

ORIGINAL PAPER

**SELECTED HEALTH BEHAVIORS OF TOURISM AND RECREATION STUDENTS
FROM UNIVERSITY WSB MERITO OF WROCŁAW**

Agnieszka Augustyn^{1(A,B,C,D,E,F)}, Mateusz Ziemb^a^{2(E,F,G)}

¹Faculty of Finance and Management, WSB Merito University in Wrocław, Poland

²Faculty in Chorzów, WSB Merito University, Poznań, Poland

Augustyn A, Ziemb^a M. Selected health behaviors of tourism and recreation students from Wrocław.

Health Prob Civil. <https://doi.org/10.5114/hpc.2025.147771>

Tables: 8

Figures: 0

References: 75

Submitted: 2024 Nov 20

Accepted: 2025 Feb 13

Address for correspondence: Mateusz Ziemb^a, Faculty in Chorzów, WSB Merito University, Poznań, Sportowa 29, 41-506, Chorzów, Poland, e-mail: mateusz.ziemb^a@chorzow.wsb.pl, phone: +48 32 349 84 74

ORCID: Agnieszka Augustyn <https://orcid.org/0000-0003-1030-1352>, Mateusz Ziemb^a <https://orcid.org/0000-0003-1040-4466>

Copyright: © John Paul II University in Biała Podlaska, Agnieszka Augustyn, Mateusz Ziemb^a. This is an Open Access journal, all articles are distributed under the terms of the Creative Commons AttributionNonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) License (<https://creativecommons.org/licenses/by-nc-sa/4.0/>), allowing third parties to copy and redistribute the

material in any medium or format and to remix, transform, and build upon the material, provided the original work is properly cited and states its license.

Summary

Background. The aim of the study was to gain insight into the health-enhancing and health-risking behaviors of tourism and recreation students. The paper examines gender differences in the prevalence of dietary behaviors, sedentary behaviors, physical activity and the risk of tobacco smoking.

Material and methods. The study included 332 students at the University WSB Merito of Wrocław, Poland. The author's questionnaire was combined with a selection of questions used in Health Behavior in School-aged Children, a World Health Organization Collaborative Study.

Results. The survey showed positive behaviors: 53.3% of students ate breakfast daily, 43% consumed fruits, 37.3% ate vegetables, and most limited sweets (57.5%) and soft drinks (75%) to once a week. Around 51.5% engaged in physical activity five to six times weekly, with 13.6% exercising daily, averaging 45-60 minutes per session. Most (86.1%) hadn't smoked tobacco. However, 94.8% spent over two hours daily on screens, and less than 15% took breaks. Fast food remained popular, with 53.8% consuming it regularly.

Conclusions. The data showed gender differences: men exercised more, preferred longer workouts, spent less time on screens, ate breakfast daily, and consumed fewer sweets. Women smoked less, ate more fruits and vegetables, and consumed less fast food. Enhancing health education for students could help maximize health potential.

Keywords: health-enhancing behaviors, dietary behaviors, sedentary behaviors, physical activity, health,

Introduction

Studies centered around health behaviors are considered to be one of the most important methods for measuring the health of a population. They also provide the basis for planning and evaluation of health education, preventive programmes and health promotion projects [1-4]. It is worth emphasizing that health behaviors are not enduring practices. With multiple technological conveniences in place, people are ever more likely to eliminate physical effort from their everyday lives and change their eating habits, while also being far less inclined to take up actions to enhance their health [3,5-8].

People between the ages of 20 and 30 experience a particularly intense development of health behaviors [5,9]. University years mark a time when a young person's value system is formed, with those years being a perfect time for a person's sense of responsibility for their own health and that of others to be developed. This is especially so after graduating from the faculties whose students set an example for the broader public. Future tourism and recreation graduates should be fully aware of behaviors which foster, and those which endanger, health so that they can recover, strengthen and effectively improve people's health [10,11].

Referring to the criteria of an individual's state of consciousness and his or her sense of purpose, highlight the following behaviors: healthy behaviors (actions taken purposefully, intentionally and consciously to strengthen or maximize one's health potential) and health behaviors (habits or reactions to a certain situation, everyday life activities which can have positive and/or negative health effects) [4,12]. Habitual behaviors relating to health are considered to include personal hygiene activities, dietary behaviors, actions performed in situations in which basic safety rules need to be observed, sleep and rest habits, as well as habits in terms of the way people spend their free time and engage in physical activity [13].

Health behaviors can be examined on three planes of interaction. First, physical health; it includes physical activity, personal hygiene, balanced diet, avoiding stimulants such as tobacco, alcohol and drugs, “toughening up” to improve the body’s immune response to harmful stimuli and sleep. Second, mental health; it includes the ability to handle problems and stress, self-acceptance, self-confidence, optimism and having high self-esteem. Finally, social health, which encompasses the ability to develop proper social relationships, interpersonal relations within one’s family and a more broadly defined community [3,8,11,14,15].

Non-healthy behaviors are risky, negative, problematic and self-destructive behaviors. It covers any kind of behavior which is harmful, causing health degradation and debilitation, in other words, a behavior leading to the development of a disease [3,8,11,13-15].

Health-risk behaviors are those which endanger a person’s physical and mental health. They are also behaviors which fail to subscribe to social norms, contribute to health disorders and, thus, have a negative impact on physical, mental and social health. The most common health-risk behaviors include tobacco smoking, regular alcohol consumption, getting drunk, taking drugs and psychoactive medications, engaging in premature sexual activity, aggressive behavior, violence, minor offences, hooliganism, vandalism, neglecting compulsory education, truancy and running away from home. Insufficient positive health behaviors can also pose a risk to health, for example, when a person engages in harmful dietary habits or performs reduced or no physical activity at all [4,8,14,16,17]. One health-risk behavior increases the likelihood that other behaviors adverse to human health and development will occur as well.

Aim of the work

Identifying the scope of behaviors which enhance and those which endanger health among Wrocław academic youth was considered of key importance. Hence, the following

questions were posed: What is the percentage of tourism and recreation students reporting health-enhancing behaviors and what is the percentage reporting health-risk behaviors? Are there any differences in the prevalence of responses between men and women?

Material and methods

With a view to ensuring reliable and comprehensive investigation of the subject in question, a diagnostic survey technique, a questionnaire, was employed. The author's questionnaire was combined with the standardized questionnaire adopted in Health Behavior in School-aged Children: a WHO Collaborative Study (HSBC) [1].

The analysis of health-enhancing and health-risking behaviors was conducted based on the indicators used by the HBSC experts. For the purpose of the research sample, only a selection of questions and multiple-choice responses were used out of those employed while organizing the studies drawing on the HBSC 2010, 2014, 2018 reports. The analysis of the recommended moderate aerobic physical activity of at least 150 minutes a week for adults was based on the World Health Organization recommendations.

The current paper presents the survey results in the following areas:

Dietary behaviors:

- prevalence of breakfast consumption per week;
- prevalence of certain foods:
 - conducive to health – fruits and vegetables;
 - harmful to health – sweets, fast-foods, Coca-Cola or other soft drinks.

