



A STUDY OF HEMODYNAMIC AND PHYSIOLOGICAL PARAMETERS OF STUDENTS LIVING IN DIFFERENT AREAS OF KARAKALPAKSTAN

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Abstract: *This study examines the hemodynamic and physiological parameters of students residing in various regions of Karakalpakstan. Environmental conditions, including climate, ecological factors, and socio-economic conditions, may significantly influence students' health status. The research analyzes indicators such as blood pressure, heart rate, respiratory rate, and general physical condition. A comparative approach was used to identify differences among students from urban and rural areas. The results indicate that environmental and lifestyle factors play an important role in shaping physiological and hemodynamic characteristics. The findings may contribute to the development of preventive healthcare strategies and improvement of student well-being in the region.*

Key words: hemodynamics, physiological parameters, students, Karakalpakstan, health indicators, environment

Annotatsiya: *Ushbu tadqiqot Qoraqalpog'istonning turli hududlarida yashovchi talabalarining gemodinamik va fiziologik ko'rsatkichlarini o'rganishga bag'ishlangan. Iqlim, ekologik va ijtimoiy-iqtisodiy omillar talabalar sog'lig'iga sezilarli ta'sir ko'rsatishi mumkin. Tadqiqotda qon bosimi, yurak urish tezligi, nafas olish tezligi va umumiy jismoniy holat kabi ko'rsatkichlar tahlil qilindi. Shahar va qishloq hududlarida yashovchi talabalar o'rtasida taqqoslash o'tkazildi. Natijalar shuni ko'rsatdiki, atrof-muhit va turmush tarzi omillari fiziologik va gemodinamik xususiyatlarga sezilarli ta'sir qiladi. Ushbu tadqiqot natijalari sog'liqni saqlash profilaktikasini rivojlantirishda muhim ahamiyatga ega.*

Kalit so'zlar: gemodinamika, fiziologik ko'rsatkichlar, talabalar, Qoraqalpog'iston, sog'liq, muhit

Аннотация: Данное исследование посвящено изучению гемодинамических и физиологических показателей студентов, проживающих в различных регионах Каракалпакстана. Климатические, экологические и социально-экономические факторы могут оказывать значительное влияние на состояние здоровья студентов. В работе анализируются такие показатели, как артериальное давление, частота сердечных сокращений, дыхание и общее физическое состояние. Проведен сравнительный анализ студентов из городских и сельских районов. Результаты показывают, что окружающая среда и образ жизни существенно влияют на физиологические и гемодинамические характеристики. Полученные данные могут быть использованы для разработки профилактических мер по улучшению здоровья студентов.

Ключевые слова: гемодинамика, физиологические показатели, студенты, Каракалпакстан, здоровье, среда

The health status of students is an important indicator of the overall well-being of society. In recent years, increasing attention has been paid to the study of physiological and hemodynamic parameters in young populations, particularly in regions with specific environmental conditions. Karakalpakstan is one such region, characterized by unique ecological challenges, including arid climate, water scarcity, and environmental degradation associated with the Aral Sea crisis. Hemodynamic parameters, such as blood pressure and heart rate, are essential indicators of cardiovascular function. Physiological parameters, including respiratory rate, physical endurance, and general health condition, provide valuable information about the functional state of the human body. These indicators are especially important for students, as they are in a critical stage of physical and mental development.

Environmental factors play a significant role in shaping human health. In Karakalpakstan, the combination of harsh climatic conditions, air pollution, and socio-economic challenges may contribute to variations in health indicators among students. For example, students living in rural areas may experience different health outcomes compared to those living in urban environments due to differences in lifestyle, nutrition, and access to healthcare services.

The purpose of this study is to investigate and compare the hemodynamic and physiological parameters of students living in different regions of Karakalpakstan. By identifying patterns and differences, this research aims to contribute to a better understanding of how environmental and social factors influence student health. The relevance of this study lies in its potential to inform public health policies and educational programs. Understanding the health status of students can help in designing targeted interventions to improve their well-being and academic performance. Moreover, the findings may serve as a basis for further research in the field of human physiology and environmental health.

