PHYSICAL EDUCATION OF STUDENTS

ORIGINAL ARTICLE

Outdoor and indoor sports preferences of students in relation to their pro-environmental behaviour

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Abstract

Background and Study Aim: There is strong evidence linking outdoor physical activity with health benefits, but little is known about its impact on pro-environmental behaviour. Therefore, this study seeks to clarify this research problem.

Material and Methods: We assessed pro-environmental behaviour in a group of 170 students (aged 21.79 ± 1.23) of the Academy of Physical Education and Sport who declared stronger attachment to one of the two forms of physical activity: outdoor or indoor. The analysis of the strength of pro-environmental attitudes was conducted using the Environmental Health Literacy (EHL) Scale.

Results: Despite the lack of spectacular differences between the attitudes of students from the outdoor and indoor physical activity groups, a few dissimilarities related to air quality were noticed. Each of them indicated stronger pro-environmental behaviour of representatives of the outdoor physical activity group. They concerned the following issues: I avoid exercising because of pollution ($p < 0.05$), I avoid opening my window due to poor outdoor air quality ($p < 0.05$), I avoid inhaling car exhaust ($p < 0.05$), I avoid exposing myself and family members to harmful chemicals ($p < 0.001$). Similar results were obtained by dividing into male outdoor / indoor physical activity and female outdoor / indoor physical activity. Gender turned out to be a factor that differentiates pro-environmental behaviour to a much smaller extent. Opinions regarding only one statement indicated in favor of female subjects.

Conclusions: Outdoor physical activity seems to be the reason for deeper pro-environmental reflection with respect to aerosanitary conditions, probably due to the awareness of health stress caused by exercising in polluted air.

Keywords: outdoor, indoor, physical activity, pro-environmental, behaviour

Introduction

Physical activity conducted in natural environments is discussed in the context of a synergistic health effect, caused by both physical activity and natural environment. The benefits of outdoor sports, which often go beyond exercising in indoor sports facilities, are emphasized [1]. The term sport is in this case devoid of its original meaning, referring to the professional formula, and used interchangeably with physical activity, referring to an inclusive, broad definition proposed in 1992 by the Council of Europe [2].

In addition to the health-promoting effects of physical activity and nature, outdoor sports are also associated with social benefits, including interpersonal development and civic activity [3], which can be understood as, among others, pro-environmental behaviour. The term "pro-environmental behaviour" is often interpreted as pro-social behaviour, but in this study the authors will focus on its pro-ecological dimension.

In the period of individual development, experiences gained as a result of interaction with the environment may have a significant impact on the perception of it by humans [4]. Outdoor exercise and environmentalism are two related phenomena. From a historical point of view, they have clear similarities, namely, they were both established at the beginning of the last century, were inspired by the Romantic movement and were a reaction to the elements of a modern, industrialized and urbanized society [5]. Therefore, from the very beginning, outdoor recreation has been a place of refuge for people representing an ecological personality profile and expressing the ideal of a human being integrated with nature [6].

Younger people tend to have more positive experiences in their natural environments than adults as they are not used to the transformed environment yet. Research has also shown that development towards pro-environmental awareness should be supported through regular personal participation and interaction with various types of the natural environment [7-9]. During the COVID-19 pandemic, the possibilities of outdoor physical activity have been significantly limited [10]. The decline in modern human mobility is also treated as an element of the commonly accepted lifestyle [11]. Physical inactivity has been identified

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as the fourth leading risk factor for mortality worldwide [12]. Natural places for outdoor activities are also becoming more and more difficult to access due to the dynamically progressing urbanization process [13]. Therefore, an increasingly urgent need is their planning and management, aimed at, apart from increasing recreational opportunities, also promoting health in conditions of isolation from industrial and transport pollution [14].

There is evidence of a close relationship between health enhancement and physical activity [15]. However, very few studies have attempted to link these two areas of physical activity and pro-environmental behavior and investigate their relationship [16]. That is why, the main aim of this study is to fill this gap by examining in particular the influence of outdoor physical activity on environmental behaviour.

