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Environmental situation on campus: Assessing the impact of the environment on international students in the context of sustainable development of education

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Abstract. This study aims to investigate the environmental situation on university campuses and its impact on international students within the framework of sustainable development in education. The research focuses on assessing how the campus environment influences the functional state and adaptive potential of international students. By examining factors such as air and water quality, green spaces, waste management, and overall campus sustainability practices, the study seeks to understand how these elements contribute to the well-being and academic success of international students. The findings of this research are expected to provide valuable insights into the importance of creating a sustainable and supportive learning environment for international students, thereby promoting their overall health, academic performance, and satisfaction with their educational experience.

1 Introduction

In today's society, characterized by the prominence of information and knowledge, education plays a crucial role as a holistic process through which students not only acquire skills and expertise but also develop attitudes conducive to effective social inclusion. This vision aligns with the fourth goal of the 2030 Agenda for Sustainable Development, which advocates for equitable quality education. Such education not only enhances standards of living but also empowers individuals to contribute innovative solutions to societal challenges.

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The educational approach outlined in the 2030 Agenda emphasizes the importance of preparing students to thrive in society. Education serves as a vital resource for personal and professional growth, facilitating social engagement and preventing exclusion, thereby fostering societal transformation and well-being.

To realize these objectives, it is imperative for agencies, organizations, and corporations to prioritize the implementation and promotion of formal education, surpassing the efforts of voluntary projects or informal activities. Higher education, as a repository of cultural heritage, bears significant responsibility in integrating sustainability into its curriculum development, thereby exerting a considerable socio-environmental impact. The recognition of higher education's role in advancing sustainability represents a growing area of research in the scientific community.

Achieving sustainability in higher education necessitates employing specific methodologies and understanding the resources and contexts of educational interactions. It requires acknowledging education as an integral component of a larger ecosystem with a shared goal of fostering meaningful learning driven by motivation and engagement. The educational process at the university must take into account the physiological characteristics and mechanisms of students' performance. To do this, it is necessary to develop reasonable work and rest regimes aimed at accelerating the recovery process and achieving the maximum period of effective work for students. Particular attention should be paid to the adaptation of foreign students. In this regard, the purpose of this study is to determine the indicators of successful adaptation of foreign students studying at Astana Medical University in Kazakhstan during their studies.

2 Research methodology

The study was conducted on the basis of Astana Medical University. The study involved 66 foreign students of AMU (Astana Medical University), based in Astana (Kazakhstan) 17 women and 49 men of different nationalities, 2 students from Ukraine, 31 students from Jordan, 33 students from India, by measuring pulse, blood pressure, height, weight, breath-hold time, and use of a standard varicard analysis protocol, which is performed in 5-minute recording sections that record electrocardiography and heart rate variability analysis.

Morphological parameters were analyzed: height, body weight and Quetelet index as the ratio of body weight (in kg) to length (in cm); physical fitness: strength and speed-strength qualities (arm dynamometry, 100 m run); functional indicators and indices: respiratory rate (RR), heart rate (HR), diastolic blood pressure (DBP) and systolic blood pressure (SBP), Kerdo index - as the ratio of diastolic blood pressure to pulse per minute.

Statistical processing of the obtained data was carried out using the SPSS software package using standard methods of parametric statistics.

3 Results and Discussions

In the past, human needs were few due to low population, which didn't significantly impact nature. But today, with a growing population, human needs are overwhelming the environment, endangering land and water resources. Unplanned resource use, along with modernization, deforestation, pollution, and rapid industrialization, exacerbates the problem. Thus, implementing and improving Environmental Education (EE) is crucial to preserve natural resources and the planet. EE in schools raises awareness among young

learners, equipping them with the knowledge and skills to address environmental challenges responsibly. While EE can't directly instill pro-environmental behavior, it fosters emotional involvement and environmental consciousness. The framework for EE, established by the North American Association for Environmental Education (NAAEE), emphasizes the importance of individuals making informed decisions and taking positive environmental actions in their civic lives. According to Sharma (2016), environmentally literate individuals should exhibit high ethical standards, cognitive abilities, affective dispositions, and a deep understanding of environmental issues.

In our study, 24 students, including 4 women and 20 men (36.36%), were overweight. At the same time, 25 students, including 7 women and 18 men (37.88%), were underweight. Only 16 students, including 6 women and 10 men (24.24%) were of normal weight according to Quetelet weight-height index (Figure 1).

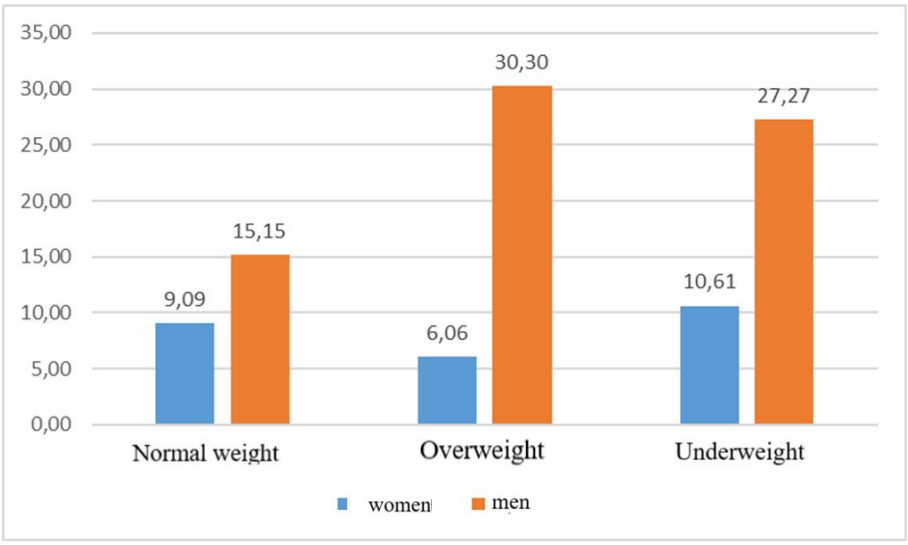

Figure 1. Body weight indicators according to the Quetelet index among foreign students of AMU

