

## **Blood pressure, glucose, cholesterol, and uric acid testing in the elderly in Salam 3, Plumbon Village, Kulon Progo**

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### **Abstract**

Health is a condition of comprehensive well-being—physically, psychologically, spiritually, and socially—that enables everyone to engage actively in social and economic activities. Health assessments, encompassing blood pressure, glucose, cholesterol, and uric acid (GCU) levels, are essential for the early identification of degenerative disorders, especially in adults and the elderly. The aging process makes the body progressively vulnerable to homeostatic disorders, potentially resulting in hypertension, diabetes mellitus, hyperuricemia, and hypercholesterolemia. Regular checkups are essential to prevent complications at the earliest moment. This activity aims to clarify the results of blood pressure and GCU assessments conducted on the elderly in Salam 3 Hamlet, Plumbon Village, Kulon Progo Regency. The assessments were performed directly with the community, focusing on the older population. The assessed parameters comprised blood pressure, random blood glucose levels, total cholesterol levels, and uric acid levels. The test findings were analyzed descriptively to determine the distribution of normal and abnormal values. The test findings indicated that several participants exhibited high blood pressure, high cholesterol levels, and multiple instances of hyperglycemia and hyperuricemia. This condition indicates a risk for degenerative diseases, including hypertension, diabetes mellitus, and several metabolic problems. This screening serves as a promotional and preventive strategy to enhance public knowledge regarding health, physical activity, and sustained productivity in elderly years.

**Keywords:** blood pressure; blood sugar; cholesterol; health check; uric acid

### **1. Introduction**

Individuals aged 60 years or older are classified as elderly. This phase frequently presents numerous issues concerning physical health, psychological states, and social interactions. With advancing age, the body exhibits increased vulnerability to health issues because of decreased organ function. The aging process occurs as a result of decreased cell quantity, less physical activity, an imbalanced diet, and exposure to pollutants and free radicals. These factors induce structural and physiological changes in the body's organs. The WHO (2019) indicates that the global elderly demographic has attained 13.4% and is projected to rise to 25.3% by 2050. A comparable trend is evident in Indonesia, where the Central Statistics Agency (BPS) reports that in 2023, the elderly population will reach 22.6 million, constituting around 11.75% of the overall population. Among this population, 52.28% are female and 47.72% are male. The rise in the older population has led to more intricate health issues stemming from the aging process, which undermines the body's homeostatic functions and increases vulnerability to numerous diseases. These homeostatic disorders relate to the regulation of blood glucose, cholesterol, and uric acid concentrations (Fuad & Putri, 2024).

Hypertension continues to be a significant global health issue, particularly in Indonesia. This condition is often referred to as the silent killer due to its asymptomatic nature, however it may lead to numerous severe cardiovascular issues, including heart attacks, strokes, heart failure, and coronary

artery disease. The prevalence of hypertension in Indonesia is approximately 36%. The 2023 Basic Health Research (Riskesmas) indicates a prevalence of 34.1% (Ministry of Health of the Republic of Indonesia, 2023). In the United States, the American Heart Association (AHA) reports that approximately 74.5 million people aged 20 and older have been diagnosed with hypertension. Notably, the precise causes of almost 95% of hypertension patients remains unidentified (WHO, 2023) (Manongga, Nelwan, & Kaunang, 2024).

A significant determinant of elderly health is blood pressure. Hypertension, or high blood pressure, is a chronic condition that cannot be entirely eradicated, but can be managed with a healthy lifestyle and the administration of antihypertensive drugs. This illness arises from chronically increased blood pressure in the veins, potentially inflicting severe harm to the body's organs. If uncontrolled, hypertension may increase the risk of cardiovascular disease, stroke, renal failure, blindness, and even premature mortality, frequently without noticeable symptoms. Consequently, routine blood pressure assessments are strongly advised for early detection (Pasolon et al., 2024).