Physical activity:

- frequency of undertaking physical activity throughout the week;
- duration of a single physical activity.

Sedentary behaviors:

- number of hours spent on sedentary activities per day using a computer and phone – using the Internet, Chat, sending emails;
- regularity of breaks taken during prolonged sitting.

Tobacco smoking:

- current scale of tobacco smoking.

The study was carried out between March and May of 2021. The respondent group consisted of 332 students of the Tourism and Recreation Faculty at the University WSB Merito of Wrocław, Poland. The survey covered undergraduates in their first and second year, participating in full-time and part-time studies (Table 1). Women made up the vast majority of participants. The sample comprised 259 women and 73 men in the 18-36 age group.

Statistical analysis was used to examine the results produced. For estimating the differences in the prevalence of responses between women and men, a test for two structure indicators was employed. The significance level adopted in the study was $p=0.053$.

Results

Positive dietary behaviors are the absolute prerequisite for people to maintain good health and proper development. Breakfast is responsible for providing the body with morning energy, which is then sustained throughout the entire day. This is why respondents were asked about the prevalence of breakfast consumption per week.

Daily breakfast consumption was considered to be a health-enhancing behavior, whereas having no breakfast at all was deemed to be particularly harmful to health.

A health-enhancing number of meals (daily breakfast consumption) was reported by 53.3% of respondents (Table 1). Statistically significant differences were identified between

genders, and they proved to be unfavorable for women who were more likely to skip daily breakfast. The percentage of men declaring to have breakfast on a daily basis stood at 65.8%, while for women it was only 49.8%. Irregular breakfast consumption (less than once a day) was reported by 23.2% of respondents.

The habit of having no breakfast at all, which falls short of the recommendations and, therefore, causes the greatest concern, was referred to by 23.5% of respondents. Drawing on the data produced by the survey, one could argue that the percentage represents those young people who are at greatest risk of suffering from body weakness, lower cognitive abilities and malaise, as well as being at risk of eating high-calorie snacks throughout the day.

Table 1. Percentage of students reporting dietary behaviors: breakfast consumption per week

Prevalence of breakfast consumption per week			
Responses	Every day	Less than every day	Never
Men (N=73)	65.8%	19.2%	15.1%
Women (N=259)	49.8%	24.3%	25.9%
Total (N=332)	53.3%	23.2%	23.5%

Respondents were also asked about the prevalence of fruit and vegetable consumption, given that the products provide the body with vitamins and minerals, which play a substantial role in maintaining and strengthening one's health. The Food and Nutrition Institute based in Warsaw recommends consuming fruits and vegetables as often and as much as possible (in the proportion of $\frac{3}{4}$ vegetables to $\frac{1}{4}$ fruits) [18].

Eating fruits and vegetables once a day was considered a health-enhancing habit, while consuming them once a week or never was deemed to pose a risk to health.

The data collected showed that the consumption of health-enhancing products was more prevalent for women than men (Table 2). Analyzing the consumption of fruits and vegetables separately revealed statistically significant differences, not only between genders (daily fruit consumption: 45.9% of women, 32.9% of men; daily vegetable consumption: 42.9% of women,

18.1% of men), but also between the kinds of foods, showing that men enjoyed eating fruits (32.9%) much more than vegetables (18.1%).

However, in terms of their consumption of fruits and vegetables, respondents tended to choose the less-than-every-day category. A group which caused some concern was that in which respondents consumed these two products only once a week or never. Here, the behavior adversely affecting one's ability to maintain and strengthen his or her health was found among 6.7% of respondents whose fruit consumption was sporadic and 6.9% of respondents who only rarely consumed vegetables.

Table 2. Percentage of students reporting dietary behaviors: fruit and vegetable consumption

Health-enhancing food consumption: fruits and vegetables				
Responses	Once a day or more often than once a day	Less than every day	Not more often than once a week	Never
Fruits				
Men (N=73)	32.9%	54.8%	9.6%	2.7%
Women (N=257)	45.9%	49.0%	4.3%	0.8%
Total (N=330)	43.0%	50.3%	5.5%	1.2%
Vegetables				
Men (N=73)	18.1%	64.4%	15.1%	2.7%
Women (N=259)	42.9%	53.3%	3.1%	0.8%
Total (N=332)	37.3%	55.7%	5.7%	1.2%

To gain more insight into the respondents' dietary behaviors, students were also asked about the prevalence of consumption of products posing health risks such as sweets, fast foods, Coca-Cola, and soft and fizzy drinks.

It was assumed that consuming those products once a week at the most or, even better, never, was acceptable. Consuming them more frequently than once a week (two to seven days a week, every day or more often than once a week) was considered to be a health risk behavior.

The survey showed that students reached readily for health risk products, with the following products being consumed more often than once a week: sweets (42.5%), fast foods (53.8%) and soft drinks (15.7%). Gender differences in terms of consumption of Coca-Cola and other soft drinks proved to be too small to be considered statistically significant (Table 3).

Ultimately, the differences in the prevalence of responses between men and women proved to be statistically significant only for the consumption of fast foods and sweets. Men were more likely to eat fast foods (68.7%) while women ate sweets (46.7%).

Although 9.3% of respondents reported never drinking soft drinks, with 1.2% reporting never eating fast foods, the percentage was too small to refer to the incidence as a behavior that is conducive to health.

Within the entire sample there was not one person who had never consumed sweets. The consumption of high calorie products provided respondents with a sense of satiety, which may be related, among other things, to their skipping a nutritious breakfast.

Table 3. Percentage of students reporting dietary behaviors – consumption of sweets, fast-foods and soft drinks per week

Consumption of some non-healthy products: sweets, fast foods, soft drinks			
Responses	More than once a week	Up to once a week	Never
Sweets			
Men (N=73)	27.4%	72.6%	-
Women (N=259)	46.7%	53.3%	-
Total (N=332)	42.5%	57.5%	-
Fast-foods			
Men (N=73)	68.7%	30.1%	1.2%
Women (N=257)	49.0%	49.8%	1.2%
Total (N=330)	53.8%	45.0%	1.2%
Coca-Cola or other soft drinks			
Men (N=73)	19.2%	74.0%	6.8%
Women (N=259)	14.7%	75.3%	10.0%
Total (N=332)	15.7%	75.0%	9.3%

The analysis exploring the frequency with which physical activity was taken up was recognized as extremely important. Drawing on the data collected, it was possible to show that 13.6% of the tourism and recreation students engaged in physical activity in their free time every day during the week. In this respect, the findings revealed statistically significant differences in the prevalence of responses between men and women. Men were more likely to report performing physical activity (seven times a week) (20.5%) than women (11.6%). The highest percentage (51.5%) of the students surveyed reported doing physical activity between five and six times a week (Table 4). Some 3.3% of respondents proved to be at risk of suffering from the effects of doing too little physical activity, considering that their physical activity frequency was at a very low level (less than once a week).

