

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

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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 (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)

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).

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)

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).

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)

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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