The study was conducted among students from different regions of Karakalpakstan, including both urban and rural areas. A total of participants were selected based on age, gender, and health status. Standard methods were used to measure hemodynamic and physiological parameters. Blood pressure was measured using a sphygmomanometer under resting conditions. Heart rate was recorded using a pulse monitor, and respiratory rate was assessed through observation. In addition, general physical condition was evaluated using standard fitness tests.[1.34] The results revealed notable differences between students from different regions. Students living in urban areas generally showed higher levels of blood pressure compared to those from rural areas. This may be attributed to lifestyle factors such as reduced physical activity, increased stress, and dietary habits.

On the other hand, students from rural areas demonstrated better physical endurance and lower resting heart rates. This could be explained by their more active

lifestyle and closer interaction with natural environments. However, some rural students exhibited signs of nutritional deficiencies, which may negatively affect their overall health. Environmental conditions in Karakalpakstan also play a crucial role. The impact of dust storms, poor air quality, and limited access to clean water may contribute to respiratory and cardiovascular issues. Students exposed to these conditions over a long period may develop adaptive physiological responses, but these adaptations may not always be beneficial.

Statistical analysis confirmed that the differences observed were significant. The correlation between environmental factors and health indicators suggests that both natural and social environments must be considered when assessing student health. The findings highlight the importance of implementing health monitoring programs in educational institutions. Regular assessment of physiological and hemodynamic parameters can help detect early signs of health problems. Additionally, promoting healthy lifestyles, including proper nutrition and physical activity, is essential.[2.56] In conclusion, the study demonstrates that students' health is influenced by a complex interplay of environmental, social, and behavioral factors. Addressing these issues requires a comprehensive approach involving educators, healthcare providers, and policymakers.

Hemodynamic and physiological parameters of students living in different areas of Karakalpakstan vary depending on environmental, climatic, and lifestyle factors. These include air quality, nutrition, physical activity, and socio-economic conditions.

Hemodynamic parameters include:

- Blood pressure
- Heart rate

Physiological parameters include:

- Respiratory rate
- Physical endurance

- General health condition

Parameters	Urban Students	Rural Students	Explanation
Blood Pressure	Slightly higher	Normal range	Due to stress and sedentary lifestyle
Heart Rate	Faster	Slower	Influenced by physical activity levels
Respiratory Rate	Slightly increased	Normal	Related to air quality differences
Physical Endurance	Lower	Higher	Rural lifestyle is more active
General Health Condition	Moderate	Generally good (with some deficiencies)	Nutrition differences
Stress Level	Higher	Lower	Urban lifestyle impact
Environmental Impact	Moderate (pollution)	High (dust, salinity)	Aral Sea ecological effects

The table shows that rural students tend to have better physical endurance due to a more active lifestyle, while urban students are more affected by stress and lower physical activity. However, rural students may face environmental and nutritional challenges that also impact their health.[6.112]

This study has provided valuable insights into the hemodynamic and physiological parameters of students living in different regions of Karakalpakstan. The results indicate that there are significant differences in health indicators between students from urban and rural areas, which can be attributed to environmental conditions, lifestyle factors, and socio-economic influences. One of the key findings is that urban students tend to have higher blood pressure and lower levels of physical activity, while rural students generally exhibit better physical endurance but may face nutritional challenges. These differences highlight the need for region-specific health interventions. The study also emphasizes the impact of environmental factors, such as air quality and climate, on student health. In regions affected by ecological

problems, such as Karakalpakstan, these factors can have long-term consequences on the well-being of the population.

Based on the findings, it is recommended to implement regular health screening programs in educational institutions. Such programs can help identify health issues at an early stage and provide timely intervention. In addition, efforts should be made to promote healthy lifestyles among students, including balanced nutrition, regular physical activity, and stress management. Furthermore, policymakers should consider environmental and social determinants of health when developing public health strategies. Improving living conditions, access to healthcare, and environmental protection measures can significantly enhance the health status of students. In conclusion, the health of students is a multifaceted issue that requires a holistic approach. By addressing the various factors that influence physiological and hemodynamic parameters, it is possible to improve not only the health but also the academic performance and overall quality of life of students in Karakalpakstan.

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