Diabetes mellitus, hypercholesterolemia, and gout are three prevalent non-communicable diseases among the older population in Indonesia. These three diseases are metabolic disorders that may result in severe health complications if not identified and addressed promptly. As on 2021 statistics from the International Diabetes Federation (IDF), over 537 million adults aged 20 to 79 years are afflicted with diabetes mellitus. The figure is projected to rise, reaching around 643 million people by 2030 and potentially 783 million by 2045. The 2023 Indonesian Health Survey (SKI) revealed that 11.7% of the population aged 15 and older were diagnosed with diabetes mellitus based on blood sugar level assessments (Ministry of Health of the Republic of Indonesia, 2023) (Novendy, Renaldy, Najiyah, Fadhilah, & Tan, 2024). Conversely, the prevalence of individuals with high cholesterol levels and gout persists in rising, driven by unhealthy lifestyles, insufficient physical activity, and imbalanced dietary practices (Erika, Agussamad, & Hasibuan, 2025).

Blood sugar levels are a significant indicator of health. The blood sugar level originates from the metabolism of dietary carbohydrates and is stored as glycogen in the liver and muscles. Blood sugar assessments are designed to identify the danger of diabetes at an early stage and manage its complications (Utami, Maydianasari, Wantini, Hermawan, & Abeh, 2024). Cholesterol is a yellowish lipid predominantly synthesized in the liver. This molecule is essential for the synthesis of bile salts, which facilitate fat absorption in the intestines. In females, uric acid concentrations are additionally affected by the hormone estrogen. In premenopause, uric acid levels are often reduced due to increased estrogen, which facilitates uric acid excretion through the kidneys. Post-menopause, estrogen levels decrease, increasing the risk of elevated uric acid levels. This disease might increase the risk of hyperuricemia and problems associated with purine metabolism. Cholesterol is categorized into two types: HDL (High-Density Lipoprotein), referred to as "good" cholesterol, and LDL (Low-Density Lipoprotein), termed "bad" cholesterol. LDL accumulates on arterial walls, leading to blockages, whereas HDL facilitates the removal of excess cholesterol, so reducing atherosclerosis and thrombosis (Fuad & Putri, 2024).

The community service program for health assessments of the elderly in Salam III Hamlet, Plumbon Village, Temon District, Kulon Progo, was prompted by the rising elderly demographic in Indonesia, currently totaling 22.6 million people, or 11.75% of the overall population. This number keeps rising as life expectancy rises. The rising population of elderly people correlates directly with a higher risk of chronic diseases, particularly metabolic and cardiovascular conditions. Alongside hypertension, instances of diabetes mellitus, hypercholesterolemia, and gout are all on the rise among the elderly. The International Diabetes Federation (IDF, 2021) reports that 537 million adults globally have diabetes, with projections indicating an increase to 783 million by 2045. The 2023 Indonesian Health Survey (SKI) indicated a diabetes prevalence of 11.7% among people aged 15 and older in Indonesia. Unhealthy lifestyles, insufficient physical activity, and imbalanced dietary habits worsen high cholesterol and gout. Consequently, health assessments for the elderly play an important role in facilitating the prevention and management of non-communicable diseases within the community, while also enhancing the quality of life for seniors in the area.

## 2. Method

The health check-up (GCU) initiative is a program conducted by nursing students in collaboration with the KKN group 30 team, supported by the elderly integrated health post cadres of Salam III Hamlet, Plumbon Village, Temon District, Kulon Progo. The activity was conducted alongside the regular program of the elderly integrated health post to enhance community engagement. The examination was conducted on August 14, 2025, at 9:00 a.m. in the Anggrek Posyandu, Salam III Hamlet. The execution of the activity employed a community participation method, specifically engaging the community in all phases from preparation to evaluation. The examination participants were elderly people present at the posyandu on the day of the event. All participants completed blood pressure examinations, whereas examinations of blood sugar, cholesterol, and uric acid were conducted voluntarily at each participant's preference. The limited availability of GCU sticks necessitated that each participant select only one examination: blood sugar, cholesterol, or uric acid. The majority of participants performed a singular type of GCU examination (blood sugar, cholesterol, or uric acid), while several participants completed a comprehensive examination that included blood pressure and other GCU indicators. Inclusion criteria encompassed residents aged 45 years and above who agreed to participate in the assessment. The work started with collaboration with the village chief and integrated health post cadres to establish the timetable and prepare examination instruments, including sphygmomanometers and meters for blood sugar, cholesterol, and uric acid levels.

