

Risk Behaviors for Chronic Noncommunicable Diseases in Medical Students

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Abstract

University students have adopted an unhealthy lifestyle, implementing behaviors that can contribute to the development of Chronic Non-Communicable Diseases (CNCDs). Few studies assess the coexistence of CNCD risk behaviors among medical students. This study aimed to evaluate the clustering of CNCD risk behaviors among medical students and to verify the associated factors. This is a cross-sectional study, carried out with students from the 3rd and 9th semesters of three medical schools in the north of Minas Gerais. By using previously validated instruments, the risk behaviors evaluated were inadequate diet, alcohol abuse, smoking, and physical inactivity. Data collection was carried out in educational institutions using previously validated instruments. Associated factors were identified through multiple binary logistic regression analysis. 209 students participated in the study. The prevalence of clustering of three or more CNCD risk behaviors was 22.0%. The multiple analysis, controlled by sex and age group, revealed that the clustering of risk behaviors was associated with the presence of depressive symptoms (OR=2.22; 95%CI=1.09-4.54) and excessive daytime sleepiness (OR =2.15; 95%CI=1.07-4.30). The results highlight a high frequency of clustering of CNCD risk behaviors in the studied group and highlight the need for greater surveillance of routine and mental health aspects of medical students.

Keywords: Medical Students. Lifestyle. Risk Factors. Chronic Disease.

INTRODUCTION

The concern with the quality of life of medical students has instigated several studies, as there are stressful factors in medical education that directly reflect on the health of students¹⁻³. It is not uncommon for university students in general to adopt an unhealthy lifestyle, and medical students, despite their knowledge in the area of health, also adopt lifestyle habits that are harmful to their own

health⁴⁻⁶.

Situations such as a lack of free time, pressure for good performance, competitiveness in the course, participation in extracurricular activities, doubts about their academic-professional future, little time devoted to sleep, and inadequate nutrition are commonly experienced by medical students and can have repercussions for their

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well-being⁷. Unhealthy behaviors draw the attention of researchers, who have sought to know not only the health conditions of university students, but also to understand the aspects that are related to such behaviors in order to find ways to prevent chronic diseases, which have as a common etiology a set of factors fundamentally linked to lifestyles⁸⁻¹⁰.

Risk factors for Chronic Non-Communicable Diseases (CNCDs) are related to lifestyle habits, including obesity, sedentary lifestyle, inadequate diet, and smoking¹¹. Although the role of each of these risk factors is well established, their agglomeration, in addition to occurring systematically, aggravates and favors a worse prognosis, considering the additive effect of the association^{12,13}. It is worth noting that the simultaneousness or agglomeration of these

factors is relatively common, considering the great interrelationship between them. This fact has been increasingly common throughout the world and has been considered a public health problem due to its impact, and one that needs effective interventions¹⁴.

The clustering of CNCD risk factors has been investigated for several population groups, but the literature still does not record studies on the subject among medical students. This audience tends to consolidate habits (appropriate or not) and, as health professionals, represent models to be followed. Therefore, it is important to investigate and understand more deeply the health-related behaviors of this group. Therefore, the present study aimed to evaluate the clustering of CNCD risk behaviors in medical students and verify the associated factors.

METHODOLOGY

This is a quantitative, cross-sectional study carried out with medical students in the north of Minas Gerais. This study is an integral part of a broader survey that longitudinally follows the health conditions of medical students. For the present study, there was no sample size calculation, and all students attending the 3rd and 9th undergraduate semesters in medicine, in the second semester of 2016, in three medical schools in the region, were considered eligible. Students regularly enrolled in the selected periods were included and the exclusion criterion was the registration of recognized diseases that defined restrictive behaviors in relation to eating and physical activity.

The students were approached at their respective universities where they study, between classes. Students who were not present at the institution on the dates of data collection (on at least three

occasions, on different days and times) were considered as losses. For data collection, a self-administered questionnaire was used, built from validated research instruments, consisting of multiple-choice questions, aimed at identifying aspects related to the health of the student. The average response time for the questionnaire was 20 minutes.

