

RESEARCH ARTICLE (ORIGINAL) 

Motivation for physical activity among nursing students

Motivação para a prática de atividade física em estudantes de enfermagem

Motivación para la práctica de actividad física en estudiantes de enfermería

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Abstract

Background: Long-term involvement and adherence to physical activity are conditioned by motivation.

Objectives: To analyze nursing students' motivation to engage in physical activity and to identify the sociodemographic and academic variables that interfere with the practice of physical activity.

Methodology: This is a descriptive and analytical study involving 372 nursing students. A socio-demographic characterization questionnaire, the Exercise Motivations Inventory (EMI-2), and the International Physical Activity Questionnaire (IPAQ) were administered.

Results: The students' most frequent motives for physical activity were physical fitness, health, and body-related motives. Male students (MR = 227.67) and 2nd and 3rd-year students had the highest physical activity levels. This study also observed that the older the students, the lower the physical activity levels.

Conclusion: The psychological motives are directly related to physical activity, whereas health motives are inversely related to physical activity, which suggests that higher psychological motivation and better levels of health lead to higher levels of physical activity.

Keywords: motivation; exercise; nursing; life style; health promotion

Resumo

Enquadramento: A motivação para a prática de atividade física condiciona a adesão à atividade a realizar e o envolvimento a longo prazo.

Objetivos: Analisar a motivação dos estudantes de enfermagem para a prática de atividade física. Identificar as variáveis sociodemográficas e académicas que interferem na prática de atividade física.

Metodologia: Estudo descritivo, analítico, com 372 estudantes de enfermagem. Aplicou-se um questionário de caracterização sociodemográfica, o Questionário de Motivação para o Exercício e o Questionário Internacional de Avaliação da Atividade Física.

Resultados: Motivos relacionados com a condição física, de saúde e relacionados com o corpo foram os mais indicados pelos estudantes para a prática de atividade física. Os estudantes do sexo masculino (OM = 227,67) e dos 2.º e 3.º anos apresentam maior índice de atividade física. Quanto mais idade, menor a atividade física.

Conclusão: Motivos psicológicos estabelecem relação direta e os motivos de saúde relação inversa com a prática de atividade física, sugerindo que maior motivação psicológica e melhores níveis de saúde conduzem a uma maior prática de atividade física.

Palavras-chave: motivação; atividade física; enfermagem; estilos de vida; promoção da saúde

Resumen

Marco contextual: La motivación para la práctica de la actividad física condiciona la adherencia a la actividad que se va a realizar y la implicación a largo plazo.

Objetivos: Analizar la motivación de los estudiantes de enfermería para realizar actividad física. Identificar las variables sociodemográficas y académicas que interfieren en la práctica de actividad física.

Metodología: Estudio descriptivo y analítico, con 372 estudiantes de enfermería. Se aplicó un cuestionario de caracterización sociodemográfica, el Cuestionario de Motivación para el Ejercicio y el Cuestionario Internacional de Evaluación de la Actividad Física.

Resultados: Los motivos relacionados con la condición física, la salud y el cuerpo fueron los más indicados por los estudiantes para practicar actividad física. Los estudiantes del sexo masculino (OM = 227,67) y los de 2.º y 3.er año presentan mayor índice de actividad física. Cuanto mayor es la edad, menor es su actividad física.

Conclusión: Los motivos psicológicos establecen una relación directa y los motivos de salud una relación inversa con la práctica de actividad física, lo que sugiere que una mayor motivación psicológica y mejores niveles de salud conducen a una mayor práctica de actividad física.

