

PART I. DISEASES AND PROBLEMS DISTINGUISHED BY WHO AND FAO
DZIAŁ I. CHOROBY I PROBLEMY WYRÓŻNIONE PRZEZ WHO I FAO

HEALTHY BEHAVIOR OF PHYSICAL EDUCATION UNIVERSITY STUDENTS

ZACHOWANIA ZDROWOTNE STUDENTÓW WYCHOWANIA FIZYCZNEGO

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Authors' contribution

Wkład autorów:

A. Study design/planning
zaplanowanie badań

B. Data collection/entry
zebranie danych

C. Data analysis/statistics
dane – analiza i statystyki

D. Data interpretation
interpretacja danych

E. Preparation of manuscript
przygotowanie artykułu

F. Literature analysis/search
wyszukiwanie i analiza literatury

G. Funds collection
zebranie funduszy

Summary

The purpose of this study is to examine the healthy behaviors in undergraduate students of physical education (PE) with a comparison between gender and majors. A content analysis of Polish and foreign authors' publications was performed by searching the following database: EBSCO, Proquest, Science Direct (Elsevier), Springer, Sage, and Wiley. Research indicates that undergraduates demonstrate, in general, low levels of healthy lifestyle behaviors, especially regarding diet, psychoactive substance use, coping with stress, physical activity and preventive behavior. PE students present with a high level of health-risk behavior. On the other hand, some research showed that PE students scored better than their peers of other areas of study in selected dimensions of health-related behavior. The majority of studies indicate that female students scored significantly better than male students in health-related behavior. Health promotion programs should be implemented at campuses and universities for the maintenance and improvement of a healthy lifestyle among students of all areas of study.

Keywords: health-related behavior, health risk behavior, gender, physical education, undergraduates

Streszczenie

Celem tej pracy jest analiza zachowań zdrowotnych studentów wychowania fizycznego (WF), w porównaniu płci i kierunków studiów. Przeprowadzono analizę treści publikacji autorów polskich i zagranicznych, przeszukując następujące bazy danych: EBSCO, Proquest, Science Direct (Elsevier), Springer, Sage i Wiley. Wyniki badań wskazują, że studenci prezentują ogólnie niski poziom zdrowego stylu życia, w odniesieniu do diety, zażywania substancji psychoaktywnych, radzenia sobie ze stresem, aktywności fizycznej i zachowań profilaktycznych. Studenci WF przedstawiają raczej wysoki poziom zachowań ryzykownych dla zdrowia. Z drugiej strony, niektóre badania wykazały, że studenci wychowania fizycznego uzyskali wyższe wyniki niż ich koledzy z innych wydziałów w niektórych wymiarach zachowań zdrowotnych. Większość badań wskazuje, że studentki uzyskują znacznie wyższe wyniki w zachowaniach zdrowotnych niż studenci. Programy promocji zdrowia powinny być wdrażane na kampusach i uniwersytetach w celu utrzymania i poprawy zdrowego stylu życia wśród studentów wszystkich kierunków studiów.

Słowa kluczowe: zachowania prozdrowotne, zachowania ryzykowne dla zdrowia, płeć, wychowanie fizyczne, studenci studiów licencjackich

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Introduction

Health-related behaviors may be defined as any “personal attributes such as beliefs, expectations, motives, values, perceptions, and other cognitive elements; personality characteristics, including affective and emotional states and traits; and overt behavior patterns, actions and habits that relate to health maintenance, to health restoration and health improvement” [1]. Positive health behaviors may include such categories as preventive behaviors (e.g., avoiding psychoactive substances), avoidance of risk-taking behaviors (e.g., related to behavioral addiction), and behaviors that improve health by maintaining and enhancing wellbeing (e.g., visiting the doctor regularly) [2]. Satisfaction with life and high quality of life are related to a healthy lifestyle, which manifests in

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such practices as a healthy diet, appropriate level of physical activity, preventive behaviors, coping with stress, positive social relationships and adjustments, and avoidance of psychoactive substances (e.g., nicotine, alcohol, drugs). On the other hand, poor mental and physical health and higher rates of mortality are associated with unhealthy lifestyles and sedentary behavior [3], which results in higher health care costs. An unhealthy lifestyle contributes to emerging major chronic diseases, such as coronary heart disease, stroke, diabetes, and cancer [4]. Importantly, healthy behaviors during childhood may influence adolescent health behaviors and be related to other essential health outcomes [5], while inadequate levels of physical activity (PA), sedentary behavior, and unhealthy nutrition are related to obesity [6,7], which may lead to decreased functional mobility and lower levels of quality of life in older age [8,9].

