

LITERACY OF RECREATIONAL ATHLETES ABOUT THE INFLUENCE OF THE ENVIRONMENT ON HEALTH AND PHYSICAL ACTIVITY

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Abstrakt

Environmental literacy should be an important part of every state's strategy. It has been shown that the environmental burden caused by various contaminants gradually influences not only the overall health of the population through the occurrence of various chronic diseases but also limits the possibility of various outdoor physical activities. The aim of the presented study is to analyse the knowledge of recreational athletes about the issue of environmental risks, including contaminants affecting the environment in the Slovak Republic, their effect on health and physical activities. The partial goal was to analyse the interest of recreational athletes in education in the given issue. The findings present an interesting overall view of recreational athletes on a currently still understudied issue. This study can provide an initial insight into the issue for further investigation in the future. With regards to living conditions, environment, health, and physical activity, it is necessary to ponder and first of all to understand the relationship "state - cause - consequence".

Keywords: *Environmental literacy, living conditions, health, environment, physical activity, symbiosis*

1. INTRODUCTION

Living conditions, including all environmental factors about public health, are understood in the current over-technological times as a complex of interactions and genetic characteristics of a person and the environment in which they live. Environmental pollution is a highly discussed topic in the world. It is a phenomenon that affects the entire world as well as people not only in terms of health but also the possibility of enjoying sports in the natural environment. The right to a favourable environment is also stated in Article 44 of the Constitution of the Slovak Republic. "Everyone has the right to a favourable environment, everyone is obliged to protect and improve the environment and cultural heritage, and no one may threaten or damage the environment and its resources beyond the extent established by law". A clean environment is therefore a key determinant of health and the existence of a healthy society. It should be

remembered that environmental problems in the 21st century are already taking on a global character, including in Slovakia.

Physical activity and the environment

Physical activity in symbiosis with the natural environment (NE) is a very complex, still little-researched problem. However, there is no doubt that they mutually influence each other (Liba et al., 2012) define physical activity as a multifaceted movement activity of a person, or any form of movement characterized by human attributes such as purposefulness, social determination, cooperativeness, coordination, and others. However, it should be noted that performing physical activity outdoors depends primarily on a "healthy" natural environment" (Bama, 2015). There is also no doubt that in almost all sports it is important to become familiar with the natural environment, to be engaged, and to develop knowledge and appreciation of natural processes, including the

characteristics of the factors occurring in the natural environment - water, soil, air, weather, snow conditions, etc. (Cerezo-Esteve et al., 2022; Orr & Inoe, 2019; Orr et al., 2022).

Sports managers and participants in various sports events have taken a clean environment for granted for generations. Performing physical activity in the natural environment only emphasizes the key role - the necessity of preserving a healthy planet. Water quality, air quality, climate change, and other factors have a direct impact not only on the physical activity itself but first of all on the health of the individual and the population. Although many recreational as well as elite athletes perform physical activity in an outdoor environment, most of them perform it in a city, usually in a very densely populated area, often associated with a high level of pollution. There are studies related to increased air pollution and thus, negative consequences on the health of athletes during major sporting events (2006 Turin Olympics, 2010 Delhi Commonwealth Games, 2003-2004 English Football Cup Finals, etc.), (Bama, 2015; Orr & Inoe, 2019).

The Sports for Nature framework aims to implement transformative, nature-positive measures in sports by 2030, which will make it possible to promote physical activity in nature and at the same time contribute not only to the protection of nature and the environment itself but also to the protection of health. Back in 1995, Juan António Samaranch issued a statement: "The International Olympic Committee is determined to ensure that the environment becomes the third dimension in the organization of the Olympic Games" where the first dimension is sport, the second culture. This is also why the most significant progress in this field in the 21st century account for new, added relationships, namely the state of the environment in

connection with physical activity and health. It points to the importance of being informed - where, how, and why an adult individual, athlete, or collectives perform physical activity in an outdoor environment. The fact that in recent years the connections of "green and clean" areas, places, and cities, but also the "green sports movement" have been brought to the fore can be considered positive. In the modern understanding of the 21st century, the "green path" can therefore be a sign of the path to improving life itself, the path to longevity, the path to healthy physical activity, and the field of scientific research (Bowler et al., 2010; Eštoková, 2010; Trojčák, 2022; NCZI, 2022).