Palabras clave: motivación; actividad física; enfermería; estilos de vida; promoción de la salud

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Introduction

Reduced physical activity is one of the main factors affecting health. Adolescents who spend more time sitting have higher glucose and triglyceride levels and a higher cardiometabolic risk than those who spend less time inactive (Santos et al., 2020). In 2016, 28% of adults worldwide aged 18 years or older were insufficiently active, meaning that they did not meet the recommended 150 minutes of moderate-intensity physical activity or 75 minutes of vigorous-intensity physical activity per week (World Health Organization [WHO], 2020). In Portugal, according to data from the National Food, Nutrition, and Physical Activity Survey of the Portuguese General Population (IAN-AF 2015-2016), the most active populations over 14 years old are in the Azores (33.2%), North region (32.8%) and Madeira (29.1%), and the less active in Alentejo (51.0%), Lisbon (47.5%) and Algarve (46.6%). Considering the level of education, the practice of a physical activity is higher in people with higher levels of education. Approximately 53% of the Portuguese population with higher education regularly does physical activity (Lopes et al., 2017).

Universities are currently implementing interventions to promote changes in younger people's lifestyles for a better quality of life, positively influencing academic performance, and encouraging adherence to practices that promote health and prevent chronic non-communicable diseases (Calazans et al., 2020). Thus, one of the key points to understanding this issue is the analysis of higher education students' motivation to engage in physical activity. Some motivational studies highlight why young people engage in regular physical activity, associating the motivation for physical activity with psychological, physical, and social well-being. Nevertheless, it is essential to highlight the studies aimed at identifying the motives why students regularly engage in physical activity. Nursing students with more self-determined motivation regularly do physical activity, and greater adherence to continuous physical exercise for longer than six months results from a more autonomous behavior (Lemos et al., 2021).

Physical activity is understood as any bodily movement, leading to higher energy expenditure than rest. The contraction of skeletal muscles increases energy expenditure above the resting metabolic rate and is characterized by the modality, frequency, intensity, duration, and context of practice (Caspersen et al., 1985; Thivel et al., 2018). Today, the complexity of the concept of physical activity also involves the culturally specific spaces and contexts in which people move, act, and perform, as well as the interests, emotions, ideas, instructions, and relationships that influence them (Piggin, 2019, 2020).

Thus, the present study aims to explore nursing students' motivation to practice physical activity, considering the benefits resulting from it, and identify the sociodemographic and academic variables that interfere with the practice of physical activity.

Background

Interest or simple curiosity can motivate the practice of physical activity, which is usually associated with leisure time occupation or physical and mental health and well-being, responding to the person's individual and social needs. However, individuals do not experience these needs in a similar way, and motivations result from different factors, such as age, gender, context, timing, and personal, social, economic, and cultural trends, among others (Martins et al., 2018). In a study exploring the motivation for physical activity and related factors in a sample of 499 Japanese university students (407 men and 92 women), Miyawaki et al. (2019) demonstrated that self-efficacy and physical and psychological benefits were inherent factors for physical activity. Students who were more physically active reported benefits from physical activity and were more motivated to exercise for health enhancement, enjoyment, making friends, illness prevention, and competitiveness enhancement.

The WHO considers insufficient physical activity a risk factor for global health and cardiovascular disease, cancer, and diabetes, increasing the risk of death by 20% to 30% compared to sufficiently active people (WHO, 2020). It further identifies that physical activity has significant health benefits and prevents disease. Physical activity, combined with a healthy diet, contributes significantly to the quality of life, prevention of chronic non-communicable diseases, and the promotion of physical, mental, and social health (Calazans et al., 2020). Therefore, physical activity guidelines universally recommend moderate-intensity physical activity.

Nursing students face multiple stress-inducing factors that can lead to risky behaviors and high-stress levels (Tavolacci et al., 2018). These factors result from adapting to curricular programs and academic demands, particularly regarding clinical teachings, patient care, workloads, and negative interactions. The impact of stress on nursing students influences academic performance and may contribute to psychiatric issues such as depression, anxiety, or sleep disorders that can cause low productivity and poor quality of life, as well as suicidal behaviors (Pulido-Criollo et al., 2018). At the same time, nursing students must be aware of the benefits of physical activity to motivate patients to have healthy life habits. In this study, nursing students that did not regularly practice physical activity identified the lack of time, academic obligations, time of year, and economic conditions as obstacles for physical activity (Cilar et al., 2017).