Early adulthood is the best time period for achieving the long-term advantages of a healthy lifestyle [10]. A key role in the development of a healthy lifestyle is health education. It seems particularly relevant to shape health behaviors in students of physical education (PE), as these students will become our future health educators and promoters. Unfortunately, research indicates that the health-related behavior (measured by using the Health Behavior Inventory (HBI)) of Polish PE teachers does not differ from the average Polish population [11]. Moreover, Kubińska and Pańczuk [12] showed that many PE teachers demonstrate health-risk behaviors, such as drinking alcohol and substance use. Given that PE teachers serve as role models for primary and secondary students, the unhealthy lifestyles they exhibit is of concern. These health-risk behaviors may be a result of insufficient knowledge and/or reduced motivation to conduct a healthier lifestyle. Accordingly, the systematic examination of attitudes toward health among future PE teachers is necessary.

Aim of the work

The present research focuses on the analysis of various dimensions of a healthy lifestyle among university students. Healthy behavioral factors examined include: consumption of a healthy diet, avoiding psychoactive substance use, coping with stress, engaging in physical activity (PA) and preventive behavior. A comparison of healthy behavior between students of different areas of study was a secondary aim of the study. In particular, the healthy and unhealthy behaviors of PE students was compared with other non-PE students. Finally, the role of gender on health behaviors was also examined.

Material and methods

For the study, the following databases were searched: EBSCO, Proquest, Science Direct (Elsevier), Springer, Sage, and Wiley. In addition, the Google search engine was used to find scientific publications in an Open Access option, which was particularly useful for articles in the Polish language. Keywords included: "health-related behavior", "health-risk behavior", together with "gender", "Physical Education students", "college students", and "undergraduates". The main inclusion criteria for selected articles were peer-reviewed publications from scientific books and journals related to the above mentioned keywords. A total of 175 publications were found in the first stage of screening. Exclusion criteria were as follows: 1) the participants in the publication were not students of a college or university; 2) only one of the set of keywords was related to the publication. A final count of 68 publications met the strict criteria for inclusion in this review.

Healthy and unhealthy behavior among university and college students

The traditional stereotype of a hedonistic student lifestyle freed from family constraints is related to the high prevalence of unhealthy behaviors [13-15]. Studying at college or university is often characterized by high levels of stress and health-risk behaviors [16,17], which include physical inactivity [18,19], smoking [20-22], alcohol and substance use [23-25], and poor nutrition [26]. These behaviors may contribute to adverse health outcomes, decreased subjective wellbeing, and worsened mental and physical health. Health-risk behaviors have been found to be reinforced by social support networks, academic pressure and stress, busy schedules, and habitual behaviors [17]. It is important to note, university students who report more overall psychological distress show fewer positive health behaviors (HB) across all HB dimensions [2].

The unhealthy lifestyle in university and college populations seems to be a universal trend across the world [e.g., 27-29]. Keller et al. [27] found a high prevalence of risk behaviors among German undergraduates. Over 95% of the total sample ($N=1262$) ate less than five servings of fruits and vegetables, 60% did not exercise sufficiently, 31% were current smokers, and 62% reported binge drinking. Research performed among American university students indicates that unhealthy eating, smoking, and lack of exercise are the most commonly reported negative

behaviors [17]. Whatnall et al. [26] found in a large sample of Australian university students ($N=3077$), that 90% of them did not meet the vegetable recommendations, 50% exceeded lifetime risk guidelines for alcohol intake, 38% were insufficiently physically active, 40% were overweight or obese, 38% demonstrated a high or very high risk of psychological distress, and 22% were food insecure. Among university students from New Zealand, around 42% reported binge drinking, 15% did not meet PA guidelines, 28% were overweight or obese, 20% smoked, and 76% did not meet dietary guidelines [28]. The results of a study conducted at King Saud University (Saudi Arabia) also indicate that students are leading unhealthy lives [15]. The majority of students presented unhealthy eating habits and inadequate PA levels, and 20% were overweight (11% were obese). The majority of college students from Kuwait University reported moderately healthy lifestyles in such categories as diet, exercise, and sleep [14]. Around half of the students ate a healthy diet (50%) and got at least seven to nine hours of sleep (46%), but only one-third of the sample performed exercise frequently (34%). Over one-third of the group was obese (39%), and many had iron deficiency anemia (IDA; 49%). It is important to note that IDA is not a common health issue in this culture, but is rather unique to college students, as a result of poor diet.

