ATHENA - HEALTH & RESEARCH JOURNAL
2024 • VOLUME I • Nº2

Levels of physical activity promotion among nursing students in Portugal

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ARTICLE INFO

Received 15 October 2024
Accepted 4 November 2024

Keywords:
physical activity
sedentary behavior
nursing students
body mass index
obesity
mental health

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DOI: 10.62741/ahrj.v1i2.18

ABSTRACT

Introduction: This study examines the relevance of physical activity for health, focusing on nursing students facing challenges associated with a sedentary lifestyle and an academic workload. It delves into the influence of various factors, including age, sex, body mass index, and sedentary behavior.
Objectives: This study aims to describe the levels of physical activity and physical literacy of nursing students at a nursing school in Portugal.
Methodology: This study forms part of a more extensive multicenter investigation. A non-probabilistic convenience sample of 84 nursing students from an institution in northern Portugal was used. Data were collected via self-report online questionnaires that assessed physical activity, sedentary behavior, body mass index, and physical literacy and measured motivation, confidence, and the relevance of physical activity. The statistical analysis employed descriptive and correlational techniques to investigate potential associations between variables, including sex and school year.
Results: Most students were female and in their third year of studies. A considerable proportion of the students were observed to engage in sedentary behavior, with 66.3% exhibited a Body Mass Index within the range typically considered "normal weight" (M = 23.33; SD = 3.28), the majority of students (n = 52; 61.6%) reported engaging in moderate-intensity physical activity weekly (metabolic equivalents between 3 and 6). In contrast, their physical literacy skills were relatively high, with room for comprehension improvement.
Conclusion: The results indicate that body mass index and physical literacy are decisive for promoting physical activity among nursing students, and are eminently related to the sex of the students and the curricular year in which they are enrolled. A fact that can be the basis for measures and/or programs to promote physical activity with specific determinants, which can eventually be implemented in very specific situations, given the particularities of each institution.

Please cite this article as: Couto GR, Soares-Faria JJ, Guerra MMGGP, Moreira MT, Santos JMO, Cruz AG. Levels of physical activity promotion among nursing students in Portugal. Athena Health & Research Journal. 2024; 1(2). DOI: 10.62741/ahrj.v1i2.18

INFORMAÇÃO DO ARTIGO

Recebido a 15 de outubro 2024
Aceite a 4 de novembro 2024

Palavras-Chave:
atividade física
comportamento sedentário
estudantes de enfermagem
índice de massa corporal
obesidade

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DOI: 10.62741/ahrj.v1i2.18

RESUMO

Introdução: Este estudo analisa a importância da atividade física para a saúde, especialmente entre estudantes de enfermagem, que enfrentam desafios devido ao sedentarismo e à carga académica, explorando fatores como idade, sexo, índice de massa corporal e comportamento sedentário, destacando o impacto da pandemia na inatividade física dessa população.
Objetivos: Descrever os níveis de atividade física e de literacia física dos estudantes de uma escola de enfermagem em Portugal.
Metodologia: O presente estudo faz parte de uma investigação multicêntrica mais alargada. Utilizou uma amostragem não probabilística de conveniência com 84 estudantes de enfermagem de uma instituição do norte de Portugal. Os dados foram recolhidos através de questionários autor-reportados via *online* que avaliaram a prática de atividade física, comportamento sedentário, índice de massa corporal e literacia física, assim como mediram a motivação, a confiança e a relevância da atividade física. A análise estatística incluiu métodos descritivos e correlacionais, para explorar possíveis associações entre variáveis como sexo e ano letivo.
Resultados: A maioria dos estudantes era do sexo feminino e estava a frequentar o terceiro ano de estudos. Observou-se que uma proporção considerável dos estudantes tinha um comportamento sedentário, com 66,3% a apresentarem um Índice de Massa Corporal dentro do intervalo tipicamente considerado como "peso normal" (M = 23,33; DP = 3,28), a maioria dos estudantes (n = 52; 61,6%) referiu praticar atividade física de intensidade moderada semanalmente (equivalentes metabólicos entre 3 e 6). Em contrapartida, as suas competências de literacia física eram relativamente elevadas, com margem para melhorar a compreensão.
Conclusão: Os resultados indicam que o índice de massa corporal e a literacia física são determinantes para a promoção da atividade física entre os estudantes de enfermagem, estando eminentemente relacionados com o sexo dos estudantes e o ano curricular em que se encontram inscritos. Facto que poderá servir de base a medidas e/ou programas de promoção da atividade física com determinantes específicos, que poderão eventualmente ser implementados em situações muito específicas, dadas as particularidades de cada instituição.

