60 years at the Pasuruan Police Resort. Further research is needed, taking into account other risk factors such as dietary patterns, physical activity, and family medical history.



**Corresponding Author:**
Rency Angelika Herdiana
Universitas Wijaya Kusuma Surabaya
Jawa Timur
rencyherdiana563@gmail.com

## INTRODUCTION

Hypertension is characterized by a systolic blood pressure greater than 140 mmHg and a diastolic pressure above 90 mmHg, which can be diagnosed through repeated blood pressure measurements (Tiara, 2020). Hypertension is a common disease not only in Indonesia but also globally. The causes of hypertension range from genetic factors to individual lifestyle and behavior (Surayitno et al., 2020).

Blood glucose is one of the factors that can influence fluctuations in blood pressure (Julianti et al., 2021). In food, blood glucose is often found in the form of disaccharides or bound to other molecules. Blood glucose level, also known as blood sugar level, typically ranges from 75 to 115 mg/dL in individuals without diabetes mellitus. Throughout the day, blood glucose levels generally fluctuate between 70 and 150 mg/dL. After eating, these levels

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increase and are usually at their lowest in the morning before food intake. Both endogenous and exogenous factors influence blood glucose levels. Endogenous factors include insulin, glycogen, cortisol, and receptor systems in muscle and liver cells, while exogenous factors involve the types of food consumed and physical activity (Alydrus et al., 2022).

Measurement results indicate that the prevalence of hypertension among individuals under the age of 18 in Indonesia increased to 34.1%, up from 25.8% in 2013. In Indonesia, only one-third of hypertension cases are diagnosed, while the remainder go untreated (Moonti et al., 2023). According to WHO (2019), the American Region has the lowest prevalence of hypertension at 18%, whereas the African Region has the highest at 27%. A recent trend analysis showed that the adult population with hypertension increased from 594 million in 1975 to 1.13 billion in 2015. The majority of adults with hypertension live in low- and middle-income countries (Moonti et al., 2023). The World Health Organization (2022) reported that 22% of the global population suffers from hypertension. In Indonesia, the prevalence of hypertension increased by 8.31%, from 25.8% in 2013 to 34.11% in 2018 (Moonti et al., 2023).

This study aims to explore "The Relationship Between Hypertension and Blood Glucose Levels," as hypertension and elevated blood glucose (diabetes) are among the most common chronic diseases both in Indonesia and worldwide. Many individuals with hypertension also suffer from blood glucose irregularities, and this study provides insight into how these two conditions interact and impact overall health. Hypertension and diabetes share similar risk factors, such as poor diet, lack of physical activity, and obesity. Understanding both conditions can support more effective prevention and disease management strategies (Gultom et al., 2023).

Blood glucose levels and diabetes are often linked with hypertension. For example, hypertension-induced damage to blood vessels can impair blood flow to the pancreas, reducing the ability of pancreatic beta cells to produce insulin. Both hypertension and insulin resistance can damage endothelial function, reducing nitric oxide (NO) production. NO deficiency contributes to insulin resistance. High blood pressure also leads to oxidative stress, which further increases insulin resistance. Moreover, hypertension activates the Renin-Angiotensin-Aldosterone System (RAAS), particularly RAAS II, which inhibits insulin action in muscles and adipose tissue. Increased RAAS activity also promotes gluconeogenesis in the liver, raising blood glucose levels (Gultom et al., 2023).

Additionally, hypertension can result in decreased physical activity and cardiovascular complications. Increased blood pressure places excessive stress on the heart and blood vessels, leading to arterial damage and heart failure. Consequently, reduced physical activity, fatigue, loss of energy, and shortness of breath are common effects of chronic hypertension (Nurhikmawati et al., 2024).

Previous research by Khaerani et al. found a correlation between blood pressure and blood glucose levels in patients with type 2 diabetes mellitus. Therefore, patients should manage both conditions within normal thresholds. Proper control of blood glucose levels can also help regulate blood pressure (Hafid Khaerani et al., 2022).

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The general objective of this study is to examine the relationship between hypertension and blood glucose levels among police officers aged 30–60 years at the Pasuruan Police Resort. The specific objectives are: (1) to determine the blood pressure status of police officers aged 30–60 years with hypertension at the Pasuruan Police Resort; and (2) to assess the blood glucose levels of hypertensive police officers within the same age group at the same location.