Cadres registered participants, after which nursing students measured their blood pressure. Subsequently, blood glucose, cholesterol, and uric acid assessments were conducted utilizing a GCU (Glucose Cholesterol Uric Acid) meter. The parameters employed included a digital sphygmomanometer and measurements of random blood sugar, total cholesterol, and uric acid levels with a calibrated GCU (Glucose Cholesterol Uric Acid) meter. Alongside evaluations of blood pressure, blood glucose, cholesterol, and uric acid, participants also received anthropometric examinations to evaluate nutritional status and metabolic health risks. Measurements comprised height, weight, and waist circumference. The results were documented and immediately communicated to the participants, accompanied by a brief educational presentation on the significance of a nutritious diet, the restriction of sugar and salt consumption, and the necessity of regular physical activity for health maintenance. All examination results were compiled and presented to the integrated health post cadres as foundational data regarding the people's health. The collaboration among students, KKN team members, and female cadres facilitated the effective implementation of this program and increased community awareness regarding the importance of regular health checks.

**Table 1** Interpretation of Blood Pressure Assessment

Value	Interpretation
Systolic <120 mmHg and Diastolic <80 mmHg	Normal blood pressure
Systolic 120-139 mmHg or Diastolic 80-89 mmHg	Pre-hypertension
Systolic 140-159 mmHg or Diastolic 90-99 mmHg	Stage I hypertension
Systolic >160 mmHg or Diastolic >100 mmHg	Stage II hypertension
Systolic >140 mmHg or Diastolic <90 mmHg	Isolated systolic hypertension

**Table 2** Interpretation of Blood Sugar Assessment

Value	Interpretation
<200 mg/dL	Normal when tested during or without fasting
<126 mg/dL	Normal when tested during fasting

**Table 3** Interpretation of Uric Acid Assessment

Value	Interpretation
2,4 mg/dL – 5,7 mg/dL	Normal values for uric acid concentrations in the blood of females
3,4 mg/dL – 7 mg/dL	Normal values for uric acid concentrations in the blood of males

**Table 4** Interpretation of Cholesterol Assessment

Value	Interpretation
<200 mg/dL	Normal total cholesterol levels
<100 mg/dL	Low-Density Lipoprotein (LDL) levels

Value	Interpretation
>60 mg/dL	High-Density Lipoprotein (HDL) levels
<150 mg/dL	Triglyceride levels

### 3. Results and Discussion

#### 3.1. Results

**Table 5** Summary of Community Health Examination Results in Salam III Hamlet

Variable	Number of Tested	Normal (n%)	Abnormal / High (n%)	Highest Value
Blood Pressure	31	16 (51,6%)	15 (48,4%)	197/93 mmHg
Blood Sugar	8	7 (87,5%)	1 (12,5%)	224 mg/dL
Uric Acid	20	15 (75,0%)	5 (25,0%)	10,3 mg/dL
Cholesterol	17	11 (64,7%)	6 (35,3%)	348 mg/dL

A health examination was conducted on August 14, 2025, at 9:00 a.m. at Anggrek Posyandu, Salam III Hamlet, involving 31 participants. Blood pressure assessments were performed on 31 participants, blood sugar assessments on 8 participants, uric acid assessments on 20 participants, and cholesterol assessments on 17 participants. The majority of respondents underwent only one type of GCU examination (blood sugar, cholesterol, or uric acid) based on their selections; however, several participants received a comprehensive examination, resulting in recorded outcomes for multiple parameters. Consequently, the total number of examinations for these three variables exceeded the number of respondents (n = 31). All participants (n = 31) received blood pressure assessments. A total of 15 people (48.4%) had hypertension ( $\geq 140/90$  mmHg), with the maximum recorded value being 197/93 mmHg. This suggests that more than 50% of the respondents have hypertension, predominantly within the age category of 60 years and older. Blood sugar examinations were performed on 8 participants, revealing 1 (12.5%) showed increased blood sugar levels of 224 mg/dL, but the remaining 7 had normal blood sugar levels. Twenty participants received uric acid testing, of which 5 (25%) had high uric acid levels, the maximum recorded result being 10.3 mg/dL. Cholesterol assessments were performed on 17 participants, of whom 6 (35.3%) had high cholesterol levels, with a maximum value of 348 mg/dL.

