



# Dietary Habits and Blood Pressure in Third-Year Students at GRSMU

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## Abstract

Arterial hypertension (AH) remains a leading modifiable risk factor for cardiovascular complications worldwide. Although AH has traditionally been considered a disease of the elderly, recent epidemiological studies indicate a trend toward an earlier onset of the condition, with data demonstrating a steady increase in the prevalence of elevated blood pressure (BP) among young adults of particular concern is the growing incidence of AH in university students.

**Keywords:** Blood pressure (BP); Poor nutrition; Circulating blood volume (CBV); Psycho-emotional stress

## Introduction

Arterial hypertension (AH) remains a leading modifiable risk factor for cardiovascular complications worldwide. Although AH has traditionally been considered a disease of the elderly, recent epidemiological studies indicate a trend toward an earlier onset of the condition, with data demonstrating a steady increase in the prevalence of elevated blood pressure (BP) among young adults [1]. Of particular concern is the growing incidence of AH in university students. The period of higher education is characterized by significant psycho-emotional stress, which, combined with behavioral risk factors, may predispose individuals to the early development of cardiovascular pathology [2]. Among the key modifiable risk factors, poor nutrition plays a central role. Current evidence suggests that an unbalanced diet high in simple carbohydrates directly affects hemodynamic parameters and contributes to elevated BP [3]. Excessive intake of fast carbohydrates leads to sharp fluctuations in glucose and insulin levels. Insulin is known to stimulate the sympathoadrenal system, an effect observed in both obese and non-obese individuals [4]. Furthermore, insulin enhances the activity of the sodium-hydrogen exchanger (NHE3) in the renal tubules, thereby increasing sodium and water reabsorption and raising circulating blood volume (CBV) [5]. Importantly, this effect may persist even in the presence of insulin resistance – a phenomenon often

described as "selective insulin resistance" – which further contributes to volume-dependent hypertension [6]. In contrast to glucose, fructose metabolism in the liver is accompanied by uric acid production. Hyperuricemia inhibits endothelial nitric oxide synthase, leading to a deficiency of nitric oxide, a key vasodilator. This results in endothelial dysfunction and sustained vasospasm [7]. Excessive dietary salt intake also promotes fluid retention [8] and activates the sympathoadrenal system [9]. Medical students are particularly vulnerable to poor dietary habits due to the demanding nature of their training, which often disrupts regular and balanced nutrition.

## Objective

The aim of this study was to assess the prevalence of self-reported episodes of elevated blood pressure among third-year students at Grodno State Medical University during the 2025/2026 academic year in relation to their dietary habits.

## Materials and Methods

The study included 385 female and 160 male third-year students enrolled at Grodno State Medical University in the 2025/2026 academic year. All participants provided voluntary informed consent. Data were collected via a structured questionnaire addressing the following items: history of elevated BP episodes

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(response options: "yes," "no," "don't know"); self-assessed dietary pattern ("balanced," "unbalanced"); and self-reported excessive consumption of salty foods and sweet foods (both with "yes/no" responses). Students who answered "don't know" to the question regarding BP episodes were excluded from the analysis. Data are presented as absolute and relative frequencies (%). Between-group comparisons were performed using Fisher's exact test. A p-value of less than 0.05 was considered statistically

significant. Statistical analysis was conducted using StatSoft STATISTICA 10.0 software.

## Results and Discussion

Among female students, episodes of elevated BP were reported more frequently by those with an unbalanced diet (n=179) compared to those with a balanced diet (n=145): 26.82% versus 17.93%, respectively (Table 1).

**Table 1:** Dietary patterns and self-reported episodes of elevated blood pressure in third-year female students at GRSMU, 2025/2026 academic year, % (n).

Dietary Pattern	n	No history of elevated BP	History of elevated BP
Balanced	145	82.07% (119)	17.93% (26)
Unbalanced	179	73.18% (131)	26.82% (48)

**Table 2:** Excessive salty food intake and self-reported episodes of elevated blood pressure in third-year male students at GRSMU, 2025/2026 academic year, % (n).

Excessive Salty Food Intake	n	No history of elevated BP	History of elevated BP
No	103	76.70% (79)	23.30% (24)
Yes	33	60.61% (20)	39.39% (13)

**Table 3:** Excessive sweet food intake and self-reported episodes of elevated blood pressure in third-year male students at GRSMU, 2025/2026 academic year, % (n).

Excessive sweet food intake	n	No history of elevated BP	History of elevated BP
No	86	79.07% (68)	20.93% (18)
Yes	50	62.00% (31)	38.00% (19)

Among male students, those reporting excessive consumption of salty foods (n=33) had a significantly higher frequency of elevated BP episodes than those who did not (n=103): 39.39% vs. 23.30%, p=0.042 (Table 2). Similarly, male students who reported excessive consumption of sweet foods (n=50) experienced episodes of elevated PB more often than those who did not (n=86): 38.00% versus 20.93%, p=0.026 (Table 3).

## Conclusion

Dietary patterns influence hemodynamic parameters in both female and male third-year students at GRSMU, as evidenced by a higher incidence of self-reported episodes of elevated blood pressure among females with unbalanced diets and males who consume excessive amounts of salty and sweet foods.

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SUNTEXT REVIEWS

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