## RESEARCH METHOD

This study employed a quantitative approach using a cross-sectional correlational analytical design. The research was conducted to determine the relationship between hypertension and blood glucose levels among police officers aged 30–60 years at the Pasuruan Police Resort. It was an observational study, where data were collected without any intervention on the subjects. The study took place at the Pasuruan Police Resort, located in Panggungrejo Subdistrict, Pasuruan City, East Java, in January 2025. The population consisted of all active police officers aged 30–60 years.

Inclusion criteria included police officers who agreed to participate by signing informed consent, were present during the examination, and were able to follow the study procedures. Respondents who were in unstable health conditions or had other chronic illnesses such as chronic kidney disease were excluded from the sample. The sampling technique used was purposive sampling, with a total of 60 respondents.

The independent variable in this study was hypertension, while the dependent variable was blood glucose level. Blood pressure was measured using a sphygmomanometer, and random blood glucose levels were measured using a glucometer. Operational definitions for each variable were based on criteria established in reputable medical references. Data processing involved bivariate statistical analysis using the Chi-Square test; however, due to the presence of cells with expected counts less than 5, Fisher's Exact Test was used as an alternative. All data were processed using SPSS software version 22.0.

The hypothesis proposed in this study was: there is a relationship between hypertension and blood glucose levels among police officers aged 30–60 years at the Pasuruan Police Resort. The research procedure included the following stages: obtaining permissions, subject recruitment, measurement of blood pressure and random blood glucose levels, data processing (editing, coding, data entry, tabulating, and statistical analysis), and systematic reporting of the research findings.

## RESULT AND DISCUSSION

### Result

This study was conducted to determine the relationship between hypertension and blood glucose levels among police officers aged 30–60 years at the Pasuruan Police Resort. The research was carried out at the Pasuruan Police Resort, with data collection taking place on March 10, 2025, involving a total of 60 respondents.

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## Respondent Characteristics

Based on the research conducted on 60 respondents at the Pasuruan Police Resort, the characteristics of the respondents in this study include age, gender, and occupation.

**Table 1.** Frequency Distribution of Respondents by Age, Gender, and Occupation (n=60)

| Characteristics | Frequency Respondents (n) | Percentage (%) |
|---|---|---|
| Ages 30 Yeasr | 3 | 5.0% |
| 31-40 Years | 24 | 40.1% |
| 41-50 Years | 14 | 23.3% |
| 51-60 Years | 19 | 31.7% |
| Total | 60 | 100% |
| Jenis Kelamin Male | 43 | 71.7% |
| Female | 17 | 28.3% |
| Total | 60 | 100% |

Based on Table 1, the respondent characteristics show that the majority of hypertension cases occurred in the 31–40 year age group, with 24 respondents (40%). Most respondents were male, totaling 43 (71.1%), while female respondents accounted for 17 (28.3%).

## Blood Pressure

The frequency distribution based on blood pressure is as follows:

**Table 2.** Frequency Distribution Based on Blood Pressure (n=60)

| Blood Pressure | Frequency (n) | Percentage (%) |
|---|---|---|
| Hypertension | 50 | 83.3% |
| Normotensive/Non-hypertensive | 10 | 16.7% |
| Total | 60 | 100% |