The impact of a polluted environment on the health of recreational athletes

Health can be defined as a basic source and prerequisite for optimal functioning of the organism, it is the basis for the prosperous and fulfilling life of every individual (Cimboláková et al., 2019). The relationship between the NE and human health, the so-called "environmental health" is a term of the 21st century and must be understood as a complex between a person's genetic characteristics and the environment in which the individual lives. Exposure of the population, including sports-active individuals and sports teams to harmful substances present in all components of the environment is a significant trigger for the development of chronic diseases (Cimboláková et al., 2021; Halzlová, 2016) and non-communicable diseases (metabolic, cardiovascular, psychological, tumor and neurological), which unnecessarily reduce years spent in health, well-being and subsequent decline in the possibility of performing sports activities (Giroir et al., 2018; Kondáš, 2011; Meško, 2006). Review studies have been increasingly analysing different NE areas which influence humans. Research with concrete results in the field of physiological, physical health,

mental and cognitive processes, social field, and other influences has been confirmed. As a result of global development, people's health has become a neglected but increasingly significant problem in the 21st century. If timely and effective strategies are not implemented, the changing health patterns of the population can undermine the health of future generations as well (Mokdad et al. 2016; NCZI, 2022; NCZISK, 2019; Tran et al., 2022).

The Lancet Commission on Pollution and Health reports that a polluted environment is responsible for nearly 9 million premature deaths, equivalent to one in six deaths worldwide. This estimate was updated using data from the Global Burden of Diseases, Injuries, and Risk Factors Study 2019 (Bama, 2015; Cimboláková et al., 2021; Cimboláková & Pavolová, 2020). As a result of the presence and action of risk factors in the NE, the number of deaths has increased by 7% since 2015, from 2020 it is more than 66 %, which can be considered an alarming figure (Fuller et al., 2022). Many of the pollutants that are known to affect human health are under regulatory control, but there are lengthy discussions about their long-term (chronic) effects on the body. In addition, persistent chemical substances can accumulate in human tissue and cause negative health effects during long-term exposure. An example can be perfluoroalkyl substances (PFAS). This is a group of almost 5,000 commonly used chemicals that can accumulate over time in the human population and the environment. They are an example of persistent organic pollutants also called "forever chemicals". They are an extremely difficult group of degradable chemicals which, in addition to occurring in the environment, are used in products due to their ability to increase the repellency of oils, and water or ability to withstand high temperatures. According to some estimates, about 6% of diseases, including

chronic diseases, cancer, neurological and developmental disorders, and 8% of deaths in the world. Moreover, these numbers could be growing, taking into account only a small number of chemicals whose effects on health are verified (EEA, 2019; 2020). This is also why the most significant progress in this field in the 21st century is new, added relationships, namely the state of the environment in connection with physical activity and health. It points to the importance of being informed - where, how, and why an adult individual, athlete, or collectives perform physical activity in an outdoor environment as there is still little information and discussion about possible negative effects of, for example, polluted air and water at a given time. Healthy living conditions are among the basic factors in maintaining the quality of life, health, and the very future existence of a healthy society (Cimboláková, 2021A; NCZI, 2022).

2. AIM

This study aimed to analyse and expand knowledge about recreational athletes' awareness of issues related to environmental risks, including contaminants affecting the environment in the Slovak Republic (SR), their impact on health, and physical activity. Furthermore, this study aimed to examine the athletes' interest in education in the given issue. Respondents were informed in advance about the anonymity of the questionnaire and agreed to fill it out in advance.