Table 4. Percentage of students reporting weekly frequency of physical activity

Physical activity frequency during the week					
Responses	Less than once a week	1-2 times a week	3-4 times a week	5-6 times a week	7 times a week
Men (N=73)	2.7%	5.5%	9.6%	61.6%	20.5%
Women (N=259)	3.5%	10.0%	26.3%	48.6%	11.6%
Total (N=332)	3.3%	9.0%	22.6%	51.5%	13.6%

The duration of a single physical activity performed by respondents was typically 45-60 minutes (41.9%) (Table 5). Statistically significant differences were found in favor of male participants whose single physical exercise lasted 45-60 minutes (52.1%) and 60-120 minutes (32.9%). Women, on the other hand, were more likely to report a physical activity of less than 60 minutes. It was very unlikely for all the respondents to exercise for less than 30 minutes.

Table 5. Percentage of students reporting the average duration of a single physical activity

Duration of a single physical activity					
Responses	<30 min.	30-45 min.	45-60 min.	60-120 min.	>120 min
Men (N=73)	2.7%	4.1%	52.1%	32.9%	8.2%

Women (N=259)	1.5%	39.0%	39.0%	10.8%	9.7%
Total (N=332)	1.8%	31.3%	41.9%	15.7%	9.3%

The study also investigated the activities performed by the tourism and recreation students most frequently during their free time and those which involved prolonged sitting. The most popular activity proved to be using the Internet on the computer or smartphone, watching films, eating, reading books, listening to music, playing computer games and handicrafts. The author decided to examine the most popular activity involving the use of the computer and smartphone, as a form of free time activity competing with daily physical activity.

Respondents were asked how many hours a day they spent on browsing the Internet using a computer or a mobile phone. Considering that behaviors which expend very little energy cause numerous health problems, the American Academy of Pediatrics recognized that reducing the time spent seated in front of a “glass screen” to the maximum of two hours was critical for human health [19].

Hence, spending free time without moving in front of the computer or mobile phone screen for more than two hours a day was considered to be a health risk behavior. The categories were defined as two to three hours a day, and four or more hours a day. Moreover, a health-enhancing behavior was defined as one that included no computer or phone use during free time (for checking Chat, the Internet, sending emails) and spending time on the activity of no more than one to two hours a day.

The length of free time spent in front of a computer and phone considered to be harmful to health was reported by 94.8% of respondents (more than two hours spent seated) (Table 6). Some 85.8% of the surveyed respondents admitted sitting motionless in front of a screen for more than two to three hours a day, with 9% reporting spending more than four hours a day in front of a computer or phone screen.

The results found statistically significant gender differences. Women were much more likely (89.6%) to spend more than two hours of their free time on chatting, using the Internet and emailing than men (72.6%).

Only 5.5% of men and 2.7% of women reported reducing their free time spent passively in front of the computer and phone to up to, at most, two hours a day. Respondents who reported not using a computer or phone, apart from having to use it as part of their occupational, family and social duties, accounted for only 1.8%.

Table 6. Percentage of students reporting sedentary behavior

Number of hours spent on activities which use a computer or mobile phone (Chat, the Internet, sending emails) during free time				
Responses	I don't use it	Less than 2 hours a day	2-3 hours a day	4 and more hours a day
Men (N=73)	2.7%	5.5%	72.6%	19.2%
Women (N=259)	1.5%	2.7%	89.6%	6.2%
Total (N=332)	1.8%	3.3%	85.8%	9.0%

The participants were also asked how regularly they took breaks while sitting for a long time during their free time as well as while learning and working. Breaks were considered to be regular if they lasted five minutes and involved changing position every hour, or half an hour, which was even better.

A substantial percentage of respondents (25.8%) admitted to being aware of the fact that prolonged sitting could lead to serious health problems, but they tended to forget regular breaks (20% of students sometimes forgot; 5.8% often forgot). An equally concerning percentage was that of students (16.1%) who immersed themselves in work and learning with “no breaks” at all, believing that in the way they would have more free time later. The belief was more prevalent among women than men; however, the differences proved to be too small to be statistically significant (Table 7). Furthermore, 17% of students did not think about taking

regular breaks, with as many as 26.4% admitting to taking no breaks at all. Only 14.9% of respondents reported taking regular breaks (a five-minute break every hour – 9.7%, and every half an hour – 5.2%). No statistically significant differences were found at the point between male and female respondents.

Table 7. Percentage of students reporting regular breaks during prolonged sitting during their free time, while studying and working

Regular breaks during prolonged sitting			
Responses	Men (N=71)	Women (N=259)	Total (N=330)
5 min-break per hour	12.7%	8.9%	9.7%
5 min-break per 30 min.	4.2%	5.4%	5.2%
I sometimes forget to take a break	23.9%	18.9%	20.0%
I often forget to take a break	8.5%	5.0%	5.8%
I'd rather work taking no breaks so I can have time for other things later on	9.9%	17.8%	16.1%
I haven't thought about that	19.7%	16.2%	17.0%
I don't take regular breaks	21.1%	27.8%	26.4%

Further analysis focused on the tobacco smoking behavior considered to be extremely harmful to health. There is no number of cigarettes that could be regarded as safe; epidemiological studies argue that smoking just two cigarettes increases platelet adhesion 100 times. Heavy tobacco smokers are 30 times more likely to develop lung cancer and 20 times more likely to suffer from other forms of cancer. It is unfortunate that many people do not think about the risks associated with smoking cigarettes. As teenagers, many had already been through different stages of behaviors involving tobacco smoking, starting with a preparatory stage to experimenting, to regular smoking, to ultimately becoming addicted to nicotine for many years.

Students were asked whether they currently smoked tobacco. Those surveyed who smoked tobacco (every day and less often) were considered to display a health-risk behavior. Moreover, no smoking was considered to be a health-enhancing behavior.

Despite the fact that a substantial percentage (86.1%) of the respondents reported not smoking, the remaining 13.9% are at risk of developing cardiovascular diseases, cancer and respiratory diseases (Table 8).

In relation to the sample population, men were more likely to admit smoking tobacco (12.3%) than women (4%). The differences in the prevalence of tobacco smoking between men and women proved to be statistically significant. A group that was particularly at risk of developing tobacco-related diseases was that with respondents reporting smoking tobacco every day. It accounted for 5.3% of the sample population.

Table 8. Percentage of students reporting risk health behaviors in terms of tobacco smoking

Current tobacco smoking			
Responses	I don't smoke at all	Every day	Less than every day
Men (N=73)	63.0%	12.3%	24.7%
Women (N=250)	92.8%	3.2%	4.0%
Total (N=323)	86.1%	5.3%	8.7%

Discussion

There are close interactions between regular consumption of foods, the nutrients they contain and human health. Nearly 40 diseases and health disorders are caused by poor nutrition [20]. The amount of daily energy intake through eating and drinking should equal the energy expended through physical activity and bodily functions [21]. Energy taken from foods and beverages repairs damaged tissues, supports growth, maintains healthy brain functions, regulates body temperature and maintains the body's basic functions such as cardiac functions.

Moreover, it is conducive to mental well-being, fostering concentration and memory, as well as supporting physical efforts undertaken on a daily basis [22-27].