Introduction

The regular practice of physical activity is fundamental for physical and mental health. However, in higher education, especially among nursing students, the promotion of this practice faces specific challenges. These students frequently contend with an arduous academic workload and a predominantly sedentary lifestyle, which elevates the likelihood of developing health complications. It is crucial to identify the factors that influence the promotion of physical activity among these students, both for their well-being and to ensure that they can promote healthy habits in the patients they will care for in the future.[1–4]

Physical inactivity represents a significant public health risk factor, contributing to an increase in chronic diseases such as cardiovascular disease and type 2 diabetes.[5] The World Health Organization (WHO) indicates that over 80% of adolescents globally are insufficiently active, which elevates the probability of their perpetuating sedentary behaviors into adulthood.[6] This scenario is of particular concern among university students, who are subject to a combination of academic pressures, stress and a sedentary lifestyle, which collectively increase their susceptibility to developing health problems.[7] Nursing students encounter supplementary obstacles, including a demanding academic workload and clinical placements that curtail the time available for routine physical activity.[8]

Promoting healthy habits among these students is paramount for their well-being and for the development of fundamental skills in professional practice.[9] As prospective health professionals, they are expected to serve as exemplars in health matters for their patients. Adopting healthful behaviors, such as regular physical activity, can enhance their credibility and efficacy in promoting healthy lifestyles.[8,10] Furthermore, physically active professionals who possess good physical literacy—that is, who possess the requisite knowledge, confidence, and competence to engage in physical activity—are better equipped to comprehend patients' needs and promote interventions that enhance their quality of life.[11]

In recent years, there has been a growing emphasis on promoting physical activity in academic settings, given the significant influence that higher education institutions exert on young adults' physical, mental and social health. Despite the pandemic SARS-CoV-2 having occurred two years ago, has exacerbated some existing challenges, including increased

sedentary behavior and reduced opportunities for face-to-face physical activity.[12] That necessity to increase for the for the development of innovative strategies to maintain physical activity, even in contexts where opportunities for such activity are limited. The restrictions imposed, such as lockdowns and distance learning, have resulted in increased sedentary behavior and reduced opportunities for physical activity. The additional burden placed on nursing students, who already contend with considerable academic demands and internships, has had a detrimental impact on their physical and mental health. The benefits of physical activity, including improved mood, reduced stress and increased emotional resilience, have been well documented.[8,13]

Despite extensive research on promoting physical activity in university settings, there remains a high need for improvement in implementing such initiatives among nursing students in Portugal. Higher education institutions are responsible for fostering healthy lifestyle habits among their student populations, yet there is a striking discrepancy.[14,15] Most studies concentrate on university students without considering the specific characteristics of nursing courses, which often entail a considerable workload and challenging internships.[16–18]

Still, more research is needed to examine the role of physical literacy in this demographic despite its pivotal role in promoting physical activity. Many studies have indicated that the academic environment and personal and financial responsibilities influence physical activity levels.[19–21] Likewise, additional factors such as sedentary behavior, self-perception of health and motivation to exercise are also critical determinants.[22]

Physical literacy, the abilities, self-assurance and comprehension required to participate in physical activity, is significant in encouraging physical activity among young people.[23] The concept of physical literacy has gained increasing prominence in the promotion of physical activity. In addition to the capacity to perform physical activities, physical literacy encompasses confidence, motivation and a more profound comprehension of the advantages of regular physical activity. Recent studies indicate that promoting physical literacy, particularly within the university context, can have a long-lasting influence on students' lifestyle decisions, thereby facilitating the maintenance of physical activity after graduation.[11] In the Portuguese context, recent studies indicate the importance of developing programs that increase students' physical literacy from an early age as a means of combating sedentary behavior and promoting sustainable adherence to physical activity.[24]