Material and methods

Participants.

The research was conducted among 170 students (age 21.79 ± 1.23) of Tourism and Recreation of Gdansk University of Physical Education and Sport (Poland). The outdoor athletes were represented by 93 subjects and there were 77 people declaring themselves indoor athletes. The study group consisted of 80 men and 90 women. There were 45 men declaring participation in outdoor physical activity, while the group of men - indoor athletes consisted of 35 subjects. The study included 48 female outdoor athletes and 42 female indoor athletes.

Research design.

The research method was a diagnostic survey with the questionnaire technique. The research tool was the Environmental Health Literacy (EHL) questionnaire, assessing the level of understanding and using information about the environment to make decisions about one's own health [17]. The Research Instrument consists of four subscales - Air, Food, Water and General EH Scale. Among three domains of the questionnaire, which were knowledge, attitudes and behaviour, only the last of these domains was used. Behaviour items have a five-point frequency scale of always (5), often (4), sometimes, (3), hardly ever (2), and never (1).

Air Scale

I have had my indoor air tested.

I use face masks when cleaning my house.

I avoid exercising because of pollution.

I avoid opening my window due to poor outdoor air quality.

Food Scale

I use separate clean utensils to handle raw and fresh items while cooking.

I use utensils to handle food that is ready to eat.

Water Scale

I only use the dishwasher when I have a full load.

I only wash clothes when I have a full load.

I pay attention to how much time I spend in the shower in an effort to conserve water.

I track water usage monthly using my water bill.

I comply with instructions when a boil water advisory is issued by the city.

I turn off the tap water while brushing my teeth.

I do not open the tap all the way while washing dishes.

General environmental health scale

I avoid inhaling car exhaust.

I avoid inhaling cleaning products.

I avoid exposing myself and family members to harmful chemicals.

Statistical Analysis.

The statistical significance of the differences between responses by outdoor and indoor athletes, men and women, male outdoor and indoor athletes as well as female outdoor and indoor athletes, was assessed by means of student's t-test. The results are presented as means with standard deviation and $p<0.05$ was considered statistically significant.

Results

Out of 16 items including 4 scales of consciousness, in 4 cases statistically significant disparities in favour of outdoor athletes were observed. They concerned the following statements: I avoid exercising because of pollution, I avoid opening my window due to poor outdoor air quality, I avoid inhaling car exhaust, I avoid exposing myself and family members to harmful chemicals. The results of the study are presented in Table 1.

Among 16 items including 4 scales of consciousness, only one case revealed statistically significant difference in favour of women. It concerned the statement: I turn off the tap water while brushing my teeth. The study results are displayed in Table 2.

Among 16 items including 4 scales of consciousness, in 3 cases statistically significant differences were identified in favour of male outdoor athletes. They concerned the following statements: I avoid exercising because of pollution, I avoid inhaling car exhaust, I avoid exposing myself and family members to harmful chemicals. The study results are presented in Table 3.

Among 16 items including 4 scales of consciousness, in 3 cases statistically significant differences were identified in favour of female outdoor athletes. They concerned the following statements: I avoid opening my window due to poor outdoor air quality, I avoid inhaling car exhaust, I avoid exposing myself and family members to harmful chemicals. The results are presented in Table 4.

Table 1. Behaviours declared by outdoor and indoor athletes within Environmental Health Literacy