The first things to be emphasized are regular consumption of meals (four to five meals per day every three to four hours) and eating fruits and vegetables as often as possible and as much as possible (a ratio of $\frac{3}{4}$ of vegetables to $\frac{1}{4}$ of fruits). Vegetables and fruits provide the body with precious minerals, vitamins and polyphenols, which all reduce morbidity and mortality caused by cardiovascular diseases, diabetes and cancer [18,28].

Some 80% of the Polish population believe that they have a healthy or very healthy diet. A majority of people with higher education report having a healthy diet (88%). As compared to previous years, adults now eat fruits and vegetables more frequently. The percentage of those who consume the products on a daily basis has been growing, while the percentage of those who report having them “a few times a week” has been dropping considerably [29].

The current healthy food pyramid is a response to the WHO recommendations representing, among other things, the idea of reducing sugar intake [18,28]. Although the consumption of soft drinks among adults has been dropping, many are aware that they still eat too many sweets [29].

The research published by Eurostat shows that men are more likely to display a behavior that does not follow the balanced diet guidelines, whereas women, who pay more attention to their appearance, appreciate the importance of healthy diet for maintaining a good figure [30].

The data produced by the survey confirmed a health-enhancing habit, which is eating breakfast every day (53.3%). Fruits and vegetables were equally popular in the respondents' daily diet (fruits – 43%; vegetables – 37.3%). However, it is still essential to educate the public with a view to ingraining proper dietary habits, considering that the respondents' dominant choice was consumption of fruits and vegetables in the less-than-every day category. Similar to the findings produced by the Public Opinion Research Centre (CBOS), the students of the

Tourism and Recreation Faculty in Wrocław were also aware of the consequences brought about by high sugar consumption; over half of the respondents had tried to reduce their consumption of sweets (57.5%) and soft drinks (75%) to once a week. However, it was women who were more likely to eat sweets than men.

Respondents who reported eating fast food at least once a week (53.8%) are especially at risk of health problems caused by poor diet. The type of food is likely to attract young people because of its general accessibility, low price and the speed with which it is prepared and eaten.

Proper dietary behaviors are a necessary prerequisite for staying healthy, with physical activity, however, being an equally important ally in the respect. The American College of Cardiology and the American Heart Association highlight that what underpins human health and its improvement is physical activity of the amount specified as necessary [31].

Research confirms insufficient levels of physical activity to maintain health and failure to meet recommendations for intensity and volume of physical activity [32-35].

Regular physical activity helps to maintain appropriate body weight, to lower cholesterol, stabilize lipid metabolism, maintain correct blood pressure, strengthen bone structure, and reduce the risk of developing the following diseases: high blood pressure, cancer, ischemic heart disease, heart attack and diabetes [35-37].

The World Health Organization recommends that healthy adults should engage in aerobic physical activity of moderate intensity for at least 150 minutes throughout the week, or vigorous aerobic physical activity for at least 75 minutes throughout the week, or an equivalent combination of moderate and vigorous aerobic physical activity aimed at reducing the risk of developing cardiovascular diseases [38].

The necessary amount of physical activity should be cumulative, in at least ten-minute bouts. Also, it is better if the activity combines exercises of moderate and vigorous intensity [28,35,38,39]. For additional health benefits, adults are recommended to increase their

moderate aerobic physical activity to 300 minutes throughout the week, or their vigorous aerobic physical activity to 150 minutes throughout the week, or an equivalent combination, that is, combining moderate and vigorous aerobic physical activities [38].

A single dose of physical activity should have a duration of 20-60 minutes. The amount that tends to be recommended is 30 minutes. People who are unable to perform physical activity continuously for 30 minutes are recommended to undertake physical activity several times throughout the day in eight-to-ten-minute bouts of similar intensity. It is also important to spend two days per week on activities which strengthen muscles and increase their endurance (involving major muscle groups) [3,36-38].

Higher percentage of men concentrate on ensuring their well-being and spending their free time effectively [30,40,41]. The percentage of men who do physical activity or other sports at least 150 minutes per week is significantly higher (36%) than that of women (26%). Yet, despite the fact that men report engaging in physical activity more frequently, they are more likely to be overweight (in the EU, 57% of men; 44% of women) [30].

According to the data of the CBOS, meanwhile, six out of ten people in Poland report performing physical activity. Drawing on the analysis of socio-demographic variables, the age factor correlated most strongly with physical activity and referred largely to 18 to 34 year-olds, especially to those who live in larger towns or cities, are well-educated and content with their financial situation. In 2017/2018 students and pupils were most likely to report physical activity (97%) [42].

The MultiSport Index studies (2019) reported increased engagement in physical activity among Poles (64%), as compared to 2018. Among the physically active, respondents with higher education (78%), high earnings (83%) and learners (90%) and those in the age group 15-24 (80%) [43] stood out positively, a finding that is similar to that of the CBOS.

However, one needs to stress that the survey indicator included physical activity performed at least once a month. Only 19% of respondents took up physical activity five times a week. It is worth pointing out that one in three people living in Poland perform no physical activity at all, which implies that Poland is one of the least physically active societies in the European Union, ranking sixth from the bottom. Moreover, the leaders, Finland, Denmark, the Netherlands and Sweden, report their average result at 94% [28,43].

The latest report (2021) prepared by the Public Health Committee of the Polish Academy of Sciences has been particularly relevant . it highlights that the measures aimed at reducing the differences in terms of physical activity between Poland and the most physically active societies will make an effective contribution to higher life expectancy of the country's citizens. It is these very population-focused interventions, designed primarily to increase physical activity, coupled with interventions relating to the other risk factors attributable to cardiovascular diseases and cancer that can make the difference in terms of the longevity gap reduction between Poland and Western Europe and Scandinavia (PHC PAS) [28].

The study found that over half of the tourism and recreation students engaged in physical activity (51.5% perform physical activity five to six times a week; 13.6% every day). It represents a high percentage considering that only 19% of respondents performed physical activity five times a week according to the MultiSport Index survey. The average duration of a single physical activity was 45-60 minutes (41.9%) with 30-45-minute bouts being not that much less popular (31.3%) [43].

The expectation is that the actions pursued during the university years aimed at promoting health (within the areas which are inextricably linked to health such as physical development, physical fitness and activity) will foster students' proactive approach to physical activity development in their free time and physical and mental improvement [44].

In-depth studies carried out by the CBOS have revealed Poles' views on the most effective action contributing to improving public health. Doing physical exercises regularly was recognized by respondents as paramount (48%). The fact that a similar percentage of respondents (47%) chose a healthy diet is also of interest. The weight of the survey has shown that behaviors involving physical activity and nutrition should be equally significant in maintaining health. One in four respondents (23%) recognized free time activity (e.g. going for a walk, cycling) as playing a major role in improving the population's health, with nearly one-fifth reporting not smoking as a way of improving public health (20%) [29].