The academic environment greatly influences students' levels of physical activity. The pressures associated with educational, personal and financial responsibilities can increase sedentary behavior. University students, in particular, encounter several obstacles that impede regular physical activity, including a lack of time, elevated stress levels and restricted access to sports facilities. This is particularly pertinent for nursing students, who are required to undertake demanding academic programs and lengthy internships, which reduces the time available for physical activity and self-care.[8,25]

Furthermore, there is a growing body of evidence to suggest that prolonged periods of sedentary behavior are associated with an increased risk of developing some health problems, including musculoskeletal pain and an elevated risk of developing cardiovascular disease. Additionally, prolonged periods of sedentary behavior have been linked to adverse effects on psychological well-being.[13] To offset these effects, it is recommended that active breaks and technologies that encourage physical activity, such as tracking applications and online fitness challenges, be employed.[26]

Likewise, an individual's perception of their health and motivation to engage in physical activity are also significant factors. The results of studies indicate that a positive self-perception of health correlates with higher levels of physical activity. This suggests that interventions designed to enhance confidence and body image may prove effective in increasing engagement with physical activities.[27–29] The maintenance of healthy habits in the long term is more effectively achieved through intrinsic motivation, which is based on pleasure and personal satisfaction with exercise, than through extrinsic motivation, which is usually related to short-term goals, such as improving physical appearance.[30]

Therefore, it is imperative to promote physical activity and develop physical literacy in university students, particularly in courses like nursing. This is essential to ensure that future health professionals are equipped to care for themselves and others. By incorporating physical literacy programs and innovative technologies, an integrated approach can foster healthy habits and combat sedentary lifestyles. In line with this, the study aimed to describe the levels of physical activity and physical literacy of nursing students at a nursing school.

Methodology

A cross-sectional observational study was conducted in accordance with the ethical standards set forth by the Ethics Committee of the Health Sciences Research Unit (Opinion Nº 965_09_2023). The study is aligned with the National Program for the Promotion of Physical Activity of the Directorate-General for Health[31] and aims to elucidate the Portuguese context of nursing students with regard to the paradigm of the Promotion of Physical Activity and Physical Exercise in the Portuguese population. Additionally, the study seeks to delineate the levels of physical activity and physical literacy of nursing students at a nursing school.

This research, which forms part of a larger project, employs a non-randomized convenience sample comprising 84 students from the various academic years of the nursing degree

at a higher education institution in the north of Portugal, which aims to describe the levels of physical activity and physical literacy of nursing students at a nursing school.

The students responded to an online survey and, in order to be included in the study, had to be enrolled in the nursing school and participate voluntarily. The online self-completion questionnaire was accessible via a link and QR code on the platform between 15 February and 15 April. Furthermore, the database was validated through a quality control process conducted by an independent researcher. This process allowed for a consistent assessment of exclusion criteria and clarification of any doubtful information.

