ORIGINAL ARTICLE

Levels of physical activity among students of Human Medicine at a university in northern Peru during the COVID-19 pandemic

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The present study is part of an undergraduate research conducted by students Villarreal-Suyon B and Céspedes-Chávez L, under the supervision of Becerra-Gutiérrez L. *Niveles de actividad física en estudiantes de Medicina Humana en una universidad al norte del Perú durante la pandemia por COVID-19* (Levels of physical activity among students of Human Medicine at a university in northern Peru during the COVID-19 pandemic). [Undergraduate research]. Chiclayo: School of Human Medicine, Universidad de San Martín de Porres; 2021.

ABSTRACT

Objective: To identify the levels of physical activity among students of Human Medicine at a university in northern Peru during the COVID-19 pandemic.
Materials and methods: An observational, descriptive study conducted on 254 first- to fifth-year students of Human Medicine who were administered the International Physical Activity Questionnaire Short Form (IPAQ-SF) in 2021.
Results: A total of 48.03 % of the students had a moderate level of physical activity. The sociodemographic characteristics most commonly observed were the female sex in the light (64.56 %) and vigorous (59.26 %) levels of physical activity and the male sex in the moderate (55.37 %) level of physical activity. Concerning the age, the youth stage predominated in all levels (light: 58.44 %, moderate: 62.60 % and vigorous: 61.11 %), contrary to the young adult stage, where all levels obtained the lowest percentage. According to the year of studies, second-year students stood out in the light (36.71 %), moderate (36.07 %) and vigorous (58.49 %) levels, in contrast to fourth-year students, who achieved the lowest percentage in all levels (light: 3.8 %, moderate: 26.23 % and vigorous: 3.77 %). Finally, regarding the light level of physical activity, the mean number of hours sitting per day was 7.88 compared to the vigorous level, which attained a mean of 3.23.
Conclusions: Most of the students of Human Medicine at a university in northern Peru had a moderate level of physical activity during the COVID-19 pandemic in 2021. The most prevailing sociodemographic characteristic was the female sex with a light level; those in the youth stage and the second year of studies showed all levels of physical activity. Moreover, students with a light level of physical activity remained seated for more hours compared to the other levels.

Keywords: Students, Medical; Sedentary Behavior; COVID-19 (Source: MeSH NLM).

INTRODUCTION

COVID-19 triggered one of the most unexpected and challenging pandemics, leading to approximately two years of population-wide isolation [1-3] which impacted health across all areas. Long before the pandemic, in 2002, the World Health Organization (WHO) estimated that 57 million people died each year, with two million of these deaths attributed to sedentary lifestyles [1,4]. Similarly, in the same year, the Pan American Health Organization (PAHO) reported 170,000 deaths in Latin America and the Caribbean alone associated with physical inactivity [5].

With the onset of COVID-19, a large portion of the population was forced to stay at home, engaging in activities such as online learning or remote work, which led to long periods of inactivity. As a result, university students, among others, became sedentary [2,6-9].

Studies such as Villanueva Carlo's indicate that, during the COVID-19 pandemic, most students of Human Medicine showed light levels of physical activity (74.26 %), followed by moderate (17.41 %) and vigorous (8.32 %) levels [10].

Therefore, this study aimed to determine the levels of physical activity among students at a university in northern Peru during the COVID-19 pandemic in 2021.

MATERIALS AND METHODS

Study design and population

A descriptive cross-sectional study was conducted on a target population of first- to fifth-year students enrolled in the Human Medicine program at the Universidad de San Martín de Porres, Filial Norte (Northern Branch), between August and November 2021.

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A sample of 254 students was selected based on inclusion criteria, which required students to be enrolled in the 2021-II academic semester, be between 18 and 27 years old, and have completed at least two consecutive semesters under the online modality. Exclusion criteria included students with enrollment reservation, those with physical activity limitations due to previous injuries or chronic diseases, and those who submitted incomplete questionnaires.

Variables and measurements

The variables assessed included levels of physical activity and sociodemographic characteristics such as sex, life stages [11] and year of studies.

The levels of physical activity were measured using the International Physical Activity Questionnaire Short Form (IPAQ-SF), which consists of seven questions based on frequency, intensity and duration of activities. Physical activity was quantified in METs (metabolic equivalents of tasks) per minute and per week [12]. Reference values for METs [13] were 3.3 METs for walking, 4 METs for moderate physical activity and 8 METs for vigorous physical activity.

To calculate the METs, each value (3.3, 4 or 8 METs) was multiplied by the duration of the activity in minutes per day and by the number of days per week that the activity was performed. For the categorization into levels of activity, the following was used [13]: light level (no physical activity or insufficient activity to reach moderate or vigorous levels), moderate level (an energy expenditure of at least 600 METs) and vigorous level (an energy expenditure of at least 3,000 METs).

