

## **SWIMMING AS PREVENTION OF HARMFUL EFFECTS OF MODERN TECHNOLOGIES**

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**Abstract.** Worrying is the fact that there is a deficit for educational information on health and the role of physical activity for improving it. Scientists have long found that one of the most risk factors for human health is the lack of physical activity. The development of modern technologies is a growing process in our society and further contributes for the prematurely damaging of the musculoskeletal system. Swimming, as a type of physical activity, gives opportunity for reducing the harmful effects of this process and is a good option for preventing a number of health problems associated with the improper posture while sitting in front of the computer or other smart device. Based on our research's results were made conclusions focusing on prevention, health support and improving quality of life, by introducing a programme for rising the awareness of the harm and consequences of prolonged sitting in front of computers, as well as avoiding developing dependence on the use of modern technologies and counteracting it through the means of swimming.

*Keywords:* swimming; prevention; modern technologies; computer

### **1. Introduction**

A major challenge of modern society is the immobilization of humanity globally, which puts on the agenda the need to educate people about the health benefits of regular physical exercise. The problem of insufficient knowledge on sport as a socio-biological phenomenon is relevant and very serious for the Bulgarian society. It finds the strongest manifestation in young people of school and university age, in who, the hypodynamia due to the mass penetration of modern technologies into their everyday life, leads to the alarming findings of a number of studies on the people's health in childhood and youth. Modern technologies and the sedation in front of a computer, in addition to tired eyes force the spine to curve in an irregular "C" shape, which harmfully burdens muscles, joints and inter vertebrae discs. The buttocks and abdominal muscles weaken. All of those factors lead to soreness and recently to a decrease in the age limit of those affected by a herniated disc condition.

Hristova, in her study, concludes that “Untrained musculature is atrophied and cannot well perform one of its main functions – to keep the skeleton in its correct position”. Some of her study’s findings prove the latter: 17.67% of the students surveyed, experienced permanent pain in the back, waist, knees and ankles; 32.33% of them experience pain from time to time and list the same parts of the body (Hristova 2016).

Even in ancient times Aristotle has said that: “Nothing so drains and destroys the body as prolonged physical inactivity!”. In response to the aforementioned alarming findings, all existing continental, over-government, inter-governmental organizations and national Governments have adopted and signed charters and plans for action. The relevant Ministries (including the Bulgarian) have drawn up laws and regulations related to accustoming the population to regular exercise and leading an active lifestyle. The respective ministries (including the Bulgarian) have written laws and regulations for their implementation, with focus on children and youth (Hristova 2019). However, a number of scientists claim that no analysis has been made in Bulgaria on whether the policy, strategy and programming of the management of physical education and sport in accordance with European documents is respected. (Bankov & Kostova 2019).

In this study, we are establishing the role of swimming as physical activity for reducing the harmful effects of modern technologies, a process that is growing in our society, which cause damaging of the musculoskeletal apparatus prematurely and at an unprecedented rate.

Swimming is very different from other known sports, especially with the nature and diversity of movements, and the specifics of the unusual environment, in which it takes place. This type of motor activity has the most multifaceted effect on the human body. The hydraulic pressure, lifting force and resistance that water exerts on the body moving in it, have a beneficial effect on all functions and systems of the body. Regular swimming activities protect against joint changes in the spine as well as in the entire musculoskeletal system. Optimizing the motor regime with the means of swimming is a good way to prevent and/or reduce various health problems (Rangelova & Tumanova 2017).

Prevention and rehabilitation of improper posture through the means of swimming as physical activity, is extremely suitable for people working in the field of modern technologies and spending most of their day sitting in front of a computer. In the scheme, we proposed for prevention of the above-mentioned problem, in addition to regular swimming activities we included and theoretical part, explaining the harm of prolonged sitting in front of a smart device. We emphasized the need to alternate its use with regular physical activity, and in particular, to include swimming in leisure activities during the exams session and summer vacation (minimum three times a week).

The **subject** of our study were students who chose swimming during their studies at the university, and who, as per our requirement, have established disorders in the musculoskeletal system or a certain discomfort/pain in considered parts of the body, as well as not to have been engaged in swimming classes before.

The object of examination were the prevention and rehabilitation of violations and problems in the musculoskeletal system.

In a preliminary survey, held at the beginning of the summer semester, we gathered information about the presence of already established disorders in the musculoskeletal system or some discomfort such as pain/stiffness in different parts of the body. In addition to the health problems, we gathered information about the time everyone spends in front of a computer and/or a mobile device, as well as the time they spent for physical activity, before enlisting for swimming classes.

