

THE EFFECT OF STRESSFUL FACTORS ON THE DEVELOPMENT OF ARTERIAL HYPERTENSION IN UNIVERSITY STUDENTS

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Purpose of the Study. The primary objective of this research is to analyze the influence of various stress-inducing factors on the onset and early progression of arterial hypertension among university students. This investigation focuses on identifying the interrelation between psychological stress, lifestyle deviations, and functional disturbances in cardiovascular regulation during a formative stage of adulthood.

Materials and Methods. The cross-sectional study was carried out at Samarkand State Medical University and involved a total of 120 full-time students aged 18 to 25. All participants underwent comprehensive physical and clinical assessment, including measurement of arterial blood pressure using validated automatic sphygmomanometers, determination of heart rate, and calculation of body mass index (BMI). Medical history was recorded, emphasizing hereditary factors, comorbidities, and lifestyle routines. To evaluate psychological stress levels, the standardized Perceived Stress Scale (PSS-10) was employed. Additionally, a structured questionnaire was administered to gather data on participants' daily habits, including sleep duration, dietary behavior, use of stimulants (such as caffeine or nicotine), physical activity, and academic workload. Based on blood pressure readings, students were categorized into two subgroups: Group A – normotensive (BP <130/80 mmHg) and Group B – prehypertensive or hypertensive (BP ≥130/80 mmHg), as defined by the latest clinical guidelines. Furthermore, blood samples were collected from a subset of participants to analyze fasting blood glucose, serum cholesterol, and plasma cortisol levels. The statistical analysis involved correlation and regression models to determine the relationship between stress intensity and blood pressure indicators.

Results and Discussion. The findings demonstrated that 49 out of 120 students (40.8%) had elevated or borderline high blood pressure levels, despite their young age. Among this group, a significant majority (83.7%) reported moderate to high stress levels, reflected by PSS-10 scores above 20 points. Notably, 61.2% of hypertensive students had no hereditary predisposition, pointing to a dominant role of acquired behavioral and emotional triggers. The most prevalent stressors included

excessive academic demands (86.4%), emotional burnout due to lack of rest (72.3%), examination anxiety (69.8%), sleep deprivation (66.7%), and socioeconomic difficulties (53.2%). In this subgroup, irregular sleep patterns, insufficient physical activity, and frequent consumption of caffeine-containing beverages were also significantly more common. Heart rate was on average 11 bpm higher in the hypertensive group, and their BMI values tended to be slightly elevated. Biochemical analysis revealed increased cortisol concentrations in 14 out of 20 tested students with elevated BP, supporting the hypothesis of neuroendocrine activation under chronic stress. A statistically significant positive correlation ($r = 0.51$, $p < 0.01$) was observed between the PSS score and systolic blood pressure. These results confirm that prolonged exposure to stressors activates the hypothalamic-pituitary-adrenal (HPA) axis and sympathetic nervous system, which can provoke vascular tone abnormalities and lead to persistent hypertension, even in young populations.

Conclusion .This research underscores the critical influence of psychological and behavioral stressors on the early development of arterial hypertension among medical students. The data clearly demonstrate that chronic stress, in combination with disrupted lifestyle routines, has a profound effect on cardiovascular regulation and may lead to preclinical or established hypertensive conditions. Preventive strategies should focus on early screening for elevated stress levels and timely correction of modifiable risk factors through health education, psychological counseling, and the promotion of healthy habits. Implementation of stress reduction techniques, such as mindfulness practices, adequate rest, and regular physical exercise, could significantly reduce the incidence of hypertension in the student population. Universities and academic institutions must recognize the growing burden of psychosocial stress among youth and integrate mental health programs as part of comprehensive student support systems to safeguard long-term cardiovascular health.