Statistical analysis

The IPAQ-SF, adapted with Google Forms, was used to assess each student. This questionnaire has been recommended and validated in 12 different countries for monitoring and research purposes. It categorizes physical activity into three levels: vigorous, moderate and light. The results were tabulated, and descriptive statistics were applied.

Ethical considerations

The research was conducted in accordance with ethical considerations, including approval from the Research Ethics Board of the School of Human Medicine at the Universidad de San Martín de Porres (Document No. 1306-2021-CIEI-FMH-USMP).

RESULTS

Out of the 254 students of Human Medicine, 53.94 % were males and 46.06 % were females. The most prevalent age group was 20-24 years, corresponding to the youth stage, with 61.02 %. In terms of the year of studies, the largest number of participants were in their second year, representing 40.94 % (Table 1).

Table 1. Characteristics of students of Human Medicine at a university in northern Peru during the COVID-19 pandemic in 2021

Characteristics		*n*	%
Sex	Female	117	46.06
	Male	137	53.94
Life stages	Late adolescence (18-19 years)	74	29.13
	Youth (20-24 years)	155	61.02
	Young adulthood (25-27 years)	25	9.84
Year of studies	First	54	21.26
	Second	104	40.94
	Third	43	16.93
	Fourth	13	5.12
	Fifth	40	15.75

According to Table 2, a total of 48.03 % of the students exhibited a moderate level of physical activity, followed by 32.28 % with a light level and 19.69 % with a vigorous level.

Table 2. Level of physical activity among students of Human Medicine at a university in northern Peru during the COVID-19 pandemic in 2021

Level of physical activity	*n*	%
Light	82	32.28
Moderate	122	48.03
Vigorous	50	19.69

According to Table 3, most students with a light level of physical activity had a higher mean of 7.88 hours of sitting per day, with a standard deviation (SD) of 1.90 hours. For those with a moderate level of physical activity, the mean was 4.53 hours, with a SD of 1.47 hours. Students with a vigorous level of physical activity had a mean of 3.23 hours of sitting per day, with a SD of 1.01.

Table 3. Measures of central tendency for hours of sitting per day according to the level of physical activity among students of Human Medicine at a university in northern Peru during the COVID-19 pandemic in 2021

Level of physical activity	Hours of sitting per day	
	Media	SD
Light	7.88	1.90
Moderate	4.53	1.47
Vigorous	3.23	1.01

According to Table 4, the female sex had a higher percentage in the light (64.56 %) and vigorous (59.26 %) levels of physical activity, compared to the male sex, which obtained 35.44 % in the light level and 40.74 % in the vigorous level. However, the male sex exhibited a higher percentage (55.37 %) in the moderate level of physical activity compared to the female sex, which obtained 44.63 %. Additionally, the youth stage showed higher percentages of physical activity across all levels: light (58.44 %), moderate (62.60 %) and vigorous (61.11 %). In contrast, the young adulthood stage exhibited the lowest percentages of physical activity: light (6.49 %), moderate (8.13 %) and vigorous (18.52 %). Regarding the year of studies, second-year students presented higher percentages of physical activity at the light (36.71 %), moderate (36.07 %) and vigorous (58.49 %) levels. Conversely, fourth-year students had the lowest percentages of physical activity across all levels, with 3.80 % in the light level, 6.56 % in the moderate level and 3.77 % in the vigorous level.

Table 4. Sociodemographic characteristics related to the level of physical activity among students of Human Medicine at a university in northern Peru during the COVID-19 pandemic in 2021

Sociodemographic characteristics	Level of physical activity					
	Light		Moderate		Vigorous	
	n	%	*n*	%	*n*	%
Sex						
Male	28	35.44	67	55.37	22	40.74
Female	51	64.56	54	44.63	32	59.26
Life stages						
Late adolescence (18-19 years)	27	35.06	36	29.27	11	20.37
Youth (20-24 years)	45	58.44	77	62.60	33	61.11
Young adulthood (25-27 years)	5	6.49	10	8.13	10	18.52
Year of studies						
First	27	34.18	20	16.39	7	13.21
Second	29	36.71	44	36.07	31	58.49
Third	14	17.72	18	14.75	11	20.75
Fourth	3	3.80	8	6.56	2	3.77
Fifth	6	7.59	32	26.23	2	3.77