Research questions

How does motivation relate to the practice of physical activity?

What sociodemographic variables impact the practice of physical activity?



Methodology

This is a cross-sectional, correlational, analytical, descriptive quantitative study. A non-probability convenience sample was used, consisting of 372 nursing students of both sexes from the different nursing and health schools of Mainland Portugal. To be a student of an undergraduate or graduate nursing program was the inclusion criterion used to select the sample participants. The exclusion criterion was to be a student from other health areas attending higher education health schools.

Data were collected using an online assessment protocol after the favorable opinion of the Ethics Committee of the School of Health of Viseu (No. 1/2014). All study participants received an informed consent form with the objectives, instructions for completion, and acknowledgment for their collaboration. They were asked to sign the informed consent form before completing the questionnaire. The participants were also informed that their participation was completely free, that they could withdraw from the study at any time, and that they would not receive any benefit or incur any loss by participating. Anonymity and data confidentiality were ensured by assigning a code to the questionnaire and respecting their autonomy. The questionnaire consists of a sociodemographic characterization questionnaire and the following evaluation instruments: the Exercise Motivations Inventory (EMI-2) and the International Physical Activity Questionnaire (IPAQ). The EMI-2 was based on Markland and Ingledew's (1997) version of the Exercise Motivations Inventory (EMI) and translated and validated for the Portuguese population by Alves and Lourenço (2003). It includes five dimensions: psychological motives, interpersonal motives, health motives, body-related motives, and physical fitness motives. The study of psychometric properties revealed a Cronbach's alpha higher than 0.7 in all factors, indicating acceptable reliability. The questionnaire maintained its original structure, keeping the 51 items grouped into 14 motivational factors, distributed by its five sub-models/dimensions. In this research, the psychometric study of the EMI-2 scale determined that Cronbach's alpha coefficients were good, ranging from 0.963 to 0.965 with an overall scale alpha of 0.956. The IPAQ was developed with psychometric characteristics acceptable for use in prevalence studies on physical activity participation by researchers chosen by the WHO. The results of this study, which included data from Portugal, were published by Craig et al. (2003), including three models of analysis: (i) reliability assessment (test-retest) of the same version of the IPAQ administered at two different times that revealed a Spearman's correlation coefficient $p = 0.81$ (for a 95% significance level, CI of 0.79-0.82) for the extended version and $p = 0.76$ (95%, CI 0.73-0.77) for the short version, indicating a good level of reliability, with a good level of repeatability; (ii) criterion validity, in a comparison of self-reported data with those assessed by the accelerometer, over 7 days, resulting in a correlation coefficient of 0.33 (95%, CI of 0.26-0.39) for the extended version and 0.30 (95%, CI of 0.23-0.36) for the short version, indicating moderate agreement

between subjective and objective measures of physical activity assessment; and (iii) concurrent (inter-method) validity, with the comparison of data from the extended and short versions of the IPAQ administered on the same day that indicated that the two versions were analogous, i.e., showed acceptable agreement between them, with a $p = 0.67$ (95%; CI 0.64-0.70). Despite the diversity of samples and countries under study, the results support the acceptability of the psychometric performance of the IPAQ, tested in developed and developing countries, particularly in urban populations. This instrument consists of seven questions concerning the week immediately before the week participants completed the questionnaire, even though they did not consider themselves physically active. The questions focus on activities performed professionally or academically and while commuting, household chores, and activities done in the participants' free time for entertainment or physical exercise/sport. Thus, participants have to consider vigorous-intensity physical activities, which require intense physical effort, resulting in heavy breathing, and moderate-intensity physical activities, which require moderate physical effort, resulting in breathing a little heavier than usual. The participants must only consider physical activities done for at least 10 minutes straight when answering the questions. Considering the sum of the seven items, the overall score for physical activity practice resulted in a minimum score of 7, a maximum of 21, and a mean score of 14.73 ± 3.03 . The variation coefficient (20.57%) indicated moderate dispersion around the mean, and the asymmetry and kurtosis values formed mesokurtic curves skewed to the right.