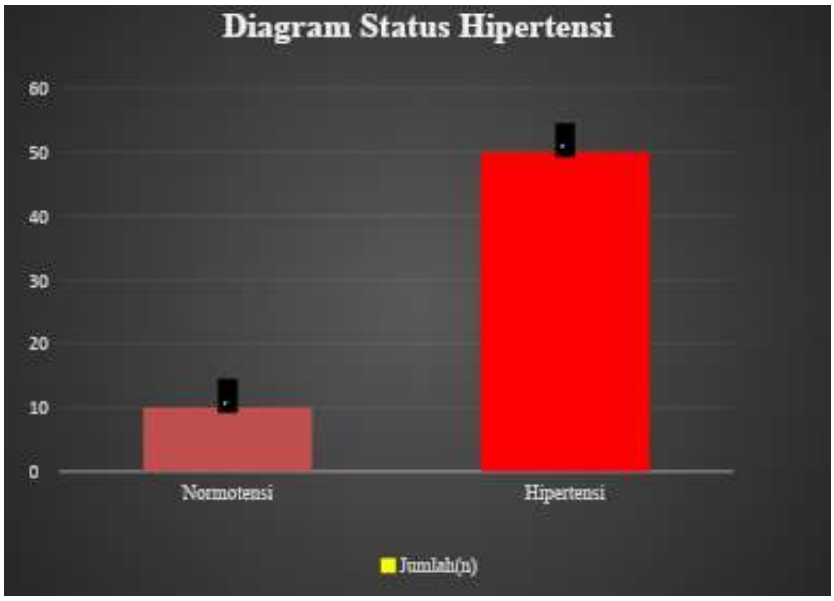


**Figure 1.** Hypertension Status Diagram

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Based on Table 2, the frequency distribution of blood pressure shows that 50 respondents (83.3%) were categorized as having hypertension, while 10 respondents (16.7%) were classified as non-hypertensive (normotensive).

**Blood Glucose**

The frequency distribution of blood glucose among respondents with hypertension is as follows:

**Table 3**. Frequency Distribution of Blood Glucose Among Respondents with Hypertension (n=60)

| Blood Glucose | Frequency (n) | Percentage (%) |
|---|---|---|
| Normo | 52 | 86.7% |
| Diabetes | 8 | 13.3% |
| Total | 60 | 100% |


**Figure 2.** Blood Glucose Diagram of Members

Based on Table 3, it was found that the majority of blood glucose levels among respondents with hypertension were in the normal range (normoglycemia), accounting for 52 respondents (86.7%). Meanwhile, 8 respondents (13.3%) with hypertension were found to have diabetes.

**Data Analysis**

The Relationship Between Hypertension and Blood Glucose Levels Among Police Officers Aged 30–60 Years at Pasuruan Police Resort in 2025

**Table 4.** Relationship between Hypertension and Blood Glucose Levels

| Blood Glucose | Hypertension | | Not Hypertensive | | Pvalue |
|---|---|---|---|---|---|
| Normo | 42 | 70.0% | 10 | 16.70% | 0.330 |
| Diabetes | 8 | 13.3% | 0 | 0.00% | |
| Total | 50 | 0.833 | 10 | 16.70% | |

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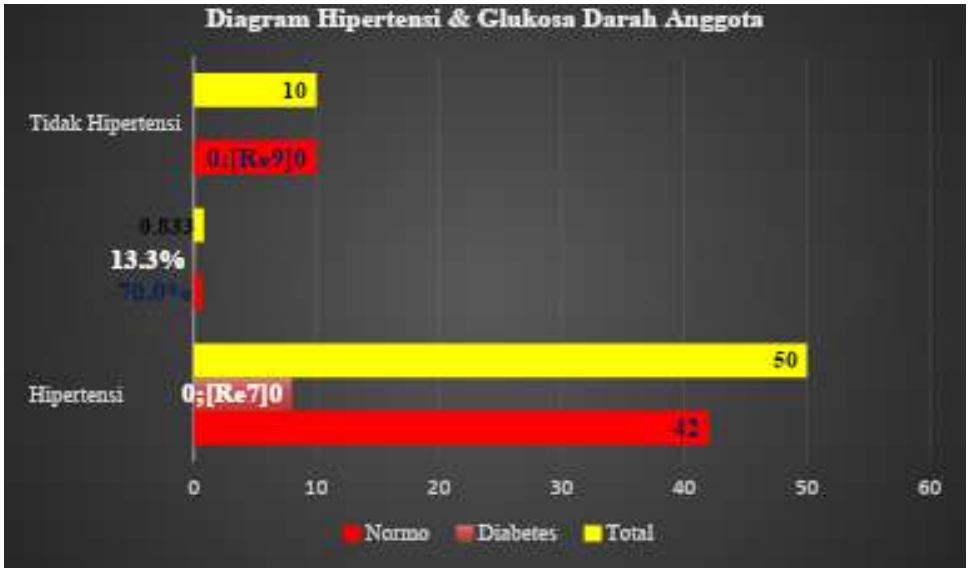


**Figure 3**. Diagram of Hypertension & Blood Glucose of Members

Based on Table 4 above, out of 60 respondents, 42 police officers (70%) were classified as hypertensive with normal blood glucose levels (normoglycemia), while 8 hypertensive respondents (13.3%) were found to have diabetes. Among the 60 respondents, 10 non-hypertensive respondents (16.7%) had normal blood glucose levels. There were no respondents, male or female, who were normotensive and had diabetes.