Item	Outdoor athletes (n = 93)	Indoor athletes (n = 77)	t	p
	Mean±SD	Mean±SD		
Air Scale				
1.	1.45±0.89	1.51±1.04	-0.45	0.648
2.	1.21±0.52	1.31±0.65	-1.06	0.288
3.	2.38±1.11	1.97±1.15	2.36	0.019*
4.	2.62±1.25	2.19±1.34	2.14	0.033*
Food Scale				
1.	4.24±1.13	4.23±1.14	0.07	0.938
2.	4.00±1.18	3.77±1.28	1.16	0.246
Water Scale				
1.	4.53±0.89	4.33±0.99	1.38	0.169
2.	4.36±0.83	4.16±0.99	1.40	0.161
3.	3.07±1.21	2.90±1.38	0.83	0.407
4.	2.64±1.38	2.37±1.30	1.29	0.197
5.	3.59±1.07	3.36±1.07	1.37	0.171
6.	4.24±1.00	4.28±0.97	-0.25	0.801
7.	3.72±1.24	3.72±1.25	-0.03	0.971
General Environmental Health Scale				
1.	4.08±0.99	3.58±1.15	3.04	0.002*
2.	4.09±0.89	3.83±1.01	1.80	0.072
3.	4.52±0.71	4.02±0.93	3.96	0.000**

Table 2. Behaviour declared by men and women within Environmental Health Literacy

Item	Men (n = 80)	Women (n = 90)	t	p
	Mean±SD	Mean±SD		
Air Scale				
1.	1.42±0.91	1.53±1.00	-0.73	0.465
2.	1.23±0.55	1.27±0.61	-0.44	0.657
3.	2.36±1.19	2.05±1.09	1.74	0.082
4.	2.45±1.43	2.41±1.20	0.19	0.847
Food Scale				
1.	4.22±1.17	4.25±1.10	-0.17	0.861
2.	3.85±1.13	3.94±1.31	-0.49	0.619
Water Scale				
1.	4.33±1.01	4.54±0.86	-1.43	0.153
2.	4.17±0.99	4.36±0.82	-1.37	0.171
3.	2.80±1.25	3.17±1.31	-1.91	0.057
4.	2.47±1.44	2.56±1.27	-0.44	0.660
5.	3.40±1.10	3.56±1.04	-1.00	0.315
6.	3.90±1.08	4.58±0.76	-4.82	0.000**
7.	3.72±1.25	3.72±1.24	0.01	0.988
General Environmental Health Scale				
1.	3.91±1.11	3.81±1.07	0.60	0.548
2.	4.10±0.89	3.86±1.00	1.58	0.114
3.	4.33±0.85	4.26±0.85	0.53	0.591

Table 3. Behaviour declared by male outdoor athletes and male indoor athletes within Environmental Health Literacy

Item	Male outdoor athletes (n = 45)	Male indoor athletes (n = 35)	t	p
	Mean±SD	Mean±SD		
Air Scale				
1.	1.37±0.83	1.48±1.01	-0.52	0.602
2.	1.22±0.55	1.25±0.56	-0.27	0.782
3.	2.68±1.06	1.94±1.23	2.90	0.004*
4.	2.60±1.43	2.25±1.42	1.06	0.290
Food Scale				
1.	4.33±1.12	4.08±1.24	0.93	0.354
2.	3.95±1.12	3.71±1.15	0.94	0.349
Water Scale				
1.	4.35±1.09	4.31±0.93	0.17	0.858
2.	4.20±0.96	4.14±1.03	0.25	0.799
3.	2.93±1.26	2.62±1.23	1.07	0.284
4.	2.71±1.51	2.17±1.29	1.68	0.096
5.	3.44±1.17	3.34±1.02	0.40	0.687
6.	3.91±1.08	3.88±1.10	0.10	0.918
7.	3.68±1.27	3.77±1.23	-0.29	0.772
General Environmental Health Scale				
1.	4.15±0.90	3.60±1.28	2.26	0.026*
2.	4.20±0.84	3.97±0.95	1.13	0.259
3.	4.55±0.69	4.05±0.96	2.68	0.008*

Table 4. Behaviour declared by female outdoor athletes and female indoor athletes within Environmental Health Literacy