As evidenced by these worldwide findings, the most commonly reported negative behaviors are insufficient levels of PA, sleep issues, poor nutrition, and too few meals per day [30-31]. University students are prone to sedentary behavior, which is associated with multiple adverse health outcomes, such as obesity, cancer, type 2 diabetes, cardiovascular disease, and total mortality. Sedentary behavior is also related to numerous problems in social behavior and academic achievement [19]. A recent review showed that the prevalence of sedentary behavior among university students ranges from 34% to 90% [18]. The most prominent factors associated with sedentary behavior were overweight and depressive symptoms. On the other hand, physically active students report more excellent health (both overall and mental) and higher happiness scores than their inactive peers [30]. Unfortunately, among a large representative sample of university students in Ireland [30], only 64% met the WHO recommended level of 150 minutes of moderate to vigorous PA per week.

Obesity continues to be an epidemic in college students [32]. Research indicates that overweight and obesity ranges between 30% to 40% in the university student population [e.g., 14, 15]. Osborn et al. [33] have examined relationships among perceived body weight, actual body weight, body satisfaction, and selected health behaviors in a sample of undergraduate students at a southern Louisiana university. Body Mass Index (BMI) was significantly related to several health behaviors, including drinking diet soda, eating at the student union, and stress eating. Research indicates that college students have a good knowledge of a healthy diet, but, despite this, their nutritional choices are usually not healthy [13,34].

Association between particular dimensions of healthy and unhealthy behavior

Research indicates that various categories of health-related behavior are interrelated [e.g., 35, 36]. Dinger and Vesely [37] examined the relationship between PA and other health-related behaviors (e.g., cigarette smoking, binge drinking, illegal drug use, fruit and vegetable consumption, risky behaviors, and body mass index) among a representative sample of U.S. college students. Cigarette smoking, inconsistent seat belt use, and inadequate consumption of fruits and vegetables were significantly associated with low levels of PA among college students after controlling for age, sex, and race. Dinger and Vesely [37] found the strongest association between PA and fruit and vegetable consumption. Research indicates that low levels of regular physical exercise were associated with significantly lower scores in physical functioning, bodily pain, and vitality. Regular smoking was related to significantly lower scores in physical functioning and general health [16,38]. Litwic-Kamińska and Izdebski [39] found a positive association between the level of PA and other health behaviors, such as proper nutrition, preventive behavior, and positivemental attitude.

Studies have shown that students who reported engaging in multiple health-risk behaviors were also more likely to report poorer mental health [20,22]. Canadian undergraduates with the highest likelihood of engaging in multiple health-risk behaviors (e.g., marijuana and other illicit drug use, risky sex, smoking, binge drinking, poor diet, physical inactivity, and insufficient sleep) reported poorer mental health, particularly as it relates to stress health-risk behaviors [22]. In particular, those who reported a higher score of marijuana use were more likely to use a variety of substances and engage in hazardous drinking than non-users [24,40]. All scales of the HBI, such as healthy habit nutrition (HHN), preventive behavior (PB), positive adjustments (PA), and healthy practices (HP) were positively correlated with each other with moderate or high strength [41,42]. Excessive alcohol drinking was also negatively correlated with health-related behavior (in particular, with healthy eating and preventive behavior) among a sample of Polish undergraduate students [42].

Differences in health behavior among university students according to area of study