**Table 5**. Chi Square Test

| | Value | df | Asymp. Sig. (2-sided) |
|---|---|---|---|
| Pearson Chi-Square | 1.846[a] | 1 | .174 |
| Continuity Correction[b] | .721 | 1 | .396 |
| Likelihood Ratio | 3.154 | 1 | .076 |
| Fisher's Exact Test | | | |
| Linear-by-Linear Association | 1.815 | 1 | .178 |
| N of Valid Cases | 60 | | |

Based on the Chi-Square test performed, there was a cell with an actual count of zero specifically in the normotensive group with diabetic blood glucose levels and the contingency table showed an expected count of less than 5. Therefore, the Pearson Chi-Square test was not applicable. As an alternative, Fisher's Exact Test was used, yielding a p-value of 0.333, which is greater than the significance level $\alpha = 0.05$. This result indicates that the p-value exceeds the defined significance threshold ($p = 0.05$), leading to the rejection of the alternative hypothesis (H1) and acceptance of the null hypothesis (H0). Thus, it can be concluded that there is no significant relationship between blood pressure and blood glucose levels among police officers at the Pasuruan Police Resort in 2025.

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## Discussion

### Univariate Analysis

Based on the results of this study, the age group with the highest number of respondents suffering from hypertension was 31–40 years old, accounting for 24 individuals. This is likely because individuals in this age range are at a higher risk of developing hypertension due to additional contributing factors such as life pressure and stress levels. This finding is in line with a study by Eva Emika et al., which found that the highest prevalence of hypertension occurred in the 36–45 age group. The increase in hypertension in this age range is also influenced by both modifiable and non-modifiable risk factors (Emika et al., 2025).

The study also found that the majority of respondents were male, totaling 43 individuals (71.7%), while females accounted for 17 respondents (28.3%). This is consistent with research by Eganda Garwahusada and Bambang Wirjatmadi, which concluded that the prevalence of hypertension is higher in males aged 18–59 years (Garwahusada et al., 2020).

Furthermore, the study showed that most individuals with hypertension had normal blood glucose levels (normoglycemia), amounting to 52 respondents (86.7%). Only 8 hypertensive respondents (13.3%) had elevated blood glucose levels or diabetes. This result supports the findings of Putu Dita et al., which revealed that most individuals with hypertension did not experience elevated blood glucose levels (Sarihati et al., 2021).

From the 60 respondents, 50 individuals (83.3%) were found to have hypertension, while 10 individuals (16.7%) were normotensive. This is consistent with a study conducted by Gusriani et al., which found that hypertension is commonly found among police officers, largely due to unhealthy lifestyle habits such as smoking and obesity (Gusriani et al., 2021).

### Bivariate Analysis

Among the 60 respondents, 42 (70%) were classified as hypertensive with normoglycemia, and 8 (13.3%) as hypertensive with diabetes. Additionally, 10 respondents (16.7%) were normotensive with normoglycemia, and none were normotensive with diabetes regardless of gender.

Based on the Chi-Square test, it was found that there was a cell with an actual count of zero (normotensive with diabetic blood glucose), and the contingency table showed an expected count of less than 5. Thus, the Pearson Chi-Square test could not be used. As an alternative, Fisher's Exact Test was conducted and yielded a p-value of 0.333, which is greater than the significance level $\alpha = 0.05$. Therefore, the alternative hypothesis ($H_1$) is rejected, and the null hypothesis ($H_0$) is accepted, indicating that there is no significant relationship between blood pressure and blood glucose levels among police officers at Pasuruan Police Resort in 2025.

This finding is consistent with the research of Putu Dita et al., which acknowledged that while blood glucose levels can increase blood pressure and the two conditions are significantly related, hypertension does not always cause elevated glucose levels. Hence, there is no specific direct relationship between hypertension and increased blood glucose levels (Sarihati et al., 2021).

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## CONCLUSION

Based on the results of the study, it can be concluded that there is no specific relationship between hypertension and blood glucose levels among police officers aged 30–60 years at the Pasuruan Police Resort. In this study, the majority of respondents with hypertension did not experience elevated blood glucose levels, with 42 respondents (70%) falling into the normoglycemic category. Therefore, the findings of this study answer the specific research objective: Is there a relationship between hypertension and blood glucose levels? The results indicate that no significant relationship exists between hypertension and blood glucose levels.

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