Data was collected online using a comprehensive self-completion questionnaire, which included the following instruments: (i) A socio-demographic questionnaire was administered to the sample. This included questions on academic year, sex, age, perception of economic level and health status. (ii) A physical activity determinants questionnaire was also completed by the participants. This assessment was carried out using a 4-point Likert scale (example: 1: lowest motivation to 4: highest motivation). This was used to assess the participants' perception of the motivation, confidence, relevance and appropriateness of physical activity training. (iii) Portuguese version of the Perceived Physical Literacy Instrument (PPLI-PT),[32] composed of nine items and three factors (Factor 1: Knowledge and understanding; Factor 2: Self-perception and self-confidence; Factor 3: Self-expression and communication with others), which are measured on a 5-point Likert scale (1: strongly disagree to 5: strongly agree). The 9-item, 3-factor model demonstrated an adequate fit to the data and sufficient construct validity ($\chi 2 = 82.859$, $p < 0.001$, comparative fit index = 0.948, Tucker-Lewis index = 0.922, standardized root mean squared residual = 0.049, root mean squared error of approximation = 0.075), as well as concurrent validity. The score for each factor is calculated as the mean of the three items that comprise it. This enables the identification of the groups within the sample exhibiting the highest values for each factor. (iv) The Portuguese version of the International Physical Activity Questionnaire, Short Form (IPAQ-SF) was employed to evaluate the participants' physical activity and sedentary behavior. The IPAQ-SF comprises nine items designed to quantify the weekly amount of physical activity. This is accomplished by calculating the number of days per week and the mean daily duration of walking and performing moderate to vigorous intensity physical activity. The total weekly energy expenditure is estimated in metabolic equivalents (MET), with consideration given to the time spent in physical activity and its intensity. Furthermore, the IPAQ-SF evaluates the time spent engaged in sedentary activities during the week and on the weekends. Although the questions in the questionnaire were formulated in reference to the previous seven days, they are nonetheless reflective of behaviors and habits acquired over time.[33]

The Global Questionnaire included a pre-test with the pre-final version, which was carried out on 30 individuals with similar characteristics to the sample members. No difficulties in understanding or completing the questionnaire were reported.

The statistical analysis comprised a descriptive and correlational analysis, employing the Spearman, Mann-Whitney and Kruskal-Wallis tests to investigate potential differences and correlations between variables such as sex and school year. All statistical tests were conducted with a 5% significance level. The quantitative variables were summarized using descriptive statistics, comprising absolute (n) and relative (%) frequencies, as well as measures of central tendency, namely means (M), and measures of dispersion, namely standard deviation (SD). In accordance with the IPAQ-SF analysis guidelines.[33] Data were analyzed using non-parametric Mann-Whitney or Kruskal-Wallis tests. The statistical procedures were conducted using the IBM SPSS Statistics software (version 27.0 for Windows). Armonk, NY: IBM Corp. (Statistics Subscription).

All ethical considerations were duly observed. Prior to their involvement in the study, all participants provided informed consent and were assured of their right to withdraw from the study at any time. The study was conducted in accordance with the ethical standards set forth in the Declaration of Helsinki for research involving human subjects. No funding was obtained for this research.

Results

This study's data analysis comprehensively examines physical activity, sedentary behavior, body mass index, and physical literacy among university students. The sample comprised 84 students, with an age range of 18 to 56. The majority of the sample was female and in their third year of a degree in nursing. The principal findings and their scientific significance are presented in the following section.

Demographic Composition

Of the 87 participants, only three declined to take part in the study. The non-random convenience sample comprised 84 students aged between 18 and 56 (M = 21.02; SD = 4.48). All the students were in same degree (n = 83; 100%), with the majority identifying as female (n = 112; 78.3%). Regarding student responses by curricular year, the majority were obtained from students in the third year of the nursing degree (42.2%), followed by the second and first years (30.1% and 25.3%). The response rate from the fourth-year cohort was low, at 2.4%.

Sedentary behavior

The participants were asked to report their sedentary behavior, both during the week (n=34; 39.4%) and at weekends (n=38; 45.2%), and this was categorized into three groups: low (≤ 3h/day), medium (4 to 6 hours/day) and high (≥ 7 hours/day). During the week, 39.4% of students reported low sedentary behavior, 39.29% reported medium sedentary behavior and 21.4% reported high sedentary behavior. A similar pattern was observed at the weekend, with 45.2% of students reporting low sedentary behavior, 32.1% medium sedentary behavior and 22.6% high sedentary behavior.

Body Mass Index

The results of the analysis indicated that the majority of the student population (n = 55; 66.3%) exhibited a Body Mass Index (BMI) within the range typically considered "normal weight" (M = 23.33; SD = 3.28). Nevertheless, 26.5% (n=22) were classified as overweight (BMI between 25 and 29.9), and 2.4% (n=2) were identified as obese (BMI > 30).