Research indicates that health-related and health-risk behavior might differ between university students in different areas of study. For instance, law students experience higher levels of psychological distress than members of the general population, as well as compared to university students in other professional disciplines [43]. However, most research examining this question was performed among students in health-related majors [e.g., 44-46]. Consistently, studies have found that knowledge about healthy lifestyles, as well as greater awareness of self-responsibility for health, are not strong predictors of commitment to healthy behavior [e.g., 47, 48]. For example, research indicates that a large portion of nursing students displayed unhealthy dietary habits and poor health status [31,49,50]. Al-Qahtani [49] also examined healthy lifestyle behaviors of female university students enrolled in health-related studies, compared to women not in health-related studies. Both groups exhibited low levels of health-promoting behaviors, with highest scores in spiritual growth and lowest in physical health. However, the non-health profession female students had significantly higher engagement in PA than the health profession students, who showed better health responsibility, spiritual growth, and interpersonal relation practices. Evans et al. [50] explored the health and health-related behaviors of undergraduate nursing students in Scotland. The students' health behavior profiles were similar to that of the general population in Scotland. Overall, 23% of the undergraduate nursing students rated their physical health as excellent or very good, with 48% rating their mental health as such. Around 76% of students met WHO recommendations for PA per week (minimum 150 min.), which is substantially higher than previously reported pa levels in the general college population. Almost one-third of the participants were overweight (29%), and one-fifth were obese (18%). The majority of nursing students (86%) consumed alcohol, and 15% reported episodes of binge drinking. The prevalence of current smoking was 25%.

A study examining the behaviors of pharmacy students, on the other hand, showed that most did not exercise regularly; the majority of the pharmacy students also reported drinking alcohol excessively [16]. Binge drinking was similarly highly prevalent in a sample of German medical students, and this behavior was, again, related to other health-risk behaviors, such as smoking, using cannabis, not exercising, and not eating fruits and vegetables. Medical students showed slightly more positive patterns of a healthy lifestyle than students of law and education [27]. Bíró et al. [44] found that over half of Hungarian students in public health studies were smokers, with more than one-quarter smoking daily. Almost one-fifth of these students suffered from psychological distress, with higher rates among female public health students than age-matched women in the general population. Kozieł et al. [46] found that the majority of medical and health sciences students in Poland exhibited low levels of healthy practices and healthy habits in nutrition. Unhealthy dietary and health habits such as nighttime snacking, coffee drinking, low milk drinking, and lack of exercise were also found among Korean female nursing students [31].

Comparison of undergraduates of PE and other areas of study

Research indicates that physical education students, who will teach health education to children in the future, demonstrated rather unhealthy lifestyles and a high risk of alcohol and drug use [e.g., 51-53]. Szczerbiński et al. [34] examined dietary behaviors (e.g., intake, frequency, consumption of various food groups, and eating between meals) among undergraduates in PE compared to tourism. Students in both groups demonstrated a generally healthy diet. Among health-risk behaviors in PE students, the most common were such dimensions as inadequate participation in leisure-time PA, sleep deprivation, smoking, excessive and regular alcohol drinking, and illegal drug use [e.g., 54, 55]. As many students in these majors are often student-athletes, it is important to note that Graupensperger et al. [52] suggest that peer acceptance and cohesiveness are associated with attitudes toward risky behavior among college student-athletes.

A number of other investigations have found differences in health-related behaviors between students in PE and other areas of study. Kubińska and Bergier [56] compared health-related behavior among university students in PE and public health (PH). The results of this study indicate that healthy eating and systematic physical activities are the most important behaviors and health practices practiced by PE students. Whereas, among PH students, balanced nutrition (81%) and PA (81%) were the most preferred health behaviors. PE students engaged in sport participation to a great extent (76%); they also engaged in health eating (73%) and did not use or had limited use of stimulants (e.g., caffeine, alcohol, nicotine, psychoactive substances; 36%). Palacz [57] also examined differences between university students in four different areas of study: pedagogy, physiotherapy, PE, and tourism and recreation. Physiotherapy students had the highest levels of positive health behaviors; whereas, students in tourism and recreation had the lowest. Another study [39] showed that those PE undergraduates who are engaged in collegiate sport, demonstrate the highest levels of healthy behavior, in comparison to PE non-athletes, pedagogy, and information technology (IT) students. Further, Rogowska et al.

[42] showed that students of PE drank more alcohol, but scored higher in preventive behaviors than the students in other majors.

Yermakova's cross-cultural study showed that PE students from Poland and Ukraine might differ in health and health culture [58]. Polish PE students believe that an essential reason for engaging in PA is improving one's physical condition, strengthening self-esteem, and improving overall health. In comparison, the main motives of PA participation among Polish students from other areas of study are improving physical well-being and mental health. The Ukrainian PE students, on the other hand, report different motivations for engaging in PA; the majority of Ukrainian PE students believe that participation in various sports clubs is an important part of building a healthy culture and that organizing physical culture, sports, and educational work with students cannot be limited to PE classes. Ukrainian students in other areas of study report engaging in PA to improve health, enhance knowledge in specific subjects (e.g., humanities), and to promote healthy lifestyles.