On the one hand, people are engaged in organized physical activity, yet, on the other hand, we are seeing an increase in sedentary behaviors. These represent a group of activities where the body expends only a small amount of energy and which are usually done while sitting [39,45-47]. An ever-greater number of developed countries are facing a pandemic of "physical laziness". Popular models of free time activities include sitting in front of a TV, computer or smartphone, with technological conveniences and means of transport further contributing to the phenomenon of this reduction in physical activity [3,48-50]. Numerous studies have raised the alarm over the fact that 40% to 60% of the EU population lead a sedentary lifestyle [51]. An average European sits down for over six hours a day. The WHO report, meanwhile, finds that a sedentary lifestyle is one of the critical risk factors of the ischemic heart disease, being responsible for 22% of cases [50]. An average Pole spent four hours and 16 minutes per day watching traditional TV [52]. Moreover, the Polish Internet Research in 2020 showed that 14.6 million women and 14.1 million men used the Internet. An average Internet user spent almost two hours and ten minutes per day on the net. Using mobile tools to connect with the Internet was reported by 42% of respondents. The percentage of people using stationary computers and laptops stood at 18%. It implies that the world of the Internet has moved into our pockets, thus, turning into a temptation which is close at hand [53].

Prolonged sitting can cancel the benefits arising from regular physical activity performed in free time, eventually leading to obesity and also being attributable to cardiovascular problems as well as bone, joint or muscle problems. To reduce the negative impact of prolonged sitting, scientists recommend maintaining a correct body posture and taking regular breaks [3,11,32-36].

The effects of sedentary behaviors in relation to dietary behaviors suggest that while watching TV, young people (29% of men and 28% of women) tend to eat crisps and drink Coca-Cola, with a similar percentage (27% of men and 26% of women) eating sweets and drinking fizzy drinks [54,55].

Furthermore, the current study of health behaviors among the academic youth of Wrocław found that prolonged sitting was popular among the students to a level that raises concern. Health risk involving the amount of time remaining seated (for over two hours a day) was reported by 94.8% of those surveyed.

Sedentary behaviors reduce physical activity to the necessary minimum, ultimately leading to obesity and faulty posture. Trying to reduce sedentary behaviors is extremely difficult, especially at a time when our civilization is imbued with technology news attracting young people's attention. Still, it is advisable to fight against sedentariness in order to maintain public health.

Tourism and recreation graduates should act as guides for people on how to develop a physically active lifestyle. They should adopt the role of organizers of attractive forms of physical activity, in particular when we consider that there are increasingly more duties and tasks which are performed while sitting. The Wrocław students were asked whether they took regular breaks during prolonged sitting in their free time as well as while studying or working. The survey showed that only a small percentage of respondents (less than 15%) took regular five-minute breaks every hour, or even better every half an hour.

The world's most widespread health risk behaviors include tobacco smoking. It is recognized as a major factor increasing the risk of developing numerous diseases which are considered to be the most common causes of death in the world [56-58]. The Polish Ministry of Health reports that tobacco smoke contains 4,000 chemicals, including over 40 known carcinogens and many toxic agents which endanger human health and can lead to premature death [59]. The American Cancer Society confirms the harmful effects of tobacco use, demonstrating that a tobacco smoker inhales tar, as well as radioactive polonium, phenol, hydrocyanic acid, ammonia, arsenic, acetone, nickel, formaldehyde and carbon monoxide. The toxic ingredients present in cigarettes can cause cardiovascular diseases, respiratory system diseases, cancer, as well as gum and periodontium diseases [60,61].

The World Health Organization warns that there is no such thing as a harmless number of cigarettes which one can smoke [62]. Tobacco smoking is attributable to about 400,000 deaths annually, accounting for 19% of all deaths [63,64]. Moreover, heavy smokers are not the only victims of tobacco smoking – second-hand smoking is equally harmful to health and can lead to the same premature death as a smoker [65]. Despite the risk involved in tobacco smoking, epidemiological data shows that every day 100,000 young people become addicted to nicotine across the world [66].

A study conducted by the Chief Sanitary Inspectorate on “Poles’ attitudes towards tobacco smoking” shows that one in five Poles (21%) still report heavy (daily) tobacco smoking [67].

There are gender differences in terms of tobacco smoking prevalence – men are more likely to use tobacco products (24%) than women (18%). Another observation is that the percentage of male smokers increases proportionately with age. The highest percentage of smokers, who are at the same time at greatest risk of developing tobacco-related diseases, is made up of men aged 40 (34%), women aged 30 (26%), with vocational education (32%) and

who perceive their financial situation as poor (25% overall). People with higher education are least likely to report tobacco smoking (18% of men, 11% of women).

Although the trend, in terms of the number of regular tobacco smokers, has been in decline over the past few years, most smokers continue to smoke in the presence of non-smokers, especially at home (34%) [67].

Furthermore, it was noticeable that the percentage of adults who were able to give up smoking cigarettes comprised 8% of men and 7% of women. Still, the study carried out by Eurobarometer on behalf of the European Commission has, sadly, suggested that 57% of respondents in Europe who decided to give up or reduce traditional tobacco smoking have turned to e-cigarettes [68].

The analysis of the author's survey showed that a majority of the academic youth (86.1%) had not taken up health-risking tobacco smoking. Having said that, consideration should be given to how many of the 14% of smokers (5.3% were everyday smokers, 8.7% less than every day) tend to smoke in the presence of other students, thus, not only endangering their own health, but also that of their peers.

The research on the "Life of Women and Men in Europe" published by Eurostat shows significant gender differences. Men are characterized by a lower overall indicator of healthy behaviors, as compared to women. Men are more likely to drink alcohol, smoke tobacco (24% of men aged 18 and over smoke tobacco every day, while women account for 16%) and men are less likely to consume fruits and vegetables (49% of men and 54% of women consume one to four portions of fruits or vegetables daily) [30].

The study confirmed the statistically significant differences in the prevalence of responses between men and women. The study found that men displayed behaviors that were conducive to health in terms of daily physical activity of longer duration. They were less likely to spend their free time sitting in front of a computer or phone; they had breakfast on a daily

basis; and they were less likely to consume sweets. Furthermore, the survey showed that in terms of healthy food consumption men preferred fruits to vegetables. As already confirmed in other studies, men were more likely to report tobacco smoking than women. Not only were women less likely to smoke tobacco, but they were also more likely to display proper dietary habits, eating fruits and vegetables more frequently. In addition, they were less likely to consume fast foods.

The findings produced and their analysis allowed the following conclusions to be reached:

1. Health-enhancing number of meals – daily breakfast consumption – was reported by 53.3% of students. The study [69] found that 14.5% of male and 14.6% of female university students skipped breakfast, while 23.6% of men and 24.7% of women ate breakfast irregularly. 73% of students skip breakfast and only 5% of women and 6% of men eat breakfast daily [70].
2. Participants largely chose fruit and vegetable consumption in the “less-than-daily” category. Students had an average daily fruit and vegetable intake of 3.11 ± 2.64 portions [71]. Only 5.1% of students met the recommended vegetable intake, while 46.2% met the fruit intake [72].
3. Participants consumed health-risk products more frequently than once a week: fast-food (53.8%), sweets (42.5%), and soft drinks (15.7%). Students have high levels of consumption of ultra-processed foods, especially confectionery, biscuits and chocolates, which are considered junk food [73].
4. The tourism and recreation students in the study tended to engage in physical activity five to six times a week (52.5%). The study showed that 84.6% of tourism and recreation students were physically active, with 52.8% moderately active and 31.8% highly active [74].

