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Original Article

NÍVEL DE ATIVIDADE FÍSICA E FATORES RELACIONADOS EM UNIVERSITÁRIOS DA ÁREA DA SAÚDE: UM ESTUDO LONGITUDINAL

LEVEL OF PHYSICAL ACTIVITY AND RELATED FACTORS AMONG UNIVERSITY STUDENTS IN THE HEALTH FIELD: A LONGITUDINAL STUDY

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RESUMO
A inatividade física ocupa o quarto lugar entre os principais fatores de risco de mortalidade a nível mundial. Objetivou-se relacionar a mudança ou aumento do nível de atividade física com variáveis socioeconômicas e do estilo de vida no período de seis meses em universitários da área da saúde. Trata-se de um estudo longitudinal, constituído por 167 universitários da área da saúde do nordeste brasileiro. Utilizou-se como instrumento o questionário "Mapa de Atividade Física e Saúde- MAFIS". Os dados foram analisados por meio de estatística descritiva em forma de frequência e percentual, teste de Qui quadrado, com posterior montagem do modelo de regressão logística. Os resultados mostram que ss universitários que responderam serem "pouco capazes" de acordar uma hora mais cedo para fazer atividade física estão protegidos em 78% (OR: 0,217; IC: 0,056-0,83) contra a pratica de AFLAZ comparado aos que se consideram "bastante capazes". Conclui-se que a disposição para acordar 1 hora mais cedo se relaciona a fazer atividade física em um período de seis meses em universitários da área da saúde.
Palavras-chave: Atividade Física. Estudantes Universitários. Saúde.

ABSTRACT
Physical inactivity ranks fourth among the main risk factors for mortality worldwide. The objective of this study was to relate changes or increases in level of physical activity to socioeconomic and lifestyle variables in a six-month period among university students in the health field. This is a longitudinal research involving 167 university students in the health field in northeastern Brazil. The questionnaire "Physical Activity and Health Map" [*Mapa de Atividade Física e Saúde*] (MAFIS) was used as an instrument. Data were analyzed by means of descriptive statistics, as frequency and percentage, of a Chi-square test and, subsequently, with the designing of a logistic regression model. The results show that the university students who answered that they were "barely able" to wake up an hour earlier to do physical activity were 78% protected (OR: 0.217; CI: 0.056-0.83) against engaging in LEIPA compared to those who consider themselves "quite capable". It is concluded that willingness to wake up 1 hour earlier is related to exercising in a six-month period among university students in the health field.
Keywords: Physical Activity. University Students. Health.

Introduction

Urbanization, socioeconomic transformations (such as greater access to income, education, and access to information), increased industrialization, mechanization, and the influence of globalization have impacted the population's lifestyle habits[1,2].

These typical factors of the development of human society have contributed to raising the prevalence of health risk factors, such as physical inactivity, which is the main and independent risk factor for several Chronic Non-Communicable Diseases-CNCDs[3-5]. Such changes led physical activity to be studied as a fundamental piece for prevention and health promotion[6].

According to the World Health Organization[7], insufficient physical activity ranks fourth among the main risk factors for mortality worldwide, affecting 1 in 3 adults; people with insufficient levels of Physical Activity are 20% to 30% more likely to die compared to those who exercise for at least 30 minutes on most days of the week. These data show that 3.2 million people pass away every year due to physical inactivity[7].

Data on the prevalence of physical inactivity in 122 countries found that 31% of the world population aged 15 years or older are below the recommended levels of PA for health[8]. In Brazil, six out of ten people (62.1%) aged 15 or older did not do any sports and/or physical activity between September 2014 and 2015, against 37.9% who did, that is, over 100 million individuals are sedentary, while 61.3 million consider themselves more active[9].

In the context of higher education institutions, several studies, mostly cross-sectional, have reported high levels of insufficient physical activity among university students[10-15]. These findings can be justified by this being a population that tends to be composed of young adults with greater chances of developing diseases such as type 2 diabetes mellitus, due to an academic routine influenced by technology and that requires little physical effort, as well as by fast and practical eating[16].

According to the Higher Education census conducted by the Brazilian Ministry of Education[17], between the years 2008 to 2018 the number of students enrolled in higher education rose from 5,843,322 to 8.45 million, which means a 44.6% increase. Said data represent that a significant portion of the population is in college. These individuals are in the process of building new social relationships, with the possibility of adopting inappropriate habits and lifestyles, such as alcohol consumption, tobacco smoking, poor diet, overweight and obesity, as well as other risk factors[18].