3. METHODS

3.1 Sample, procedure

The sample consisted of 79 respondents (49 women and 30 men) and we excluded respondents who did not meet the criteria for inclusion since they did not identify as recreational athletes. 72 respondents (91

%) were included in this group. We could not utilise the data received from the other 7 respondents (9 %) in our research. Subjects came from the Slovak Republic, mostly from the Eastern Slovakia. All respondents were informed in advance about the anonymity of the questionnaire and agreed to fill it out in advance, including voluntary participation, informed consent, anonymity, confidentiality, potential for harm, and communication of results. The researchers always followed the ethical code of conduct when collecting data of respondents.

The sample mostly consisted of subjects who identified as employed (54 %), university students (32 %), secondary school students (10 %), and the unemployed group accounted for 4 %. Most respondents reported an age between 19 and 25 (45.5 %).

3.2 Diagnostics

The online questionnaire was used to examine the recreational athletes' awareness of the state of the natural environment, its impact on health, and their interest in the environment where they perform physical activity. All subjects granted their approval for processing the data.

Selected multiple-choice questions were used for this publication:

1. Where do recreational athletes most often exercise?
2. Are the respondents interested in

whether the area in which they exercise meets the

3. requirements for healthy "sports"?
4. Are the respondents sufficiently informed about the possible effects of a pollutedthe environment on their health?
5. environment on their health?
6. According to the respondents, which specific environmental risk factors have the most adverse effect on health and physical activity?
7. Would the respondents accept more information in the form of lectures, workshops on the topic of the possible negative effects of a polluted environment on the body?

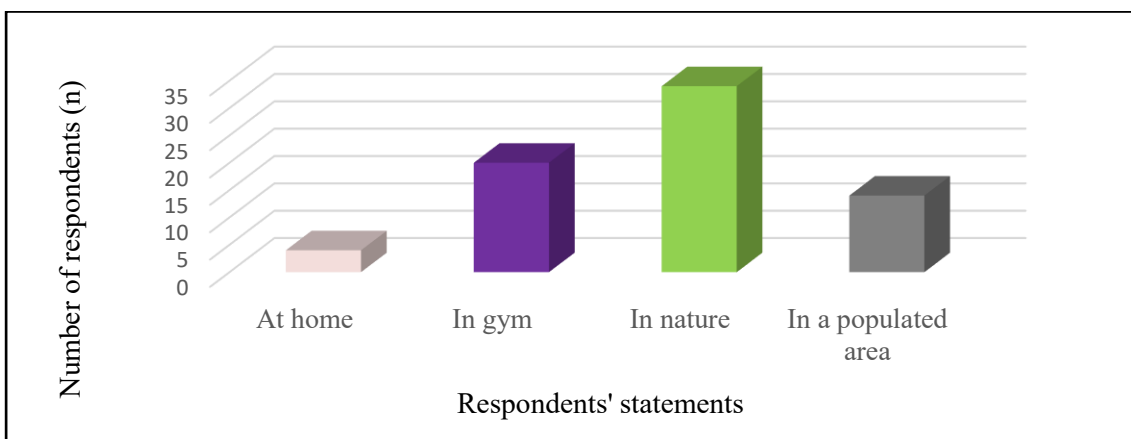
3.3 Statistics

Data were processed using basic mathematical statistical methods in Microsoft Office Excel and we used SmartArt graphics for the visualisation of our results.

4. RESULTS AND DISCUSSION

Regarding the first question in our survey where we examined both genders together (males, females) we found that 34 respondents (both genders) perform sports activities outdoors. 20 respondents do sports in the gym and 14 respondents do sports in a populated area – streets, roads, or in another built-up area. Only 4 respondents indicated that they like to do sports at home. The overall evaluation is shown in Fig. 1.