Item	Female outdoor athletes (n = 48)	Female indoor athletes (n = 42)	t	p
	Mean±SD	Mean±SD		
Air Scale				
1.	1.52±0.94	1.54±1.08	0.12	0.900
2.	1.20±0.50	1.35±0.72	1.14	0.257
3.	2.10±1.09	2.00±1.10	-0.44	0.655
4.	2.64±1.08	2.14±1.29	-2.00	0.048*
Food Scale				
1.	4.16±1.15	4.35±1.05	0.81	0.418
2.	4.04±1.25	3.83±1.39	-0.74	0.457
Water Scale				
1.	4.70±0.61	4.35±1.05	-1.95	0.053
2.	4.52±0.65	4.19±0.96	-1.91	0.058
3.	3.20±1.16	3.14±1.47	-0.23	0.814
4.	2.58±1.25	2.54±1.31	-0.13	0.895
5.	3.72±0.96	3.38±1.12	-1.58	0.117
6.	4.56±0.82	4.61±0.69	0.34	0.727
7.	3.75±1.22	3.69±1.27	-0.22	0.822
General Environmental Health Scale				
1.	4.02±1.08	3.57±1.03	-2.00	0.048*
2.	4.00±0.94	3.71±1.06	-1.34	0.181
3.	4.50±0.74	4.00±0.91	-2.86	0.005*

Discussion

Extending the time spent in the natural environment may lead to a greater tendency towards environmental and ethical behaviour [18]. The same may apply to people who are close to nature through sports activities [19]. This contact and ensuing better understanding of the relationship with the natural environment and human dependence on it can be considered a key aspect of outdoor physical activity. In this case, pro-environmental awareness is strengthened both in terms of attitudes and behavior [20, 21]. Outdoor physical activity is perceived as an important tool for environmental education, as it can go beyond traditional knowledge transfer. Consequently, it has the potential to enhance environmental behavior in the context of situational and experiential learning [22]. It is an attractive and innovative method of attracting representatives of the younger generation to the topic of sustainable development with a lasting effect [23]. It should be emphasised, though, that only 7 out of 18 studies on this issue are based on quantitative data, and there is still a lack of studies that adequately assess the long-term effects found by practitioners [24].

The analysis results show that most of the issues differentiating opinions on pro-environmental behavior are related to air pollution. This dilemma seems to be more important for people undertaking outdoor physical activity in highly urbanized places. Air pollution levels observed in some agglomerations, revealing parameters similar to smog conditions, seem to prevail in terms of health impacts over problems caused by food or water pollution. So far, a lot of emphasis has been placed on these issues in the scientific literature [25-29].

Air quality can influence people's decisions about participating in outdoor activities. It has been shown, inter alia, that the concentration of ozone - an urban air pollution component which is hazardous to health, is associated with the number of visitors to US national parks. The authors found that the pollution of selected protected areas in this country is similar to many local metropolitan areas, and an increase in the maximum ozone concentration by 1-ppb is associated with a decrease in the monthly number of visits to the park by 1.6% [30]. On the other hand, the main factor influencing people's decisions to take part in outdoor activities does not have to be the concentration of air pollutants, but public interest in the problem. Therefore, timely and accurate information on pollution is as important as comprehensive monitoring [31].

Other results indicate that the frequency of resigning from outdoor activities increased under the influence of media alerts of air quality index warnings to 31% in adults with asthma compared to 16% in people without asthma [32]. It should be mentioned, however, that these studies were based mainly on subjective survey data with a limited temporal and spatial scope. On the other hand, according to the authors' knowledge, none of the studies directly concerned the relationship between people's awareness of pollution and their decision to exercise outdoors.

Conclusions

The decision to choose the natural environment as a place of physical activity may be related to increased pro-environmental awareness. The declared pro-ecological behavior related to air pollution turned out to be significantly stronger among people exposed to possible contact with it during sports activities. These differences became apparent in the case of both sexes. Both among men and women, a stronger pro-environmental attitude related to the awareness of health risks from polluted air was observed in groups of people who are active outdoors. Against this background, it is difficult to unequivocally refer to the only significant difference between men and women without indicating the preferred place of activity. It concerned one of the Water Scale items and demonstrated greater awareness of women.

Conflict of interests

The authors have no conflict of interests to declare.

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