Bearing in mind that most university students are young, this phase is opportune for the consolidation of their lifestyle and the adoption of habits that will have an impact on their future health[19]; identifying these behaviors represents the beginning of a decision making towards proposing policies and strategies that can enable a change of habits for the community and the application of interventions to promote physical activity. To this end, it is believed that there is a need for further investigations with a longitudinal design that present evidence of cause and effect as to the influence of determinants (biological, social, behavioral and environmental variables) and correlates on engagement in leisure-time physical activity by university students. Thus, our hypothesis is that university students who have one or more indicators that present themselves as barriers and limitations to physical activity are less likely to become active (to reach the recommendations of 150 minutes of physical activity) in the next six months, following the baseline. In this sense, the present study aims to relate changes or increases in level of physical activity to socioeconomic and lifestyle variables in a period of six months among university students in the health field.

Methods

This is a longitudinal study, with a non-probabilistic sample, approved by the Research Ethics Committee Involving Human Beings (opinion No: 1.854. 595). All participants were informed about the objectives and procedures to which they would be subjected and signed a free and informed consent form. Data collection was divided into two assessments, with a six-month interval, the first between December 2016 and February 2017, and the second between June and August 2017.

Participants

A total of 167 university students in the health field participated in the study; they were regularly enrolled in the nine undergraduate courses in the health field (Teaching and Bachelor's degrees in Physical Education, Biological Sciences, Nursing, Nutrition, Medicine, Oceanography, Dentistry and Pharmacy) at the Federal University in São Luís, Maranhão.

To calculate the sample, the level of physical activity as a form of leisure was considered among adults in the city of São Luís, MA, in 2014, which corresponds to 36.9%[20]. The hypothesis of a change in said level within the sample classified as having "positive indicators"

and "negative indicators" to reach the recommendations: a 50% likelihood of the event happening. With a 95% test power, a 5% level of significance, a two-tailed hypothesis test, and using the formula proposed by Lwanga and Lemeshow[21] for longitudinal designs, the calculation resulted in 73 subjects per classification group to compose the sample; considering the study model, a 30% loss was added from the initial to the final moment[22] and, thus, the final calculation required was 95 subjects per group.

Procedures

For data collection, an online survey entitled "Physical Activity and Health Map" [*Mapa de Atividade Física e Saúde*] (MAFIS) was used, an instrument that has been validated and is in the process of being published, consisting of 41 questions divided into four thematic blocks: a) Level of habitual and current physical activity – LPA; b) Potential for change in level of physical activity; c) Self-efficacy; d) Preferences for engaging in physical activity, and social support, in addition to user identification questions.

The MAFIS instrument was made available on Google Forms, a free-of-charge form platform that, in addition to allowing the creation of surveys, stores the information collected. To announce the study, posters and banners were posted in the buildings of the courses involved; in the virtual environment, the research was announced on a social network (Facebook) and a messenger app (WhatsApp), and these resources were chosen for their ease of use, such as link insertion and the reach they have, in addition to their low cost.

The list with the students' required information was obtained through the Dean's Office of Education [*Pró-Reitoria de Ensino*] (PROEN) belonging to the university. Afterwards, e-mails were sent with invitations and explanations about the survey, along with a link to the electronic address for access to the MAFIS questionnaire. The consent form was attached at the beginning of the questionnaire; after reading and consenting, the subjects, if they agreed to participate in the study, would click on "Yes", which corresponded to "I am interested in participating in the study". Right after, the content of the survey would load and be available for completion; if the answer was "No", which corresponded to their desire not to participate in the study, the participant would see a message thanking them, and the survey could not be accessed.

The LPA analysis was restricted to the "leisure-time physical activity – LEIPA" variable. To this end, a weekly physical activity score was developed, based on the recommendations of 150 minutes per week proposed by the World Health Organization (WHO); it calculated the weekly frequency (days) as a function of the average length (minutes) multiplied by the weight of the activity (1 = mild to moderate; 2 = moderate to vigorous; 1.5 = fits both types), and the subjects were classified, after the calculations, in accordance with the score obtained in minutes, where a) = 0 minutes/week – inactive; b) < 150 minutes/week – insufficiently active; c) ≥ 150 minutes/week – physically active; and d) = > 300 minutes/week – very active.

Statistical analysis

Data analysis was performed using descriptive statistics in the form of absolute and percentage frequencies. The Chi-square test was used to verify possible associations between the dependent variable (LPA) and the independent ones (sex, length of physical activity, liking for doing physical activity, time spent in active commute, time dedicated to studying, and waking up 1 hour earlier to exercise).