At the end of the winter semester of the next academic year, the participants in the experiment completed a second survey in which the answers to our questions, showed whether our proposed swimming prevention scheme and the more active lifestyle, had an effect.

The method of direct individual survey was used through specially developed two questionnaires with seven questions. The poll cards were anonymous. The individual empirical information was collected within two semesters of 2018/19 and 2019/20 academic years. Processed and analyzed were 129 survey cards (3 survey cards were transmitted empty or incomplete).

## **2. Results**

Regarding that, the number of students surveyed is small, the results of our survey will be presented as general guidance in terms of the research problem.

The results obtained are systematized by problems, and illustrated in figures.

The age distribution of respondents was 22,39 years for men and 20,73 for women.

**Poll 1** (conducted at the beginning of the summer semester of 2018/2019 academic year)

To the question “Are you aware of having violations in your musculoskeletal system?”, 75% of the students surveyed, replied that they had been found to have some over time (Fig. 1):

- in the feet – are the answers of 37% of the respondents;
- spine distortions – 47%;
- 16% of students are unaware of the existence of such violations,

The question “When do you experience pain, stiffness or discomfort in the area of the spine?”, had two options given:

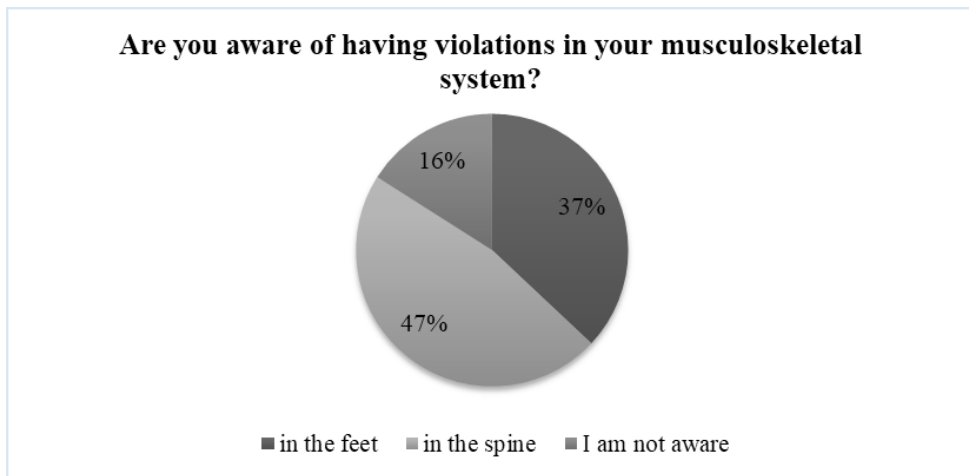


Figure 1

- constantly
- only after a long sitting (over 60 minutes) in front of a computer/smart device