Physical activity

Concerning physical activity, measured in multiples of MET, the majority of students (n = 52; 61.6%) reported engaging in moderate-intensity physical activity weekly (MET between 3 and 6). Only 18.6% (M = 12.2; SD = 2.20) of the participants engaged in high-intensity activities (exceeding 6 MET), while 19.8% engaged in low-intensity activities (less than 3 MET).

Physical literacy

The construct of physical literacy was operationalized by measuring three underlying factors. The three factors were as follows: (1) knowledge and understanding, (2) self-perception and self-confidence, and (3) self-expression and communication with others. The factor about knowledge and understanding exhibited the highest levels (M = 1.22; SD = 2.20), whereas the factor of self-perception and self-confidence exhibited the lowest levels (M = 10.85; SD = 2.16).

Difference between the sexes

The data revealed a statistically significant difference between the sexes regarding travel patterns. Most participants were female, yet the male subjects exhibited higher average scores than the female participants (U=164.50; p=0.056), as illustrated in Table 1.

Table 1. Differences in the level of variables determining the practice of physical activity according to sex (Mann-Whitney test)

	Sex			
	Female (*n* = 77) *Medium (DP)*	**Male** (*n* = 6) *Medium (DP)*	***U***	***p***
Method of travel	*3,17 (,834)*	***3,71*** *(,488)*	164,50**	0,056

* $p < 0,05$; ** $p < 0,01$; *** $p < 0,001$

Differences between school years

A notable distinction was observed between school years concerning sedentary behavior, both during the week ($X^{2(2)} = 18.574$; $p < 0.001$) and at weekends ($X^{2(2)} = 15.511$; $p < 0.001$). First-year students exhibited higher sedentary behavior during the week, whereas third-year students demonstrated lower levels. The Mann-Whitney postdoc test revealed a statistically significant difference between the first and third years in the weekly ($U = 209.50$; $p = 0.003$) and weekend ($U = 158.50$; $p < 0.001$) sedentary behavior variables, indicating a reduction in sedentary behavior as students' progress through the course (Table 2).

Table 2. Differences in the variables determining physical activity according to the school year (Kruskal-Wallis test)

Determinants	**School year**				
	1st year (*n* = 21)	**2nd year** (*n* = 25)	**3rd year** (*n* = 35)	***X²(2)***	***p***
Weekly Sedentary Behavior	46,79	**52,64**	29,21	18,574***	0,000
Sedentary behavior on weekends	**54,05**	44,28	30,83	15,511***	0,000

* $p < 0,05$; **$p < 0,01$; *** $p < 0,001$

Significant associations

Spearman's rank demonstration coefficient is a non-parametric statistic that measures the dependence between ranks of two variations, designated by the (p) value. Pearson correlation analyses revealed statistically significant associations between several variables, designated by the r value (Table 3). For instance, age is inversely correlated with both weekly sedentary behavior ($r = -0.224$; $p < 0.05$) and weekend sedentary behavior ($r = -0.273$; $p < 0.01$). With regard to physical literacy, the three factors measured demonstrated positive correlations with the MET of weekly physical activity, indicating that higher levels of physical literacy are associated with greater physical activity. MET are a measure that estimates the energy expenditure of physical activity for a given individual.

Table 3. Spearman's correlation.

Variables	Age	Sedent_W	Sedent_WE	PPLI-F1	PPLI-F2	PPLI-F3	MET_AF_W
Age	1	-,224*	---	---	---	---	---
Sedent_W	-,224*	1	,399**	---	---	---	---
Sedent_WE	-,273**	,399**	1	---	---	---	,268*
PPLI_F1	---	---	---	1	,546**	,427**	,375**
PPLI-F2	---	-,221*	---	,546**	1	,395**	,327**
PPLI-F3	,244**	-,105**	-,238**	,427**	,395**	1	,398**
MET_AF_W	---	---	,268**	,375**	,327**	,398**	1

*Spearman's correlation: * p < 0,05; ** p < 0,01; *** p < 0,001*

Legend: Sedent_W: Weekly Sedentary Behavior; Sedent_WE: Weekend Sedentary Behavior; PPLI_F1: "Knowledge and understanding" domains/factors; PPLI_F2: "Self-expression and communication with others" domains/factors; PPLI_F3: "Weekly sedentary lifestyle" domains/factors; MET_AT_W: Multiples of Weekly Physical Activity MET.