#### 3.2. Discussion



**Figure 1.** Blood Pressure and GCU Examination in the Elderly

A health examination conducted in Salam III Hamlet, Plumbon Village, Temon District, Kulon Progo, indicated that around 48.4% of 31 participants experienced hypertension, with the highest recorded blood pressure at 197/93 mmHg. This finding shows a significantly increased prevalence of hypertension in the area. Primary risk factors include advanced age, decreased vascular flexibility, and an unhealthy lifestyle. This finding corresponds with the 2023 Basic Health Research and Development (Riskesmas) study, which indicated that the prevalence of hypertension in Indonesia has reached 34.1%, signifying that hypertension requires further attention (Manongga, Nelwan, & Kaunang, 2024). This is likely attributable to the respondents' age, mostly elderly people, as decreased vascular elasticity elevates blood pressure. The prevalence of hypertension significantly increases among the elderly,

especially post-menopause, attributable to a reduction in the hormone estradiol, which protects blood vessels (Rukmini, Laksono, Kusumawati, & Wijayanti, 2021).

In blood sugar assessments, one of the eight participants (12.5%) exhibited increased blood sugar levels, reaching their highest at 224 mg/dL. Despite the modest figure, this condition nonetheless signifies a risk of diabetes mellitus. Contributing variables include a diet rich in simple carbohydrates, insufficient physical activity, and increasing age. Improper management of hyperglycemia can elevate the risk of consequences, including cardiovascular disease and stroke. This signifies a risk of diabetes mellitus, which, if left untreated, will worsen cardiovascular and metabolic complications (Ekasari & Dhanny, 2022). These findings correspond with data from the International Diabetes Federation (2021), which predicts a global increase in diabetes cases from 537 million to 783 million by 2045 (Novendy, Renaldy, Najiyah, Fadhilah, & Tan, 2024). Among the 20 responses received, 25% exhibited increased uric acid levels, with the highest value recorded value at 10.3 mg/dL. Hyperuricemia frequently occurs in the elderly as a result of changes in purine metabolism and increased consumption of animal protein. In postmenopausal women, decreased estrogen levels also lead to increased uric acid concentrations. This syndrome poses a risk of gouty arthritis, marked by intermittent joint discomfort. Factors contributing to increased levels of uric acid include a diet that contains purines, insufficient physical activity, and hormonal changes, particularly in postmenopausal women (Hadi, Amalia, Nuryani, & Meli, 2024).

Cholesterol examinations indicated a significant outcome: 35.3% of participants had elevated cholesterol levels, with a peak value of 348 mg/dL. Hypercholesterolemia is a major risk factor for atherosclerosis, cardiovascular disease, and stroke accident. The primary contributors to increased cholesterol levels are a diet that contains saturated fats, insufficient physical activity, and the aging process. Hypercholesterolemia is a significant risk factor for atherosclerosis, cardiovascular disease, and stroke accident. Hypercholesterolemia is a significant risk factor for cardiovascular diseases, including atherosclerosis, heart attack, and stroke accident. This situation highlights the importance of for proactive and preventive measures, especially through education on a balanced diet, reducing intake of saturated fats, and enhancing physical activity. Increased cholesterol levels are strongly related to a diet rich in saturated fats, advanced age, and insufficient physical activity. These conditions increase the risk of atherosclerosis, stroke, and heart disease (Mumpuni, Kusumastuti, & Manurung, 2023).

The examination results reveal that the residents of Salam III Hamlet, Plumbon Village, Temon District, Kulon Progo are susceptible to degenerative disorders, including hypertension and hypercholesterolemia. Many people showed multiple risk factors, such as hypertension along with hypercholesterolemia, suggesting a susceptibility to metabolic syndrome. Consequently, regular health checks are necessary for early identification. Moreover, continuous educational initiatives concerning nutritious dietary practices, the restriction of sugar, salt, and saturated fat intake, and improvement of physical activity are necessary to prevent further problems.

#### **4. Conclusion**

Health examinations which included blood pressure, blood glucose, uric acid, and cholesterol examinations in Salam III Hamlet, Plumbon Village, Temon District, Kulon Progo, indicated that elderly people are increasingly encountering health issues, including hypertension, hypercholesterolemia, and multiple cases of increased blood sugar levels and uric acid levels beyond normal thresholds. These diseases signify a potential danger for hypertension, diabetes, and several metabolic problems if not addressed immediately. These examinations are an important promotional and preventive action, as health maintenance is insufficient alone during illness. Regular examinations, compliance to a nutritious diet, physical activity, and the reduction of excessive sugar, salt, and fat intake are essential for health maintenance. By implementing these straightforward procedures, people can maintain their health, stay active, and remain productive in their older days.

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