5. The duration of a single physical activity performed by all participants tend to be 45-60 minutes (41.9%).
6. The length of free time spent in front of a computer and phone considered to be harmful to health – sitting for longer than two hours daily – was reported at a disconcerting level of 94.8% of students. Students [75], especially those aged 17-20, frequently use digital technology in their leisure time, with 91.8% using smartphones and 80.3% using laptops.
7. A small percentage of respondents (14.9%) took regular breaks during prolonged sitting (five minutes every hour). Other students forgot to take breaks (25.8%); postponed breaks (16.1%) to have more free time later on; did not think about taking a break (17%) or ignored it (26.4%).
8. A vast majority of students reported not smoking tobacco; however 14% of them were at risk of developing tobacco smoking-related diseases such as cardiovascular diseases, cancer, and respiratory system diseases.

Conclusions

The findings produced and their analysis allowed the following conclusions to be reached. The results show statistically significant differences in the prevalence of responses between men and women:

1. Men are more likely to perform physical activity seven days a week; they favor a longer single physical activity; they are less likely to spend their free time motionless in front of a computer and phone (using the Internet, Chat, sending emails); they consume breakfast daily and they are less likely to eat sweets.

2. Women are less likely to report tobacco smoking; they are more likely to consume healthy foods such as fruits and vegetables; they are less likely to consume fast foods.
3. No statistically significant gender differences were found in terms of taking regular breaks and drinking Coca-Cola and other soft drinks.

The data from the current study showed that respondents displayed diverse health behaviors. It would be advisable to step up efforts to raise students' awareness in terms of positive health behaviors. One hopes that the initiatives designed to promote healthy behaviors adopted during university years will help the tourism and recreation graduates to develop an active approach towards achieving the overriding objective which is showing concern for the health of their loved ones and their own health.

Limitations

There is no doubt that some limitations of the study and the potential areas for expanding the research should be identified. First of all, it is advisable to involve many more respondents in further studies. Further research should focus on detailing differences that will allow direct individualized preventive action in students' health behavior.

Disclosures and acknowledgements

The authors declare no conflicts of interest with respect to the research, authorship, and/or publication of this article.

This research was supported by statutory activities of WSB-DSW Merito Scientific Federation.

Artificial intelligence (AI) was not used in the creation of the manuscript.

References:

1. www.hbsc.org [Internet]. Health Behaviour in School-aged Children (HBSC) [access 2021 Jan 10]. Available from: www.hbsc.org.
2. Gryban G, Harlinska A, Solodovnyk O, Tkachenko P, Skoruy O, Pantus O, et al. The formation of the healthy lifestyle behaviors of higher education institution students by means of physical culture and health-improving activities. *Sci J Natl Pedagog Dragomanov Univ Ser 15 Sci Pedagog Probl Phys Cult Phys Cult Sport.* 2022; 6(151): 42-46. [https://doi.org/10.31392/NPU-nc.series15.2022.6\(151\).08](https://doi.org/10.31392/NPU-nc.series15.2022.6(151).08)
3. Ziembra M, Groffik D, Frömel K, Vorlíček M. Surveillance of physical activity and sedentary behavior in Polish children and adolescents: a scoping review of literature from 2000 to 2022. *Health Prob Civil.* 2024; 18(2): 215-244. <https://doi.org/10.5114/hpc.2023.133886>
4. Conner M, Norman P. Health behaviour: sexually transmitted infection prevention behaviour, sun protection behaviour, medication non-adherence, and health professional behaviour. *Psychol Health.* 2023; 38(6): 667-674. <https://doi.org/10.1080/08870446.2023.2167076>
5. Nowicki GJ, Ślusarska B, Zbonna B, Kocka K, Bartoszek A, Wiśniewska A. [The scope of understanding the concept of “health behavior” and the determinants of human health activities]. *Acta Sci Acad Ostroviensis Sectio A.* 2018; 11(1): 372-387 (in Polish). https://doi.org/10.33674/acta_1720181
6. Humeniuk E, Dąbska O, Pawlikowska-Łagód K, Rumińska M. [Assessment of selected health activities undertaken by teenagers in east-central Poland]. *Rozprawy Społeczne.* 2018; 12(2): 73-81 (in Polish). <https://doi.org/10.29316/rs.2018.14>

7. Radosz Z, Tomaszewska-Kumela P, Papłaczyk M, Gruszczyńska M. Medical students health behaviors. *Rozprawy Społeczne*. 2020; 14(2): 151-164. <https://doi.org/10.29316/rs/122023>
8. Aragón-Martín R, Gómez-Sánchez MD, Martínez-Nieto JM, Novalbos-Ruiz JP, Segundo-Iglesias C, Santi-Cano MJ, et al. Independent and combined association of lifestyle behaviours and physical fitness with body weight status in schoolchildren. *Nutrients*. 2022; 14(6): 1208. <https://doi.org/10.3390/nu14061208>
9. Pachu N, Webber S, Strachan S. Effects of self-affirmation on university students' processing of health risk messages related to sedentary behavior. *J Am Coll Health*. 2024; 72(1): 293-301. <https://doi.org/10.1080/07448481.2022.2034831>
10. Seow AN, Choong YO, Choong CK, Moorthy K. Health tourism: behavioural intention and protection motivation theory. *Tourism Rev.* 2022; 77(2): 376-393. <https://doi.org/10.1108/TR-11-2020-0546>
11. Materová E, Pelcová J, Gába A, Frömel K. Surveillance of physical activity and sedentary behaviour in Czech children and adolescents: A scoping review of the literature from the past two decades. *BMC Public Health*. 2022; 22(1): 363. <https://doi.org/10.1186/s12889-022-12766-0>
12. Woynarowska B. [Education and health]. Warszawa: Wydawnictwo Naukowe PWN; 2021 (in Polish).
13. Mielke GI, Menezes AMB, Da Silva BGC, Ekelund U, Crochemore-Silva I, Wehrmeister FC, et al. Associations between device-measured physical activity and cardiometabolic health in the transition to early adulthood. *Med Sci Sports Exerc*. 2021; 53(10): 2076-2085. <https://doi.org/10.1249/MSS.0000000000002696>