Discussion

Concerning sedentary behavior, it was established that nursing students exhibit elevated levels of sedentary behavior during the first and second years, with a discernible decline observed during the third year. This reduction may be associated with increased practical activities and clinical internships needing greater physical exertion. As previously observed by Pires et al.[34] and Nunes et al.,[14] the findings confirm that students are more focused on theoretical classes and are, therefore, more prone to sedentary behavior in the early stages of the course.

The proportion of time spent on sedentary behavior at the weekend is marginally higher than during the week, except for the second year when the levels remain more balanced. In the first year, adapting to the university rhythm may justify the observed levels of sedentary behavior. In contrast, in the third year, the greater physical demand during the week reduces weekly sedentary behavior, with a possible weekend compensation when students have more time to rest.

These findings reinforce the necessity for implementing strategies designed to promote physical activity, particularly during the initial stages of the course, when sedentary lifestyles are more prevalent. Implementing strategies that promote physical literacy and time management can assist in integrating healthy habits into daily routines, thereby counteracting the adverse effects of sedentary lifestyles during the week and at the weekend.

Regarding the Body Mass Index (BMI), it is notable that more than a quarter of students are classified as overweight (or even obese). As indicated by the Directorate-General for Health, high BMI, encompassing both pre-obesity and obesity, represented the risk factor with the most significant upward trajectory in terms of contribution to the disease burden in Portugal between 2000 and 2021. Over the past two decades (between 2000 and 2021), high BMI was the risk factor that contributed the most to total DALYs (Disability-Adjusted Life Years), with an increase of 28.0% in the number of DALYs attributed to high BMI. Inadequate dietary habits, excess weight and other metabolic risk factors were the primary determinants of the disease burden,[35] which may indicate the necessity for intervention concerning nutritional habits.

Concerning physical activity, the findings indicate that while most students engage in moderate physical activity, a notable proportion are at risk of prolonged sedentary behavior, particularly on weekends. These findings follow the existing literature, which identifies a sedentary lifestyle as an increasing concern among university students.[36]

The correlation between physical literacy and elevated levels of physical activity underscores the necessity for educational initiatives that not only disseminate information regarding the significance of physical activity but also foster students' self-assurance and self-perception of their physical capabilities. It can be reasonably deduced that interventions designed to enhance motivation and confidence in physical activity are a productive strategy for reducing sedentary behavior among nursing students.[23]

The study of physical literacy is a relatively recent phenomenon in Portugal. However, the country has made notable progress in this field due to its active involvement in various European research projects. The advancement of physical literacy at the national and European levels will necessitate the implementation of intervention studies, which will, in turn, facilitate the formation of collaborative partnerships between the education, sports, and health sectors.[37] Physical literacy can be defined as a multidimensional construct, encompassing the integrated development of motivation, confidence, physical competence, knowledge and understanding, which enables individuals to engage in physical activity and move throughout life.[23] In Portugal, research has demonstrated that sociodemographic factors, including sex,

socioeconomic status and educational level, significantly influence physical activity.[38] In the study conducted by Sousa et al. (2022), which included 326 university students, the majority were female (55.8%). Moreover, an investigation into the correlation between sociodemographic factors, specifically sex, and the diverse dimensions of physical literacy revealed minimal to no alteration in the patterns of association between variables for both men and women.[39]

Concerning the distinction between the sexes, most participants were female (n=77). There was a marginally significant discrepancy between men and women regarding their travel habits and physical activity practices. This result may indicate that men adhere to more consistent physical activity routines.