The final model was composed only of the variables that presented a value of $p \leq 0.20$, which were selected and sorted in ascending order, in accordance with the significance value to enter the logistic regression model; the odds ratio (OR) estimates were built, with 95%

confidence intervals (95% CI). The level of significance adopted was 5%, using the software SPSS, version 23.0.

Results

The sample consisted of undergraduate students in the health field; 284 agreed to participate in both moments (before and after the six months), and the 167 subjects (58.8% of the sample) who did not reach the recommendations of 150 minutes of physical activity in the first moment of the study were considered for analysis.

Table 1 presents data related to the socioeconomic profile and variables referring to the university students' lifestyle. Most participants are female (70.1%), aged between 18 and 25 years old (74.9 %), single (63.5%), have a family income of up to 1,500.00 BRL (53.3%), do not prioritize PA (52.5%), dedicate 4 hours or more to studying (57.5%), do not consider doing PA (94%), and do not do PA (59.9%).

Table 1. Description of the sample of university students in the health field, by sex, course and physical activity variables. São Luís- MA, 2018

Variables		f	%
Undergraduate courses	Nursing	33	19.8
	Medicine	23	13.8
	Physical Education - Teaching	11	6.6
	Others (Physical Education (Bachelor's), Biology, Pharmacy, Nutrition, Oceanography and Dentistry)	100	60
Sex	Male	50	29.9
	Female	117	70.1
Age group	18 to 25 years	125	74.9
	26 to 34 years	37	22.2
	Over 35 years	5	3
Marital status	Single	160	63.5
	Dating	52	31.1
	Stable relationship or married	9	5.4
Family income	Up to 1,500.00 BRL	89	53.3
	Over 1,500.00 and 2,500.00 BRL	76	45.5
	I do not know/I do not want to answer	1	0.6
Length of sleep	Up to 06 hours	82	49.1
	Between 6 and 8h	80	47.9
	Above 8h	5	3
Prioritizes LEIPA	No	149	52.5
	Yes	135	47.5
Time dedicated to studying	None	12	7.2
	Up to 3 hours	59	35.3
	4 hours or more	96	57.5
Consider doing LEIPA?	No	157	94
	Yes	10	6
Enjoy doing LEIPA?	No	101	60.5
	Yes	66	39.5
Work hours	Do not work	97	58.1
	Up to six hours	29	17.4
	8 hours or more	41	24.6
Level of LEIPA	Inactive	100	59.6
	Insufficiently active	67	41.6
TOTAL		284	100

Note: LEIPA – leisure-time physical activity; f – frequency
Source: The authors

After the association between the dependent variable (LLEIPA) and the independent variables (sociodemographic and lifestyle) was tested, only the "enjoy doing PA", "time

dedicated to studying", "active commute" and "sex" variables presented a value of $p \leq 0.20$ and entered the regression model.

Table 2 shows the final logistic regression model, adjusted by the "time dedicated to studying" variable; the university students who answered that they were "barely able" to wake up an hour earlier to do physical activity are 78% protected against LEIPA compared to those who consider themselves "quite able" to wake up an hour early.

Table 2. Logistic regression adjusted by the "time dedicated to studying" variable, São Luís, MA, 2018

Variables	p value	OR	95% CI
Hours dedicated to studying			
None	0.220		
1 hour	0.559	2.649	0.101 - 69.29
2 hours	0.438	0.248	0.007-8.39
3 hours	0.217	9.921	0.25-379.53
4 hours or more	0.644	2.000	0.106-37.68
Waking up an hour earlier to exercise	0.026	0.217	0.056 - 0.83
Constant	1.000	1.000	

Note: OR – odds ratio; 95% CI – confidence interval
Source: The authors

Discussion

The present study showed that those university students who claimed to be barely able to wake up an hour earlier are 78% protected (OR: 0.217; CI: 0.056-0.83) against doing physical activity compared to those who consider themselves quite able.

The profile of the participants in the sample is composed mostly of women, aged between 18 and 25 years, who do not like, do not consider and do not prioritize doing physical activity, and have an income of up to 1,500.00 BRL. According to Colares, gender and lower income are factors that decrease the likelihood of people being active[23]. In addition to socioeconomic factors, variables such as disliking physical activity have been mentioned in the literature. A study conducted at the Federal University of Pelotas with 485 university students found a positive association; enjoying leisure-time physical activity is associated with LPA[24], corroborating with the findings. According to data from the IBGE household sample survey, "disliking" is among one of the main reasons why people do not do physical activity or sports[9], an evidence that helps explain the fact that they do not consider, mostly, and therefore do not prioritize the adoption of a regular engagement in physical activity.