Descriptive and analytical or inferential statistical methods were used. Data were analyzed using the IBM SPSS Statistics software, version 21.0 (2013) for Windows. Regarding descriptive statistics, absolute and percentage frequencies, measures of central tendency (mean), and measures of dispersion (standard deviation) were used as statistical measures, as well as the measures of symmetry of skewness (SK) and kurtosis (K). Pearson's correlation coefficient was applied to study the quantitative variables and the Chi-square test (χ^2) to study the relationships between nominal variables with two or more categories. The *student t*-test or Mann Whitney *U* test was used to compare two samples, and the one-way ANOVA (analysis of variance) or Kruskal Wallis test to compare three or more samples. Multiple linear regression was used to evaluate the effect of independent variables as predictors of dependent ones.

Results

The results described the sociodemographic profile of the sample of 372 students, revealing a minimum age of 18 years and a maximum of 54 years ($M = 23.33$ years; ± 6.41 years). A part of the female students (43.3%) was in the age group up to 20 years old, while in the group of male students predominated those aged 23 or older (45.1%). Most students were single (female 87.9% vs.

male 80.4%), lived in a small town (female 59.8% vs. male 51.0%), with relatives, of which 51.7% were female and 66.7% were male. Most of the students' fathers completed the 9th grade of basic education (63.6% of the female students' fathers and 66.7% of the male students' fathers), which was similar to the students' mothers (with 55.1% of the female students' mothers and 52.9% of the male students' mothers). Fathers were predominantly active (86.3%), and mothers were mostly active (73.2%). Most female (63.9%) and male (62.7%) students had siblings. Most students did not engage in a paid activity (77.3% female vs. 62.7% male). The highest percentage of students (47.0%) attended the 3rd and 4th years of the undergraduate program, with a slight increase (27.5%) of male students in the 4th year. The same percentage (19.6%) of female students attended the 1st and 2nd years, and only 14.0% were in postgraduate/masters' programs. Regarding the male students' group, 19.6% attended postgraduate/masters' programs, and 11.8% (the lowest percentage) were enrolled in the 1st year. Regarding the Body Mass Index (BMI), 75.1% of the women and 62.7% of the men were eutrophic.

Male students presented a higher mean rank (MR) of the total index of physical activity ($MR = 227.67$), resulting in a statistically significant difference ($p = 0.003$) and suggesting that men practice more physical activity than women.

Students aged 20 or under obtained the highest mean value ($M = 14.81 \pm 2.74$), confirming them as the most active participants, followed by those aged 21-22 ($M = 14.80 \pm 2.94$).

Participants who walked from home to school had the highest mean value ($M = 15.08 \pm 2.81$), meaning that these participants were the most physically active but

without statistical significance.

Regarding the BMI, obese students have a higher mean rank ($MR = 224.91$), suggesting that these are the participants who practice physical activity the most, followed by underweight students ($MR = 208.83$).

Regarding means, 2nd and 3rd-year students demonstrated identical values ($M = 15.24 \pm 2.54$; $M = 15.24 \pm 2.93$, respectively), suggesting they had the highest physical activity level. The variable year in which students were enrolled interfered with the total physical activity index, with an $f = 3.096$ and a p value = 0.016.

The descriptive statistical analysis concerning the motivation for physical exercise revealed minimum values in all subscales of 0.00 and a maximum of 5.0, except for interpersonal motives, whose value was 4.9. The mean indices were between 1.51 ± 1.09 in this same subscale and 3.08 ± 1.17 in the physical fitness-related motives. The asymmetry and kurtosis values tended toward mesokurtic curves, except for the health motives, skewed to the right, while the interpersonal motives were skewed to the left. The Kolmogorov-Smirnov test showed statistical significance ($p = 0.000$).

The students presented mostly physical fitness ($M = 3.08 \pm 1.17$), health ($M = 3.02 \pm 0.93$) and body-related ($M = 2.98 \pm 1.31$) motives to practice physical activity.