[30,36] This decline can be attributed to the physical demands of clinical activities, which necessitate continuous movement and the utilization of direct patient care techniques. Furthermore, students in more advanced years typically demonstrate a heightened awareness of the significance of healthy habits. This phenomenon has been observed in previous studies, such as that conducted by Wirth et al.,[8,] which highlights that practical experience and the responsibility of caring for others promotes greater self-reflection in future health professionals, encouraging them to adopt a more active and healthier lifestyle. Clinical placements afford students the chance to put into practice the knowledge they have gained about self-care and physical health. Research conducted by Lovell et al.[40] indicates that this experience fosters motivation to maintain an active routine, as nursing students themselves recognize the value of physical activity in the context of their future professional practice. These findings are also consistent with those of Nunes et al[14] who show that students in later years develop greater physical literacy and a better understanding of the relationship between physical activity, mental health and professional performance. Direct clinical practice motivates them to be role models for their patients and reinforces the importance of self-care in their future as nurses. This underlines the importance of clinical placements in developing technical behavioral and self-care skills.

Regarding significant associations, correlation analysis revealed a negative association between student age and sedentary behavior, suggesting that older students, possibly in the later years of the course, tend to be less sedentary. This trend may be explained by greater time management skills acquired during the course, greater physical literacy and experience in clinical placements where physical activity and movement are often required. Previous studies support this phenomenon, showing that health students develop a greater awareness of the importance of physical activity as they progress through their course, influenced by direct contact with health practice and increased professional responsibility.[8,14,40]

According to Ferreira et al.,[15] older students in advanced courses tend to be more aware of the benefits of physical activity and have greater confidence and competence to integrate self-care practices into their routines. The combination of practical experience in clinical placements and the increased physical literacy acquired during their years of training enables them to put their knowledge of health promotion into practice for their patients and themselves. This is in line with the theory of physical literacy, which suggests that competence and confidence are essential for the long-term adoption of healthy lifestyles. In addition, studies such as that by Wirth et al.[8] highlight that practical exposure and direct contact with patients in clinical placements can increase students' motivation to maintain a more active lifestyle as they recognize the impact of physical activity on well-being and quality of life.

These results suggest that as students progress through the course and take on more responsibility, their perception of the importance of physical activity changes, reflected in reduced sedentary behavior. Positive correlations were observed between the multiple of MET and the three physical literacy factors (knowledge and understanding, self-expression and communication, and confidence). This finding suggests that students with higher levels of physical literacy tend to be more physically active, confirming the importance of programs that fully promote physical literacy. Students with greater confidence in their physical abilities are more likely to engage in regular physical activity, which is associated with improved physical and mental well-being. This finding is consistent with the literature, as shown in the study by Cairney et al.,[41] who defined physical literacy as the combination of motor skills, knowledge and confidence that enables individuals to participate in physical activity throughout life. Öztürk et al.[11] also found similar results, showing that physical literacy strongly determines physical activity levels in adolescents and young adults. Both studies highlight that promoting physical literacy makes it possible to improve long-term health behaviors, which is particularly relevant in nursing, where knowledge and application of personal health is vital. These findings highlight the importance of educational interventions in nursing curricula that provide theoretical knowledge about physical activity and increase students' confidence in their physical abilities. Academic programs that integrate these components may significantly reduce sedentary behavior, urgently needed in this population due to the demanding nature of the course and clinical placements. Nunes et al.[14] also identified physical literacy as an essential factor in improving physical activity in nursing students. The study confirms that behavioral, social and contextual change interventions can develop students' confidence and competence to be physically active, which is critical to increasing adherence to healthy behaviors.

Conclusion

This study suggests that factors such as BMI, physical literacy, sex and academic year play an important role in promoting physical activity in nursing students. Implementing educational strategies to increase physical literacy and reduce sedentary behavior may help improve these students' health and well-being. Targeted interventions, such as introducing physical activity into the curriculum and creating awareness campaigns about its benefits, may promote a more active lifestyle among future health professionals. Future studies should examine these variables in different educational contexts and over time to provide a more comprehensive view of health promotion among university students.

This study has limitations regarding sample size, but as this is a sub-sample of a nationwide multicenter study, this limitation may be mitigated when the results are published. In addition, using self-administered online questionnaires may increase the risk of bias in the responses.

Statistical data from this study can be requested from the authors.

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