Because they are university students, it is believed that four hours or more dedicated to studying is an acceptable behavior, as they are exposed to a high load of academic work and obligations, participation in extension projects and other curricular activities. A research developed with university students in the health field at an institution in northeastern Brazil found that the main barrier to them doing PA was associated with their heavy study load[25].

As for engagement in physical activity, there was a high prevalence of leisure-time physical inactivity; 59.6% of the participants said that they do not do any physical activity in their free time. Similar prevalences are presented by VIGITEL in 2016 for adults in the city of São Luís, MA; summing the proportions of inactive and insufficiently active individuals, a high prevalence, ranging from 58.5 to 64%, is observed[17]. Corroborating with this research, a study that sought to assess physical activity among 388 undergraduate students, using the IPAQ at a Federal University in the South of the State of Minas Gerais, found a high prevalence (59.3%) of physically inactive subjects[13]. Another research, characterized as a systematic review, sought to investigate insufficient physical activity among Brazilian university students between the

years 2006 and 2011. The data analyzed in 14 studies concluded that university students presented high prevalences of physical inactivity or low levels of physical activity, either in global terms or in their leisure time[18]. Such results are close to the findings of the present study and evidence a problem with regard to regular engagement in physical activity in this population. This behavior may be due to the fact that entering university marks the beginning of new social relationships, with the possibility of adopting sedentary habits and lifestyles[12].

As shown in this study, the only lifestyle variable related to change or increase in LPA after a six-month period was "waking up an hour earlier to exercise", adjusted by the "time dedicated to studying" variable. The university students who claimed to be barely able to wake up an hour earlier are 78% protected against doing physical activity. Waking up early is a variable present in the self-efficacy block of the MAFIS questionnaire, which focuses on investigating an individual's ability to adopt or change habits. According to a systematic literature review[26] that sought to analyze why some people are active and others are not, published in the journal The Lancet, self-efficacy appears in longitudinal studies as a determining variable for engagement in physical activity among adults. A cross-sectional study carried out by Araújo and Ferreira[27] found that university students in the health field were not willing to exercise in the morning ($p > 0.003$). This group is dissatisfied when it comes to their sleep quality and willingness to perform everyday tasks[28]. Our results show that approximately 50% of the sample does not sleep the minimum of eight hours suggested by the literature to have quality of life; such facts can help explain why they are protected against engagement in physical activity.

Physical activity is understood as a phenomenon of biological and cultural dimensions, inherent to the human being, representing a complex and multifactorial health determinant that is difficult to change in populations[29]. The literature contains an expressive number of cross-sectional studies, which, albeit essential, present associations; about said associations, from a statistical point of view, it is not certain whether they would be significant in studies with longitudinal designs, as they do not respond to changes in behavior throughout one's academic life, which represents, according to Souza, a lack of methodologies and designs that can assess the cause-and-effect relationship in this population[30]. The fact that our design is longitudinal may contribute to explaining why our findings differ from those of other publications that have analyzed health-related behaviors in university students. It is worth stressing that the present investigation uses an instrument capable of measuring a larger set of variables, which, from the point of view of epidemiology, is recommended so that the researcher is convinced of the relationship of the variable with the outcome[31]. In the field of physical activity epidemiology, this is completely acceptable, since, according to Baumam et al.[27], there are more than 70 variables that associate with physical activity in populations living in low- and middle-income countries, including biological, social, behavioral and environmental variables.

This study has its limitations, as well as strengths that need to be mentioned. One limitation is the six-month interval between measurements because, when it comes to complex behaviors, they might need a longer timeline to be explained. In a positive way, the longitudinal design stands out, making it possible to understand the causal relationship, as to time, between health conditions and engagement in physical activity among university students, since the knowledge about these determinants can be used to minimize sedentary behaviors and taken into account to base more effective strategies that meet the characteristics and particularities of groups and populations, with spaces and options for exercising on campus; the use of an instrument (online survey) designed specifically for a virtual environment is worth noting too, as it is a promising tool to decrease financial costs in data collections and reach more subjects in epidemiological studies.

Conclusions

It is concluded that willingness to wake up 1 hour earlier is related to a change or increase in level of physical activity in a six-month period among university students in the health field.

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