Fig.1 Place of sports activity (n=72; 42 males, 30 females)

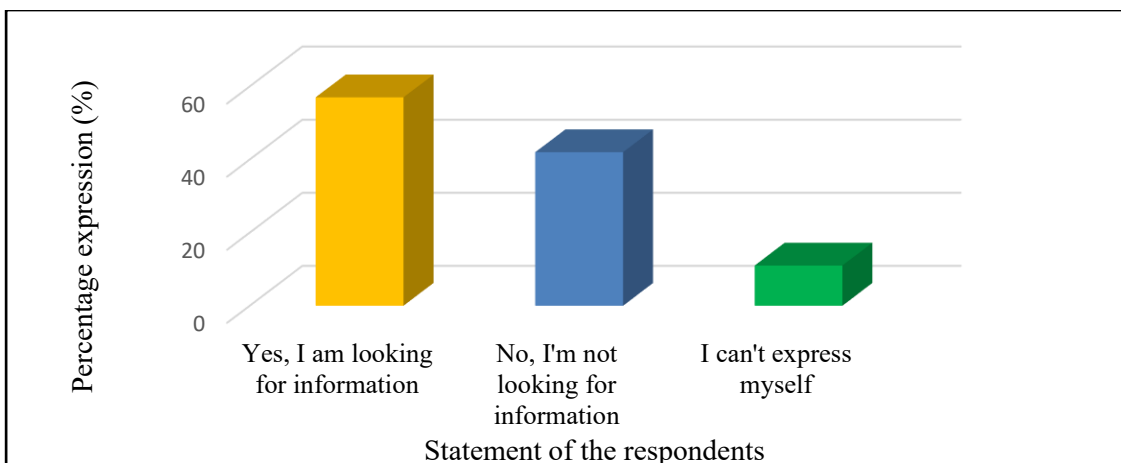


Source: own processing

The importance of physical activity in a non-contaminated environment is already being significantly recognized not only by scientists but also by the general public. That is why we were interested in whether the respondents are interested in the state of the environment in which they exercise.

More than half of the respondents (57 %) are interested in this issue and try to do sports in places that are as least polluted as possible. Less than half (42 %) of respondents do not search for this information. The overall evaluation is shown in Fig. 2.

Fig. 2 Literacy of the respondents - state of the environment (n=72; 42 males, 30 females)



Source: own processing

In a study by Thompson et al. (2011), Hartig (2003) it was found that physical activity in a clean environment was associated with reduced feelings of tension, confusion, anger, and depression while showing greater feelings of revitalization. Research on restorative environments reveals that the natural environment can promote psychological well-being by

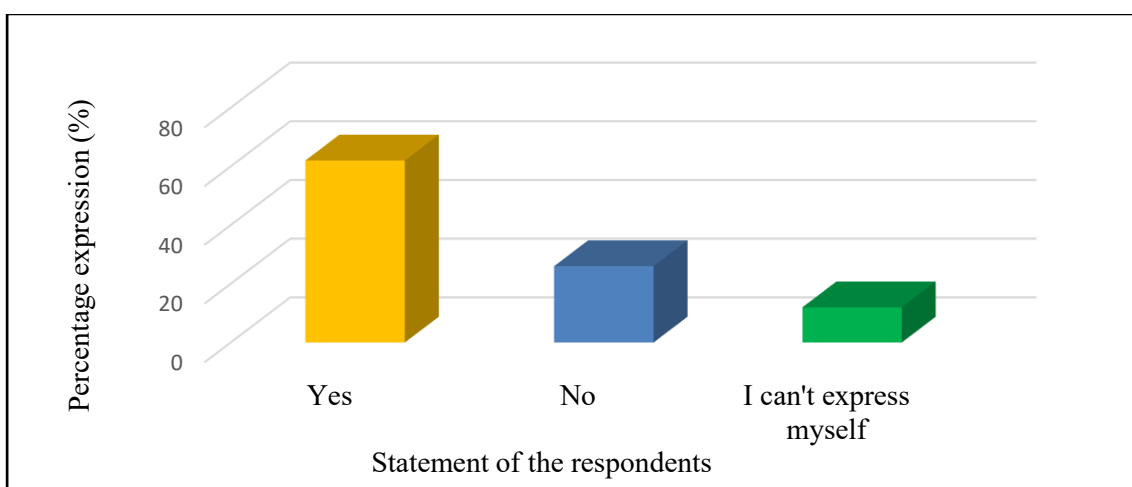
reducing psychophysical stress, inducing positive emotions, and facilitating the renewal of cognitive resources.