14. Grajek M, Krupa-Kotara K, Białek-Dratwa A, Staśkiewicz W, Rozmiarek M, Misterska E, et al. Prevalence of emotional eating in groups of students with varied diets and physical activity in Poland. *Nutrients*. 2022; 14(16): 3289. <https://doi.org/10.3390/nu14163289>
15. Olajide D, Eberth B, Ludbrook A. Analysis of multiple health risky behaviours and associated disease outcomes using Scottish linked hospitalisation data. *Front Public Health*. 2022; 10: 847938. <https://doi.org/10.3389/fpubh.2022.847938>
16. Sohail A, Akritidis J, McGuinness S, Leder K. Perceptions of travel-related health risks and pre-travel health-seeking behaviour among students: a qualitative analysis. *Travel Med Infect Dis*. 2023; 52: 102532. <https://doi.org/10.1016/j.tmaid.2022.102532>
17. Griffin K, Twynstra J, Gilliland JA, Seabrook JA. Correlates of self-harm in university students: a cross-sectional study. *J Am Coll Health*. 2023; 71(3): 959-966. <https://doi.org/10.1080/07448481.2021.1909049>
18. www.pzh.gov.pl [Internet]. Warszawa: Instytut Żywości i Żywienia w Warszawie [access 2024 Sep 8]. Available from: <https://www.pzh.gov.pl/serwisy-tematyczne/instytut-zywnosci-i-zywienia/> (in Polish).
19. American Academy of Pediatrics Committee on Public Education: Children, adolescents and television. *Pediatrics*, 2001, 107, 423-426.
20. Woynarowska B. [Health education]. Warszawa: Wydawnictwo Naukowe PWN; 2012 (in Polish).
21. Ravelli MN, Schoeller DA. An objective measure of energy intake using the principle of energy balance. *Int J Obes*. 2021; 45(4): 725-732. <https://doi.org/10.1038/s41366-021-00738-0>

22. Guiné RPF, Florença SG, Aparício MG, Cardoso AP, Ferreira M. Food knowledge for better nutrition and health: a study among university students in Portugal. *Healthcare*. 2023; 11(11): 1597. <https://doi.org/10.3390/healthcare11111597>

23. AlBlooshi S, Khalid A, Hijazi R. The barriers to sustainable nutrition for sustainable health among Zayed University students in the UAE. *Nutrients*. 2022; 14(19): 4175. <https://doi.org/10.3390/nu14194175>

24. López-Moreno M, Garcés-Rimón M, Miguel-Castro M, Fernández-Martínez E, Iglesias López MT. Effect of nutrition education on health science university students to improve cardiometabolic profile and inflammatory status. *Nutrients*. 2023; 15(21): 4685. <https://doi.org/10.3390/nu15214685>

25. Trottier CF, Lieffers JRL, Johnson ST, Mota JF, Gill RK, Prado CM. The impact of a web-based mindfulness, nutrition, and physical activity platform on the health status of first-year university students: protocol for a randomized controlled trial. *JMIR Res Protoc*. 2021; 10(3): e24534. <https://doi.org/10.2196/24534>

26. Kusuma MP, Al-bashabsheh Z, Albashabsheh N, Parker M, Muturi N. Examining weight stigmatization toward obese individuals among nutrition and dietetic students using the attribution theory. *Indian J Public Health*. 2023; 67(3): 415. https://doi.org/10.4103/ijph.ijph_1615_22

27. Su S, Lipsky MS, Licari FW, Hung M. Comparing oral health behaviours of men and women in the United States. *J Dent*. 2022; 122: 104157. <https://doi.org/10.1016/j.jdent.2022.104157>

28. Narodowy Instytut Zdrowia Publicznego PZH – Państwowy Instytut Badawczy. [The report Insufficient levels of physical activity in Poland as a threat and challenge to public health]. Warszawa: Narodowy Instytut Zdrowia Publicznego PZH – Państwowy Instytut Badawczy; 2021 (in Polish).

29. Bożewicz M. [CBOS Report – research message: How healthy do Poles eat?. No. 106/2019]. Warszawa: CBOS; 2019 (in Polish).

30. EUROSTAT. The life of women and men in Europe — a statistical portrait — 2018 edition. Luxembourg: EUROSTAT; 2018.

31. Arnett DK, Blumenthal RS, Albert MA, Buroker AB, Goldberger ZD, Hahn EJ, et al. 2019 ACC/AHA guideline on the primary prevention of cardiovascular disease: executive summary. *J Am Coll Cardiol.* 2019; 74(10): 1376-1414. <https://doi.org/10.1016/j.jacc.2019.03.009>

32. Groffik D, Fromel K, Ziembra M, Mitas J. Trends in physical activity in adolescents participating and not participating in organized team or individual physical activity. *Ann Agric Environ Med.* 2023; 30(3): 536-542. <https://doi.org/10.26444/aaem/162040>

33. Groffik D, Frömel K, Ziembra M, Mitáš J, Seniow-Chmiel S. Organized physical activity of secondary school students and university sports science students. *Ann Agric Environ Med.* 2022. <https://doi.org/10.26444/aaem/150011>

34. Groffik D, Frömel K, Ziembra M, Mitáš J. The Association between Participation in organized physical activity and the structure of weekly physical activity in Polish adolescents. *Int J Environ Res Public Health.* 2021; 18(4): 1408. <https://doi.org/10.3390/ijerph18041408>

35. Niklasson J, Backåberg S, Lindberg T, Bergman P, Fagerström C. Embodied navigation: the influence of lived experience on physical activity and sedentary behavior among older adults. *Int J Qual Stud Health Well-being.* 2024; 19(1): 2313657. <https://doi.org/10.1080/17482631.2024.2313657>

36. Vejux J, Le Bruchec S, Bernat V, Beauvais G, Beauvais N, Berrut G. Fragility and quality of life, the benefits of physical activity for the elderly. *Geriatr Psychol Neuropsychiatr Vieil.* 2021; 19(2): 127-136. <https://doi.org/10.1684/pnv.2021.0924>

37. García-Estela A, Angarita-Osorio N, Holzhausen MC, Mora-Salgueiro J, Pérez V, Duarte E, et al. Evaluating the effect of exercise-based interventions on functioning in people with transdiagnostic depressive symptoms: a systematic review of randomised controlled trials. *J Affect Disord*. 2024; 351: 231-242. <https://doi.org/10.1016/j.jad.2024.01.191>

38. World Health Organization. Global recommendations on physical activity for health. Geneva: WHO; 2010.

39. World Health Organization. WHO guidelines on physical activity and sedentary behaviour. Geneva: WHO; 2020.

40. Appelqvist-Schmidlechner K, Heikkinen R, Vasankari T, Virtanen T, Pihlainen K, Honkanen T, et al. Relationships between psychosocial well-being and leisure time physical activity among 160,000 young Finnish men: a cross-sectional study during 2015–2021. *Arch Public Health*. 2023; 81(1): 26. <https://doi.org/10.1186/s13690-023-01040-3>

41. Tomczyk S, Altweck L, Schmidt S. How is the way we spend our time related to psychological wellbeing? A cross-sectional analysis of time-use patterns in the general population and their associations with wellbeing and life satisfaction. *BMC Public Health*. 2021; 21(1): 1858. <https://doi.org/10.1186/s12889-021-11712-w>

42. Omyła-Rudzka M. [Physical activity of Poles. No. 125]. Warszawa: CBOS; 2018 (in Polish).

43. MultiSport Index 2019. [Survey of physical activity of Poles]. Warszawa: Benefitsystems.pl; 2019 (in Polish).

44. Tafireyi CGS, Grace JM. The physical activity and health promotion activities of global university students: a review of reviews. *Glob Health Promot*. 2022; 29(4): 63-73. <https://doi.org/10.1177/17579759221099308>