According to Figure No. 1, it can be observed that according to the Quetelet index, foreign students have a high percentage of deviations from the norm in weight, both in the direction of increasing and decreasing, which can be the result of both physical and mental factors, and the result of the influence of the endocrine glands, which can lead to to various diseases. Physical development largely depends on hereditary characteristics, living conditions, upbringing, lifestyle and sports activities.

As a result of the study, it was found that the majority of foreign students at AMU are characterized by a predominance of the parasympathetic tone, which is indicated by a negative Kerdo index (77%). And 17% had eutonia and 6% had sympathicotonia (Figure 1).

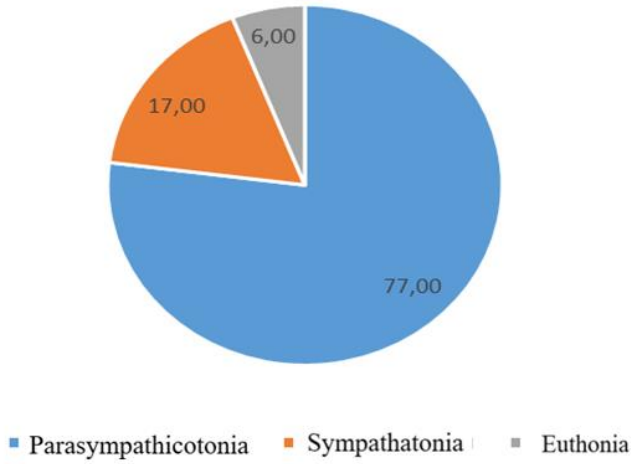

Figure 2. Indicators of the functional state of the autonomic nervous system according to the Kerdo index

When assessing morphological indicators, as shown in Figure 2, students with a predominance of parasympathetic tone had the highest value of the Quetelet index - 26.33±4.37, corresponding to the lower limit of excess body weight. In students with eutonia and with a predominance of sympathetic influences, this value was 22.93±0.92 and 24.70±0.67, which corresponded to normal body weight. An analysis of strength qualities and endurance indicators showed that those surveyed with eutonia had good results in the 100-meter run test and the press test - the total number of bends. In our study, we found that 1 woman and 4 men had severe arrhythmia, accounting for 7.58% of cases. 9 women and 37 men had moderate arrhythmia (69.70%), and only 5 women and 10 men had normal heart rhythm (22.73%) (Figure 3).

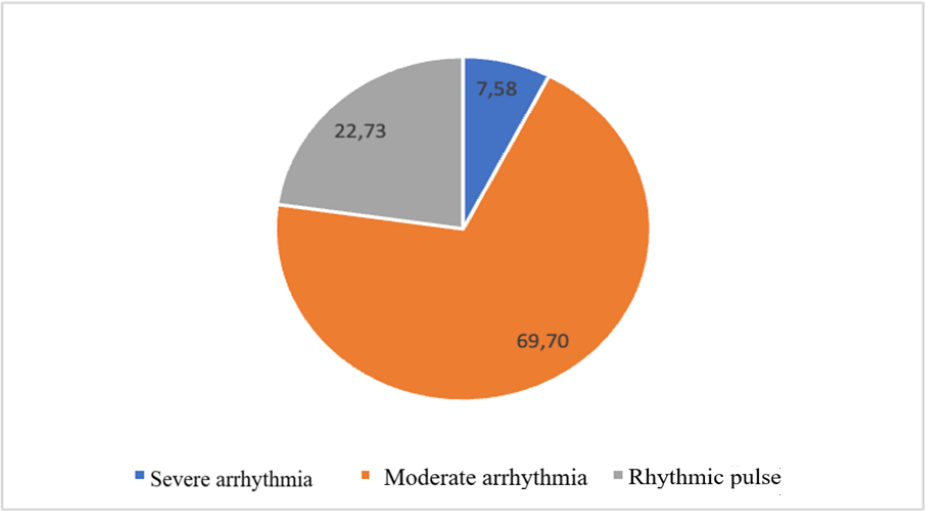

Figure 3 Heart rate indicators in foreign students

A high rate of moderate and severe arrhythmia, as shown in Figure 3, in foreign students of a medical university can provoke dizziness, loss of consciousness, deterioration of blood supply to the heart and brain due to insufficient cardiac output.

4 Conclusions

The presented materials will be useful for the development of measures aimed at correcting the functional state of the body and adaptation of foreign students of medical universities.

In conclusion, the assessment of the functional state and adaptive potential of foreign students within the context of sustainable development in the learning environment reveals the critical importance of fostering inclusivity, support, and cultural diversity within educational institutions.

Through this assessment, several key findings have emerged:

1. Foreign students face unique challenges, including language barriers, cultural differences, and adaptation to new academic systems, which can impact their academic performance and socio-emotional well-being.

2. Understanding the functional state of foreign students, including their academic performance and integration into the academic community, is essential for identifying areas for improvement and implementing targeted support mechanisms.

3. The adaptive potential of foreign students— their ability to navigate and thrive in unfamiliar environments— is a crucial factor in promoting their holistic development and success.

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