DISCUSSION

The study found that, during the COVID-19 pandemic in 2021, students of Human Medicine at the Universidad de San Martín de Porres, Filial Norte, predominantly exhibited moderate levels of physical activity, with 48.03 %, according to the IPAQ-SF survey. These results differed from other national and international studies conducted during the pandemic. For instance, Alarcón Trujillo et al. found that 42.9 % of their population engaged in vigorous levels of physical activity, while 48.8 % and 38.4 % had moderate and light levels, respectively [14]. Similarly, studies such as Villanueva Carlo's indicated that 74.3 % of students of Human Medicine showed light levels of physical activity [10]. According to Aucancela Buri et al., vigorous and moderate levels of physical activity decreased during lockdown by 21 % and 27.3 %, respectively, while light levels of physical activity increased by 51.7 % [15]. Furthermore, Espinoza-Gutierrez et al. reported a 53.95 % reduction in physical activity due to the pandemic [16]. This may have resulted from the restrictions imposed by the Peruvian government in response to the outbreak of the novel disease. However, with the arrival of new COVID-19 vaccines in 2021, the country began to recover from the severe impact of the pandemic, including the widespread sedentary lifestyle. This recovery was supported by the easing of restrictions, which led to an increase in daily walking and physical activity [17].

The research also explored the correlation between physical activity and sociodemographic characteristics such as sex. It was observed that the highest percentage of female students of Human Medicine engaged in vigorous level of physical activity (59.26 %) compared to their male counterparts (40.74 %). This may be related to the use of technology, as Giachetto et al. found that the frequency of sedentary activities increased due to technology use (e.g., PC and cell phone games), particularly in males ($p < 0.05$), with 32 %, compared to 16 % among females [18]. This could explain the higher prevalence of sedentary lifestyle in males. Gallo et al. also noted a significant decrease in physical activity among both sexes in 2020 compared to 2018 and 2019 [19]. Another possible explanation for the findings is that the female sex may have better adapted to lockdown, following WHO recommendations [1,20]. For instance, Rodríguez-Larrad et al. found that females were more likely to engage in high-intensity interval training and relaxation activities [21,22].

Regarding life stages, the study showed that the young adulthood stage (20-24 years) prevailed across the three levels of physical activity: light (58.44 %), moderate (62.60 %) and vigorous (61.11 %). This finding aligns with a study conducted among medical interns at the Universidad Nacional Mayor de San Marcos during the 2021 online classes period, which also showed that the 20-24 age group exhibited the highest percentages across all levels of physical activity: low (34.7 %), moderate (23.5 %) and high (11.2 %) [11]. This similarity could be attributed to the persistence of low physical activity habits despite the lifting of COVID-19 restrictions or to the fact that medical students spend most of their time in hospitals or attending hybrid classes, which leads to a lifestyle with low physical activity and a tendency towards a sedentary lifestyle [23]. On the other hand, studies conducted before the pandemic, such as that by Rangel Caballero et al., indicate that university students aged 18-25 years, corresponding to the late adolescence to young adulthood stages, predominantly engaged in light levels of physical activity [24]. This might be because, during those years, physical activity and sedentary habits—currently considered as risk factors associated with various chronic noncommunicable diseases (NCDs) such as hypertension, diabetes mellitus, coronary heart disease, among others—were not given as much importance [4,6,7]. In this context, it is evident that, despite the passage of time, university students have not developed a habit or appreciation for engaging in physical activity.

On the other hand, there was an increase in the number of hours of sitting per day in the light level of physical activity, with a mean of 7.88—which was the most prevalent—compared to the vigorous level, with a mean of 3.23 and the moderate level, with a mean of 4.53. This finding is consistent with the study by Ammar et al., who reported an increase in hours of sitting per day of 5 to 8, likely due to the global mandatory lockdown during the COVID-19 pandemic [25]. Similarly, Romero C et al. demonstrated an increase in sitting time in front of a computer due to the shift to online learning [26]. Constandt et al. emphasized that the availability of time for physical activity was compromised due to the pandemic and the transition to virtual environments, which led both highly active and inactive individuals to increase their sedentary lifestyle [27,28].

Regarding the year of studies, second-year basic sciences students presented higher percentages in the light (36.71 %), moderate (36.07 %) and vigorous (58.49 %) levels of physical activity, whereas the lowest percentage was observed in fourth-year clinical sciences students [29,30]. This contrasts with the study conducted by Tovar, which showed that fifth-year clinical sciences students had higher levels of physical activity than their first-year basic sciences peers, with 8.1 % versus 21.3 % of inactivity, respectively [31]. Conversely, according to Luciano, first- to sixth-year students experienced a reduction in physical activity and an increase in sitting time, as walking to the university and/or clinics was their primary form of physical activity [32].

In conclusion, most of the students of Human Medicine at a university in northern Peru had a moderate level (48.03 %) of physical activity during the COVID-19 pandemic in 2021.

The most prevalent sociodemographic characteristic was the female sex with a light level of physical activity. The youth stage prevailed from the other stages and the second year of studies excelled in all levels of physical activity. Moreover, students with a light level of physical activity remained seated for more hours compared to those with a vigorous level.

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