Gender differences in health behavior among university students

It is well-established that women engage in more positive health behaviors than men [e.g., 59-61]. For instance, research conducted among a French national sample of medical students indicates that women smoke tobacco and cannabis less frequently than men, and they have lower rates of alcohol use disorders [60]. Bastardo [16] also found gender differences in health behaviors (i.e., smoking, alcohol consumption, and regular PA) and perceived health status in pharmacy students. Specifically, male students were more likely to consume alcohol and to exercise regularly than female students. There was no difference in smoking behavior between male and female students. Male students also demonstrated significantly higher scores in bodily pain, general health, vitality, and social functioning than female students [16]. Numerous studies have revealed that men are more likely than women to exercise regularly, but also to smoke, use substances, and drink alcohol excessively [e.g., 59-61]. Women usually demonstrate higher levels of overall healthy behavior (exceptionally healthy nutrition), but also higher stress and depression rates [e.g., 62-64]. On the other hand, high levels of poor health behavior were found recently in young adult men from the U.S. [65]. Almost 40% of men exhibited unhealthy behaviors (e.g., poor diet, no exercise, substance use), compared to only 22% of women. Interestingly, college education was found as a more protective factor for men.

Denton et al. [59] examined gender-based inequalities in health. They argue that women's poorer health is related to their reduced access to material and social factors that foster health, as well as differential exposure to stressful life events and the everyday stresses associated with women's social roles (e.g., mother, wife, worker). On the other hand, men's health may be reduced by their higher likelihood of engaging in health-risk behaviors, such as smoking and excessive drinking. Further, some research indicates that women score lower on physical performance tests and score higher in depression compared to men. For example, results of a study by Karadag and Yildirim [66] suggest that 40% of university students were depressed, and many report not having enough information about maintaining a healthy lifestyle and coping with stress. Depressive symptoms were specifically associated with the female gender, high level of life stress and eating disorders, and lower levels of body image satisfaction and self-esteem among Korean university students [64]. However, these consistent gender patterns in health inequities may be related to women over-reporting and men under-reporting health problems, as suggested by Oksuzyan et al. [67].

Rogowska et al. [42] found that Polish female PE students drink significantly less alcohol than male PE students and demonstrate a higher level of overall health behavior (in the total HBI and several HBI subscales, except positive adjustment). Female PE students placed a high importance on healthy eating (90%), engaging in sport activity (54%) [56], and not taking stimulants (49%). However, Baumgart et al. [10] examined health behaviors among young people studying physiotherapy. The responses of these students were similar to the general population, without statistically significant differences between men and women.

Conclusions

University students exhibit a generally unhealthy lifestyle. Unfortunately, unhealthy lifestyle behaviors appear to be common, regardless of area of study, and including among students of PE and other health-related studies (e.g., medicine, nursing, public health). Among the various dimensions of health-related behaviors, students specifically exhibit poor nutrition, physical inactivity, substance use (smoking, excessive alcohol drinking and drug use), sedentary behavior, high stress, and insufficient sleep. The main consequences of an unhealthy lifestyle include higher rates of overweight or obesity, decreased social behavior, lower academic achievements, decreased subjective wellbeing, and poorer mental and physical health (with elevated depression, in particular). Whatnall et al. [68] found a positive association between academic achievement and diet quality in

a sample of Australian university students. Overall, inadequate nutrition can cause significant health problems and negatively affect academic success.

Further, there is an association between the various dimensions of health behavior, with a higher level of health-risk behavior being related to a lower level of positive health-related behavior among students. There is a little difference between students across areas of study, though PE students demonstrate higher risk-related behavior and seem to be better in two dimensions of health-related behavior (i.e., healthy diet and PA), in comparison to students of other majors. However, this pattern may change over time, so more research is needed in the future. Women report having a healthier diet than men; however, men have higher PA and psychological well-being compared to women. In contrast, men exhibit a higher risk of alcohol and substance abuse compared to women. Thus, targeted health behavior interventions based on gender in this population should focus on increasing PA and stress coping mechanisms in women and improving diet and substance use in men. Finally, knowledge about health behavior of PE and healthcare professionals may be insufficient; this knowledge base should be further examined in the future.

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