The results of the multiple regression of physical activity practice with motivation indicated correlations ranging from weak ($r = 0.037$), for the body-related motives, to reasonable ($r = 0.314$), for the psychological motives, with all correlations being positive but not significant for the health and body-related motives. Thus, as shown in Table 1, greater physical activity was associated with greater motivation to practice it.

Table 1

Pearson's correlation between physical activity practice and motivation

Variables	<i>r</i>	<i>p</i>
Psychological motives	0.314	0.000
Interpersonal motives	0.231	0.000
Health motives	0.054	0.150
Body-related motives	0.037	0.239
Physical fitness-related motives	0.163	0.001

Note. r = Pearson's correlation coefficient; p = Probability of significance.

Psychological and health motives were the predictor variables for the practice of physical activity, explaining 12.0% of the variance in the practice of physical activity, with the adjusted explained variance of 11.5%. The standard error of the regression was 2.856. The F test ($f = 9.029$; $p = 0.003$) and the t value ($t = 25.429$; $p = 0.000$) demonstrated statistical significance, allowing the conclusion that the independent variables that entered the regression model were able to explain the practice

of physical activity. The standardized beta coefficients revealed that the psychological motives were directly related to the practice of physical activity. In contrast, health motives were inversely related, suggesting that the greater the psychological motivation and better health levels, the greater the practice of physical activity. The variance inflation factor (VIF) indicated the absence of collinearity since these values were less than five, as demonstrated in Table 2.

Table 2*Multiple regression between physical activity practice and independent variables*

Dependent variable: Physical activity (global).					
R = 0.346					
R ² = 0.120					
Adjusted R ² = 0.115					
Standard error of the estimate = 2.856					
Increment of the R ² = 0.022					
F = 9.029					
P = 0.003					
Regression Weights					
Independent variables	B coefficient	Beta coefficient	t	p	VIF collinearity
Constant	13.237	-	25.429	0.000	-
Psychological motives	1.118	0.413	7.007	0.000	1.455
Health motives	-0.575	-0.177	-0.3005	0.003	1.455
Variance Analysis					
Effect	Sum of squares	DF	Mean squares	F	p
Regression	410.367	2	205.184	25.155	0.000
Residual	30009.816	369	8.157		
Total	3420.183	371			

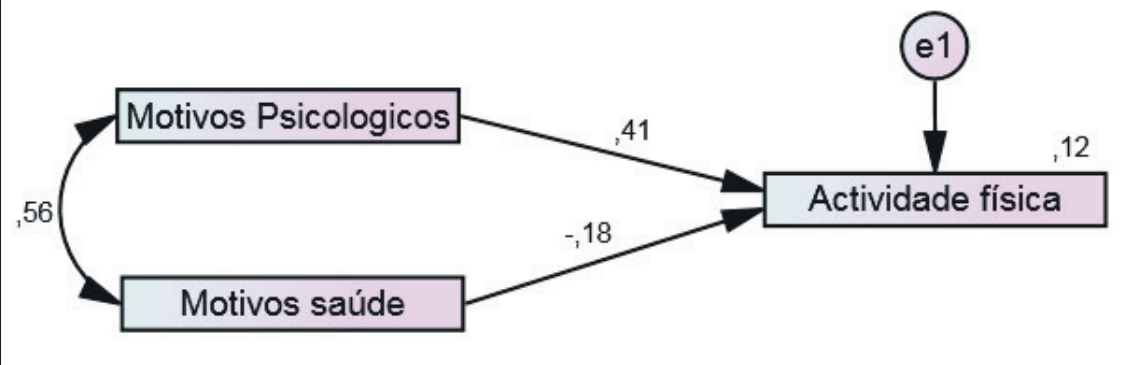
Note. R2 = Coefficient of determination; F = ANOVA (Analysis of Variance); p = Probability of significance; t = t-test; VIF = Variance inflation factor; DF = Degrees of freedom.

