



ASSESSMENT OF HEART RATE INDICATORS IN MEDICAL STUDENTS ENGAGED IN REGULAR PHYSICAL ACTIVITY

Shakhsanem Sabitovna Eshbanbetova

Student at Tashkent State Medical University

Scientific Supervisor: **Dilnora Khislatovna Khayrullaeva**

Assistant of the Department of Physiology,

Tashkent State Medical University

Abstract: This study is dedicated to assessing heart rate (HR) indicators in students of the Faculty of Medicine who regularly engage in physical activity, compared to their peers with low activity levels. The study included 50 students aged 18–24: 30 who actively participate in sports and 20 who do not engage in regular training. HR was measured using palpation of the radial artery at rest, immediately after standard physical exertion, and 5 minutes into recovery.

The results showed that students engaged in sports had lower resting HR and faster recovery after exertion compared to the control group. A direct correlation was observed between the frequency of physical activity and the speed of HR recovery.

The study confirms the positive impact of regular physical activity on the functional state of students' cardiovascular system.

Keywords: students engaged in sports; heart rate (HR); palpation; recovery; physical activity.

Аннотация: Данное исследование посвящено оценке показателей частоты сердечных сокращений (ЧСС) у студентов факультета «Лечебное дело», систематически занимающихся физической активностью, по сравнению с их сверстниками с низким уровнем активности. В исследование включено 50 студентов в возрасте 18–24 лет: 30 активно занимаются спортом, 20 не имеют регулярных тренировок. Измерение ЧСС проводилось методом пальпации на лучевой артерии в покое, сразу после стандартной физической нагрузки и через 5 минут восстановления.

Результаты показали, что студенты, занимающиеся спортом, имели более низкую ЧСС в покое и более быстрое восстановление после нагрузки по сравнению с контрольной группой. Выявлена прямая зависимость между частотой занятий и скоростью восстановления ЧСС.

Исследование подтверждает положительное влияние регулярной физической активности на функциональное состояние сердечно-сосудистой системы студентов.

Ключевые слова: студенты, занимающиеся спортом; частота сердечных сокращений (ЧСС); пальпация; восстановление; физическая активность.



Annotatsiya. Ushbu tadqiqot «Tibbiyot» fakultet talabalari orasida muntazam jismoniy faoliyat bilan shug'ullanuvchilarning yurak urishi tezligi (ChSS) ko'rsatkichlarini, jismoniy faoliyat darajasi past bo'lgan yoshlar bilan solishtirishga bag'ishlangan. Tadqiqotga 18–24 yoshdagi 50 ta talabalar qo'shilgan: 30 nafar muntazam sport bilan shug'ullanadi, 20 nafar esa tartibli mashqlar bajararmaydi. ChSS ni tik holatda, standart jismoniy yuklanishdan so'ng va 5 daqiqa ichida tiklanish jarayonida radial arteriyada palpatsiya usuli bilan o'lchandilar.

Natijalar shuni ko'rsatdiki, sport bilan shug'ullanuvchi talabalar tik holatda ChSS past va yuklanishdan keyin tiklanish tezligi yuqori bo'lgan. ChSS tiklanish tezligiga mashqlarning takrorlanish jihatidan orasidagi farqdan to'g'ri bog'liqlik aniqlandi.

Tadqiqot muntazam jismoniy faoliyatning talabalarning yurak-qon tomir tizimi funksional holatiga ijobiy ta'sir ko'rsatishini tasdiqlaydi.

Kalit so'zlar: sport bilan shug'ullanuvchi talabalar; yurak urishi tezligi (ChSS); palpatsiya; tiklanish; jismoniy faoliyat.

Materials and Methods

The study was conducted at the Faculty of General Medicine. A total of 50 students aged 18–24 years were included: 30 students regularly engaged in mixed types of physical activity (at least 3 times per week), and 20 students without regular training (control group). Inclusion criteria: absence of acute and chronic cardiovascular diseases, and voluntary consent to participate.

Heart rate (HR) measurements were performed manually by palpation on the radial artery of the right hand using a stopwatch. The procedure and time points of measurement were standardized:

1. **Resting HR** — measured after 10 minutes of seated rest in a room with a comfortable temperature.
2. **HR immediately after exercise** — participants performed a one-minute squat set at a pace of 22–25 squats per minute; measurement was taken immediately after the exercise.
3. **HR after 5 minutes of recovery** — participants remained seated quietly; measurement was repeated after 5 minutes.

Assessment of Physical Activity:

The IPAQ-Short questionnaire was used. Participants were categorized into “moderate/high activity” and “low activity” (control) groups.

Statistical Analysis:

Data are presented as $M \pm SD$. Paired and independent t-tests were used to compare HR between states and groups. Correlation between exercise frequency and recovery rate was assessed using Pearson's coefficient. Statistical significance was set at $p < 0.05$.

Results



At rest, HR of students who regularly engaged in physical activity was lower than that of the control group.

After the one-minute exercise, HR increased in active students but returned to baseline faster than in the control group.

After 5 minutes of recovery, HR in students with regular physical activity almost completely normalized, whereas recovery was slower in students with low activity.

Correlation analysis revealed a direct relationship between the frequency of exercise and the speed of HR recovery.

These findings indicate better cardiovascular adaptation in students who systematically engage in physical activity.

Discussion

Regular physical activity improves the functional state of the cardiovascular system, reduces resting HR, and accelerates recovery after exercise. This is associated with improved autonomic nervous system tone, increased myocardial contractility, and enhanced cardiovascular regulation.

Comparison with other studies shows that young people leading an active lifestyle have a more stable response to stress, faster return to baseline HR, and a reduced risk of early functional cardiac disorders.

The results support the need to include regular physical activity in the daily routine of students, especially under the conditions of an intensive academic schedule.

Conclusion

Regular physical activity positively affects the cardiovascular system of medical students:

- reduces resting HR;
- accelerates recovery after exercise;
- improves the body's adaptation to physical and emotional stress.

Key Findings

1. Students who regularly engage in sports have lower resting HR and recover faster after physical activity.
2. The correlation between exercise frequency and recovery rate confirms the positive effect of regular physical activity.
3. The results highlight the importance of including moderate and high-intensity physical activity in the daily lives of students to strengthen health.



References:

1. American Heart Association. Physical activity and cardiovascular health. Circulation, 2018.
2. Ilyin L.B., Physical Activity and Student Health, Moscow, 2020.
3. WHO. Global Recommendations on Physical Activity for Health. World Health Organization, 2010.
4. Astakhova I.V., Cardiovascular adaptation to physical activity in students, Journal of Physiology, 2019.
5. Craig C.L. et al. International Physical Activity Questionnaire: 12-country reliability and validity. Med Sci Sports Exerc, 2003.