Many studies of psychological recovery in nature refer to evolutionary explanations that human beings evolved in natural environments and developed an innate tendency to respond positively to natural

environments. The results of our research partially correspond with the results of a 2019 study that examined high school students' awareness of the state of the environment in Indonesia. Up to 64.13 % of respondents showed sufficient environmental awareness; almost 6 % of respondents were very well aware of the state of the environment. However, awareness of almost 30% of respondents was at a very low level (Amran et al., 2019).

In the question in which examined whether the respondents had information about the health risks that threaten them when performing sports activities in a polluted environment, 62 % of the respondents answered positively, but up to 12 % of the respondents could not express themselves at all, which we see as negative. The overall evaluation is shown in Fig. 3.

Fig.3 Literacy of respondents about health risks when exercising (n=72; 42 males, 30 females)



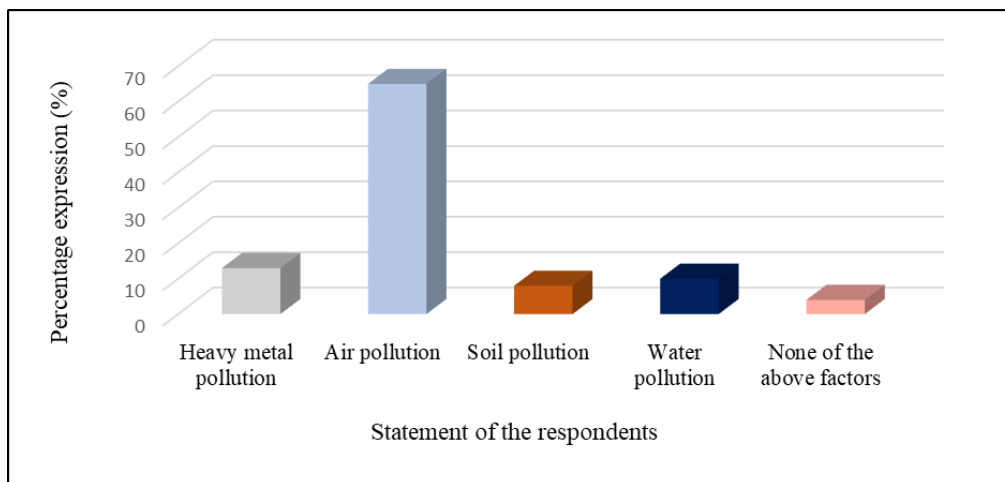
Source: own processing

Semrádová (2021) suggests that there is a very close connection between polluted environment and immunity, with a negative impact on the overall health of individuals up to 25 %. Studies conducted in areas with poor air quality in California proved that the incidence of respiratory diseases such as asthma is 3 times higher in the population that actively performs physical activity than in the population that does not perform any physical activity. This finding is more than alarming and calls for a solution. Concerns are also growing about the risk of illness when resting on

the coast of the sea, due to its pollution and water contamination (Kalinkin, 2011).

We were also interested in which environmental risk factors the respondents consider to have the most adverse effect on their health. More than 65 % are mainly concerned about polluted air. We consider the answer of 4 % of respondents as a negative, who stated that none of the mentioned factors pose a risk for them and they have nothing to worry about. The overall evaluation is shown in Fig. 4.

Fig. 4 Environmental pollution factors considered by respondents to have the most adverse effect on their health (n=72; 42 males, 30 females)