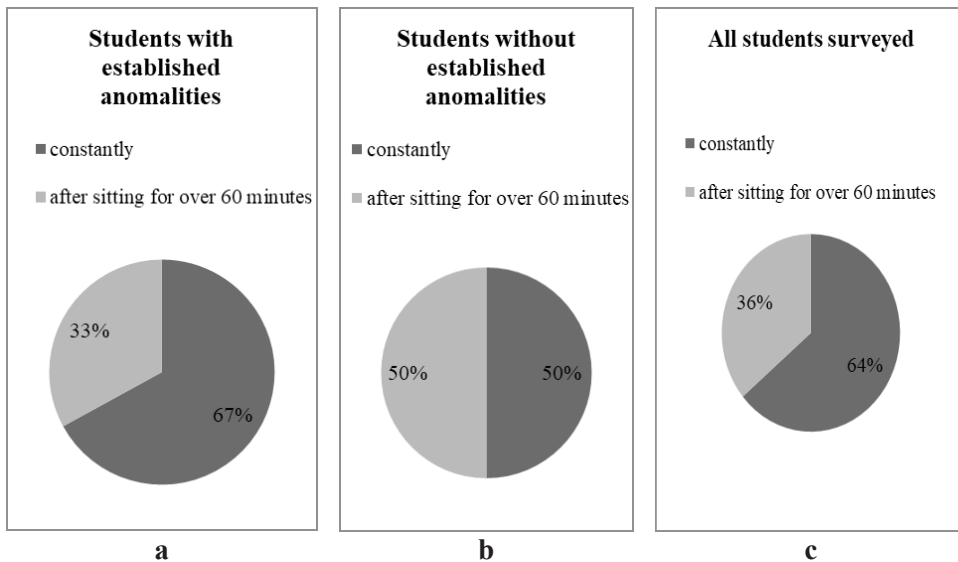
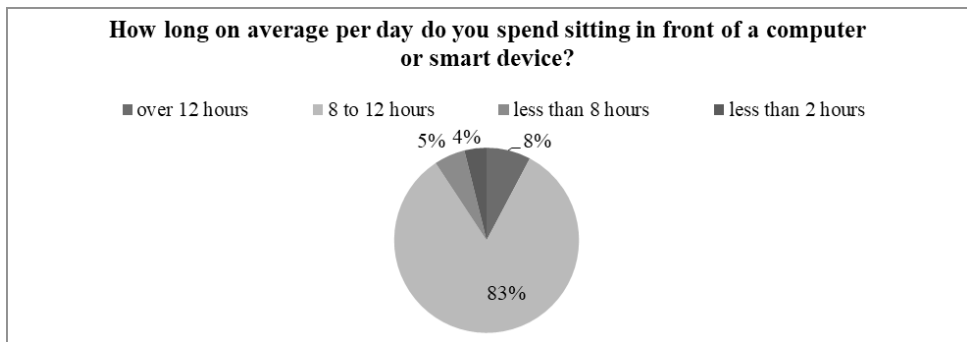


Figure 2

Of all individuals surveyed, 64% showed constant discomfort and the remaining 36% after a long sitting in a wrong posture. It is noticeable, that half of those who do

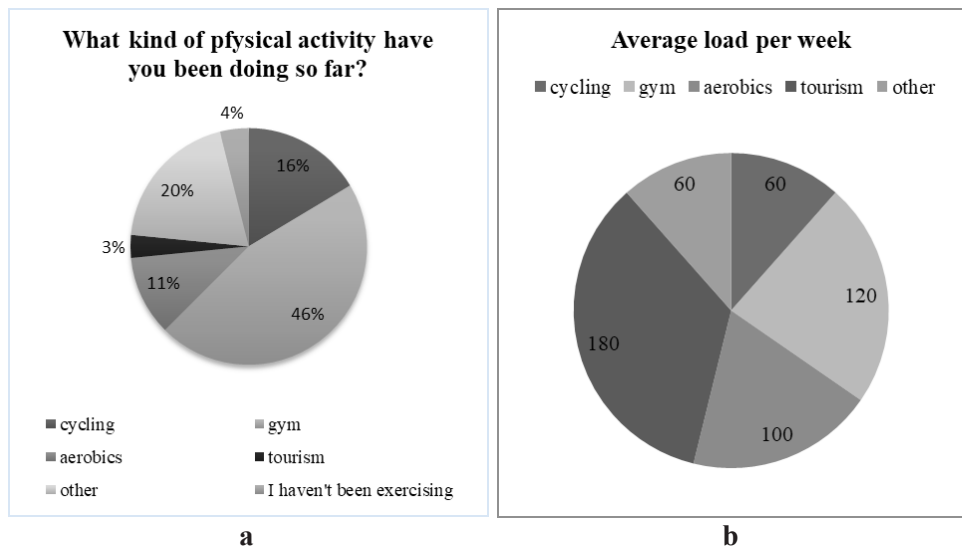
not have pre-established abnormalities also experience constant pain or discomfort, and the rest feel so only after a long sitting in front of a device. (Figure 2 – a,b,c).

When asked "How long on average per day, do you spend sitting in front of a computer or smart device?", the answers are of great concern – 91% spend more than 8 hours in front of modern technologies, less than 8 hours only 5%, no more than 2 hours – only 4%. A time when the posture is wrong (Figure 3).