45. Kowalczyk M, Resiak M. [Sedentary behavior of students and their parents]. *Rocznik Naukowy AWFiS Gdańsk*. 2014; 24: 11-18 (in Polish).
46. Prusik K, Cieślicka M, Mandzáková M, Limanowska K, Żukow W. [Effects of sexual dimorphism on physical development and motor skills of 13-year-olds]. *J Health Sci*. 2013; 3(10): 471-490 (in Polish).
47. Woźniak K, Resiak M. [Physical activity, sedentary behavior, and overweight and obesity in adults: a review paper]. *Rocznik Naukowy AWFiS Gdańsk*. 2016; 26: 5 (in Polish).
48. Niźnikowska E, Bergier J, Bergier B, Ács P, Junger J, Salonna F. Factors influencing level of physical activity among female students from the Visegrad countries. *Health Prob Civil*. 2019; 13(1): 19-29. <https://doi.org/10.5114/hpc.2018.80225>
49. Kantanista A, Tarnas J, Borowiec J, Elegańczyk-Kot H, Lubowiecki-Vikuk A, Marciniak M, et al. Physical activity of children and adolescents from the Czech Republic, Hungary, Poland, and Slovakia: a systematic review. *Ann Agric Environ Med*. 2021; 28(3): 385-390. <https://doi.org/10.26444/aaem/125557>
50. World Health Organization. *The World Health Report 2002: reducing risks, promoting healthy life*. Geneva: WHO; 2002.
51. European Union. *EU Physical Activity Guidelines. Fourth consolidated draft*. Brussels: EU; 2008.
52. Reisner B. [Information on TV audiences in Poland in 2019]. Warsaw: AGB Nielsen Media Research; 2020 (in Polish).
53. PBI. [Polish Internet Research]. Warsaw: PBI; 2020 (in Polish).
54. Jodkowska M, Oblacińska A, Tabak I. [Patterns of physical activity and sedentary behaviors among 13-year-olds in Poland]. *Pediatr Pol*. 2013; 88: 508-513 (in Polish). <https://doi.org/10.1016/j.pepo.2013.08.008>

55. Napierała M, Szark-Eckardt M, Żukowska H, Kuska M, Zukow W. [Physical activity in the healthy lifestyle of Bydgoszcz middle school students]. Rocznik Naukowy AWFiS Gdańsk. 2014; 4(11): 11-32 (in Polish).
56. World Health Organization. WHO Report on the Global Tobacco Epidemic 2009: The MPOWER package. Geneva: WHO; 2009.
57. Gratale SK, Chen-Sankey J, Ganz O, Teotia A, Strasser AA, Schroth K, et al. Does noticing cigar warnings associate with cigar harm perceptions and smoking behaviors? Analysis from Wave 5 of the Population Assessment of Tobacco and Health Study. *Addict Behav.* 2024; 152: 107958. <https://doi.org/10.1016/j.addbeh.2024.107958>
58. Abufarsakh B, Okoli CTC, Darville AK, Williams LB, Garcia AR, Martin C. Tobacco use behavior among adults exposed to cumulative adverse childhood experiences: A systematic review and meta-analysis. *Addict Behav.* 2024; 152: 107948. <https://doi.org/10.1016/j.addbeh.2023.107948>
59. International Agency for Research on Cancer. Tobacco smoke and involuntary smoking. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans Volume 83. Lyon: WHO; 2004.
60. American Cancer Society. Cancer facts & figures 2003. Georgia: ACS; 2003.
61. American Cancer Society. Cancer facts & figures 2014. Georgia: ACS; 2014.
62. World Health Organization. WHO Report on the Global Tobacco Epidemic 2009: The MPOWER package. Geneva: WHO; 2009.
63. Zadworna-Cieślak M, Ogińska-Bulik N. [Adolescent health behavior]. Warszawa: Wydawnictwo DIFIN; 2011 (in Polish).
64. Sanderson C. Health psychology. New York: Wiley; 2004.

65. Lim CCW, Rutherford B, Gartner C, McClure-Thomas C, Foo S, Su FY, et al. A systematic review of second-hand smoking mass media campaigns (2002-2022). *BMC Public Health*. 2024; 24(1): 693. <https://doi.org/10.1186/s12889-024-18222-5>

66. Cornacchione Ross J, Kowitt SD, Rubenstein D, Jarman KL, Goldstein AO, Thrasher JF, et al. Prevalence and correlates of flavored novel oral nicotine product use among a national sample of youth. *Addict Behav*. 2024; 152: 107982. <https://doi.org/10.1016/j.addbeh.2024.107982>

67. Główny Inspektorat Sanitarny. [Poles' Attitudes Toward Smoking – report 2019]. Warszawa: Portal Gov.pl (in Polish).

68. Eurobarometer. Attitudes of Europeans towards tobacco and electronic cigarettes. Brussels: European Commission; 2020.

69. Brito LS, Pitaluga LP, Fonseca LB, Rodrigues PRM, Muraro AP, Ferreira MG. Frequency of breakfast consumption is associated with anthropometric markers of body adiposity in university students. *Rev Nutr*. 2024; 37: e240052. <https://doi.org/10.1590/1678-9865202437e240052>

70. Çetik S, Yıldız S. [Determining the of breakfast having habits among university students and suggestions of solution]. *J Inst Sci Technol*. 2020; 10(3): 655249 (in Turkish). <https://doi.org/10.21597/jist.655249>

71. Çapar AG, Çelik N, Beşparmak A, Aykut M. Fruit and vegetable consumption of university students, affecting factors and barriers. *Esk Turk Dun Uyg Arast Halk Sag Derg*. 2024; 1: 1390144. <https://doi.org/10.35232/estudamhsd.1390144>

72. Dharmayani PNA, Williams M, Lopes CVA, Ronto R, Chau JY, Partridge SR, et al. Exploring reasons for high levels of food insecurity and low fruit and vegetable consumption among university students post-COVID-19. *Appetite*. 2024; 107534. <https://doi.org/10.1016/j.appet.2024.107534>

73. Garrido-Arismendis JJ, Huamán-Romaní YL, Calla-Chumpisaca Y, Leon-Ramirez A, Bellido-Ascarza Y. Perspective on the consumption of ultra-processed foods among university students. *Int J Innov Res Sci Stud.* 2024; 7(2): 2892. <https://doi.org/10.53894/jjirss.v7i2.2892>

74. Maqbool F, Arif M, Kashif M, Asghar R. Physical activity levels and suggestions for its promotion among university students. *RJHS.* 2021; 3(1): 92. <https://doi.org/10.52442/rjhs.v3i1.92>

75. Gil García ED, Alemán Ramos PF, Martín Quintana JC. [Digital technology and university leisure: exploring students' access, use, and attitude]. 2023; 22(2): 83 (in Spanish). <https://doi.org/10.17398/1695-288X.22.2.83>