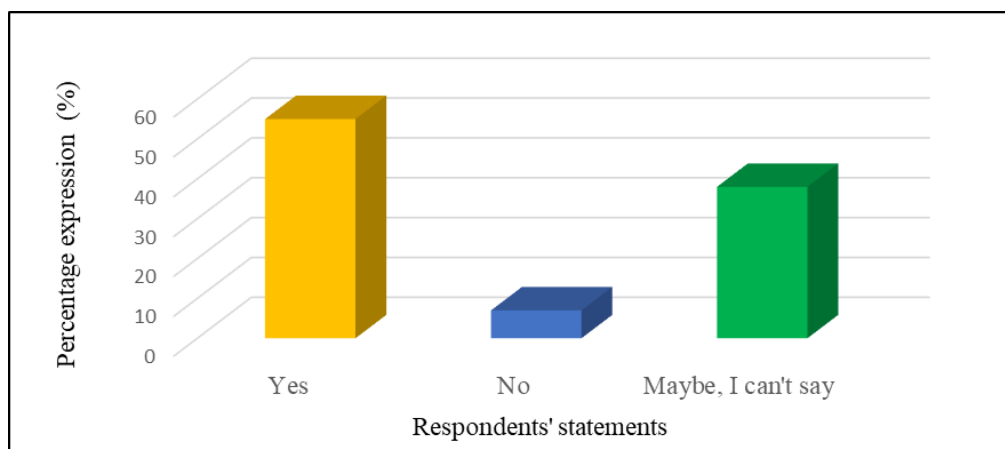
Source: own processing

A healthy environment and the space in which we live is one of the main determinants of human health. Based on estimates by the World Health Organization (WHO), almost every fourth death in the world is linked to the negative impact of a polluted environment on human health. Environmental burdens also include water and soil pollution, exposure to chemicals and heavy metals, and climate change. All these burdens significantly contribute to the development of cardiovascular diseases, and diseases of the digestive and respiratory systems. The influence of heavy metals on the body

causes serious oncological diseases. However, the problem of the negative impact of a polluted environment on human health persists despite the measures taken (Kuriaková, 2018).

As part of the question of whether the respondents would accept more information about the polluted environment through lectures, workshops, or social networks, 55 % of the respondents expressed positively in the given question. Only 7 % of the respondents say that they are not at all interested in education in this area. The overall evaluation is shown in Fig. 5.

Fig. 5 Demand of the respondents for education in the analysed issue (n=72; 42 males, 30 females)



Source: own processing

The results partially correspond with the results of the author Schwartzstein (2020), who claims that until recently interest in education in this field was at a low level. The deteriorating climate has increased the interest in education in this issue, which was also confirmed by our survey. We can compare our survey with a survey that was conducted on a representative sample of 1,000 respondents and was focused on the interest of Slovak residents in improving the climate in the territory of the European Union. The results clearly show that the Slovaks definitely expect measures to be taken in the fight against climate change. As many as 73 % of the respondents expressed an interest in this issue and consider waste separation and reducing the use of automobile transport to be the most important. This can eventually lead to an improvement in air in the Slovak Republic.

The environmental burden caused by various pollutants (contaminants) in the individual components of the NE increasingly influences the overall health status of the entire population, and especially from a time point of view the occurrence of various chronic diseases. More and more often we come across declarations of emergencies in the Slovak Republic (in 2020 the Ministry of the Interior of the Slovak Republic – emergency of Chemko Strážske, 23.6.2023 emergency of increased ground-level ozone in the city of Bratislava, etc.). Therefore, to improve the environmental literacy of recreational athletes it is necessary to raise awareness, presentation, and visibility of the problem for example by improving media coverage as well as improving education in this field (Gupko, 2023).

5. CONCLUSIONS

Our research has provided an interesting insight into the issue. The main contribution of this study lies in the overall

insight – recreational athletes' literacy in this field. Environmental problems and their impact on human health are also declared in the "Report on the Evaluation of the Strategic Document Operational Programme Slovakia 2021-2027". Also "Envirostrategy of Slovakia until 2030", states that the Slovak Republic faces many challenges, which points out the importance of solving environmental problems.

Data processed by the Slovak Hydrometeorological Institute (SHMÚ) as well as interim reports on the state of the NE also indicate that air pollution is the most significant contributor to the adverse effect of the NE on the health of the population, which was also confirmed in our research. Our findings suggest that despite the acceptable awareness of adults about the NE, they are not interested in the state of the NE in general, only in the case of performing outdoor activities. The overall awareness of the impact on their health is at a good level, even though, according to the results, the level of awareness of adults of the state of the NE is relatively low. The study can provide an initial insight for the future investigation of the given issue. With regards to living conditions, environment, and health, it is necessary to think about and understand the "state-cause-effect" relationship.

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