**Figure 3**

To the question “What kind of physical activity have you been doing before you went to university and on average how many hours per week?”, the answers were:



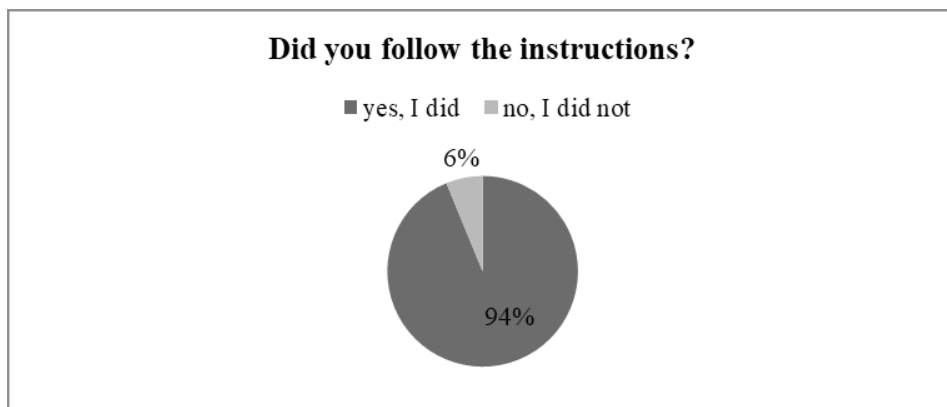
**Figure 4**

- Cycling – 16% of the surveyed with an average load of 60 minutes per week;
- Gym workout – 46% with an average load of 120 minutes per week;
- Aerobics – 11% of the students with an average load of 100 minutes per week;
- Tourism – 3% with an average load of 180 minutes per week;
- Other physical activities – 20% with an average load of 60 minutes per week;
- I have never exercised – 4% (Figure 4, a, b).

This data gives us the information that except for those 4%, the persons surveyed do not suffer from hypodynamia. The level of their physical activity is not high, but it is still present. However, pain and discomfort in the musculoskeletal system are observed.

**Poll 2** (conducted at the end of the winter semester of 2019 – 2020 academic year)

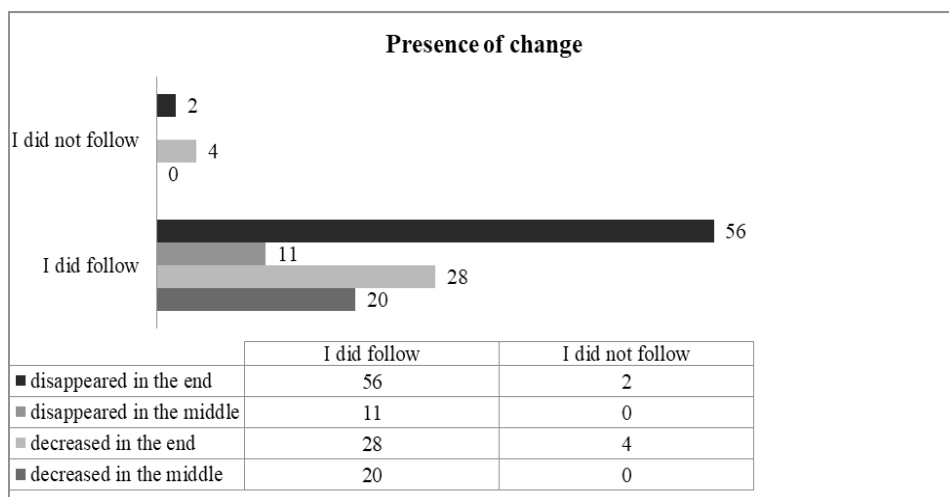
When asked “Did you regularly attend swimming classes (up to 3 absences per semester and additional swims according to the instruction)” – “Yes” were the answers of 121 people – 94% of the persons surveyed, 8 people (6%) did not follow the instruction and still swam, but less often (Figure 5).



**Figure 5**

To the question “Do you find a change in the feeling of pain or discomfort in the waist, back or neck?”, the answer “Yes” is followed with sub-answers such as: when – in the middle or in the end of the experiment?

- The pains decreased;
- The pains completely disappeared (Figure 6).

**Figure 6**

127 people of the respondents answered positively (only two were negative), and it is noticeable that for 11 students the pain disappeared already in the middle, and for 58 of them, disappeared completely at the end of the experiment (56 of them swam regularly and 2 irregularly). For the rest of the students there was a decrease in the negative sensations – for 20 in the middle and for another 30 who detected a positive change, without completely disappearing discomfort or pain in the problem areas, at the end of the experiment (of them 28 swam regularly and 4 did not follow the instruction).

### 3. Conclusions

Based on the research, were formed the conclusions that provide general guidance for the conduction of prevention and health support for young people in order to improve their quality of life. Introducing a programme for raising awareness of the harm and consequences of long sitting in the wrong position in front of computers thus avoiding developing dependence on the use of modern technologies and counteracting them through the means of swimming, is mandatory.

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