Figure 1 represents the fitted model with the standardized coefficients. In this model, the regression or path coefficients are psychological motives (β psychological motives = 0.41) and health motives (β health motives = -0.18). The model

explains about 12% of the observed variation in physical activity across the different variables. The r-value, among the independent variables, is $r = 0.56$, with an explained variance for these variables of 31.36%, as observed in Figure 1.

Figure 1

Schematic representation of the multiple regression between physical activity and motivation (Psychological motives, Health motives, Physical Activity)



Discussion

The present study observed that the more psychological motives students have, the greater the practice of physical activity, and the greater the health motives, the greater the practice of physical activity. These results also corroborate other studies, such as Miyawaki et al.'s (2019), according to which nursing students' motives to engage in physical

activity were related to health motives, including reducing the stress and anxiety caused by academic demands. Tobar et al. (2018) also identified health maintenance as a reason for physical activity practice in university students, with "laziness" being the primary explanation for lack of practice. Motivation is an essential factor in physical activity practice. Evidence confirms that a higher level of physical activity leads to a better quality of life, exist-

ing a positive relationship between them (Çiçek, 2018). According to Cilar et al. (2017), the factors inherent in nursing students' physical inactivity are lack of time, academic obligations, time of year, and lack of financial conditions. Physical inactivity is also conditioned by the way of thinking and lack of motivation. Nevertheless, students who do not practice regular physical activity demonstrated understanding its benefits and reported social and well-being stimuli. The same study revealed that the influence of friends and family was a relevant motivational factor for nursing students to engage in physical activity.

The prevalence of physical inactivity among nursing students seems to result from several factors. Lack of time may be a possible reason considering the demands of the undergraduate nursing program as the theoretical and practical (clinical teachings) components absorb most of the students' time, further exacerbating the high prevalence of physical inactivity (Cilar et al., 2017).

In this study, psychological and physical motives predict physical activity among nursing students. This corroborates the results of Miyawaki et al. (2019). These authors also observed that students were motivated by extrinsic factors such as weight control and intrinsic factors such as relieving stress and anxiety arising from academic life, i.e., feeling psychologically well.

The present study also demonstrates that the older the student, the lower the level of physical activity. Moreover, male students practice more physical activity, and 2nd and 3rd-year students have the highest level of physical activity. The study by Lipošek et al. (2018) observed that male students performed better than female students and that 2nd-year students had higher rates of physical activity. Lemos et al. (2021), in a study with 535 students, found that 55.3% of students did not exercise regularly, male students had higher intrinsic motivation values than female students, and female students had a lower frequency of exercise than male ones.

Conclusion

This study achieved its initial objective by concluding that psychological and health-related motives led to a greater practice of physical activity among the nursing students under study. Younger students attending the 2nd and 3rd years and male students had the highest prevalence of physical activity.

Considering the results obtained, health education programs must be developed to motivate students to engage in physical activity, promoting well-being. It will be essential to support students in their transition from secondary school to higher education to ensure that physical activity practice continues, as the subject of physical education is an integral part of school curricula up to the secondary level. Therefore, it should be included in higher education curricula as a sound basis for regular physical education among higher education students. Higher education institutions should promote physical activity planning, for example, as part of inclusive programs for

the entire educational community and an integral part of scientific-pedagogical plans. It is necessary to follow and monitor students in their practice of sport to demonstrate the gains in health and well-being, according to the duration, intensity, and frequency of the physical activity. The richness of stimuli when exploring the area of physical activity promotion in higher education students can be a means to develop their sensory, motor, cognitive, and emotional skills in an integrated and holistic way. The practice of physical activity by nursing students improves their cardiorespiratory and muscular endurance, body posture, and flexibility, essential elements in professional nursing activity.

The sample size of this study can be a limitation. Thus, further studies with larger samples should be conducted, considering the results obtained. As an implication for practice, we recommend implementing and monitoring programs for physical activity as an added value for students' adherence to the practice and knowledge of the benefits of physical activity.

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