The instruments used for data collection were: the international physical activity questionnaire - IPAQ¹⁵ and the Surveillance of risk and protective factors for chronic diseases questionnaire by telephone survey - VIGITEL¹⁶, from which questions on food consumption, smoking were extracted and used as well as alcohol consumption and questions concerning the demographic and social characterization of the sample. Additionally, the following instruments were also used: the Maslach Burnout Inventory-Student Survey (MBI-SS)¹⁷, which

assesses the three dimensions of Burnout Syndrome: emotional exhaustion, disbelief, and professional effectiveness; the General Health Questionnaire (GHQ-12), which assesses the presence of Common Mental Disorders¹⁸; the Beck Depression Inventory, validated for Portuguese¹⁹, and the Epworth daytime sleepiness scale²⁰.

The dependent variable in this study was clustering of risk behaviors, defined as the presence of three or more risk behaviors in the same individual. The following behaviors were evaluated: inadequate diet, smoking, alcohol abuse, and irregular practice of physical activity.

The presence of one or more of the following behaviors was considered inadequate: consumption of fruits and vegetables below that recommended by the World Health Organization (WHO), regular consumption of soft drinks, regular consumption of sweets, consumption of whole-fat milk, consumption of meat with excess fat, regular substitution of main meals for snacks, and inadequate consumption of salt. Regarding smoking, those who reported having the habit were considered smokers, regardless of frequency. Alcohol abuse was present in those individuals who reported having consumed 4 doses, in the case of women, or 5 doses, for men, of alcohol on a single occasion within the last 30 days. Physical inactivity was recorded for individuals classified as irregularly active or sedentary, according to IPAQ parameters¹⁵.

The independent variables were sex, age

group, marital status, type of institution, semester of the course, those whom they lived with at the time of data collection, daytime sleepiness, depressive symptoms, and dimensions of Burnout Syndrome. All variables were dichotomized. Regarding daytime sleepiness, pathological levels (excessive daytime sleepiness) were considered as scores above 10 (on a scale ranging from zero to 24); the presence of depressive symptoms was recorded for students classified as mild, moderate, and severe; and as for the Burnout dimensions, a score of four was used as a cutoff point, which corresponds to a regular frequency of the event.

The associations between demographic, socioeconomic and mental health variables, and clustering of CNCD risk behaviors were measured using the chi-squared test or Fisher's exact test. Binary logistic regression was performed to assess factors associated with clustering of risk behaviors. Binary logistic regression was used to estimate the odds ratio (OR) and their respective 95% confidence intervals (95%CI), and only the associated variables remained in the final model up to the level of 5% ($p \leq 0.05$), controlled by sex and age group. For all analyses, the IBM-SPSS statistical package (version 22.0) was used.

The study project was approved by the Research Ethics Committee of the institution where the study was conducted under opinion number 1.196.370/2015. All students who consented to participate signed the Informed Consent Form.

RESULTS

Questionnaires were collected from 209 medical students. Considering the total number of students in each semester, the participation rate was 94.0%, 57.6%, for the third and ninth periods, respectively. Most students participating in the study were female and enrolled in private institutions. The monthly family income of students had a median of R\$5,000.00 (P25 = 3,200.00; P75 = 10,000.00). Other sociodemographic characteristics of the students are available in Table 1.

Table 2 shows the CNCD risk behaviors recorded among students. Inadequate eating habits represented the main risk behavior, especially the inappropriate consumption of fruits and vegetables. Another very prevalent

risk behavior was sedentary lifestyle, present in 59.8% of respondents. Of the 209 students, 106 (50.7%) presented at least two risk behaviors and the association of three or more behaviors (clustering) was recorded for 46 students (22.0%).

To investigate the factors associated with clustering of CNCD risk factors, binary logistic regression analysis was used. Variables with significance up to 20% were included in the joint analysis (Table 3).

In the final model, the clustering of risk behaviors was greater in students with depressive symptoms (OR=2.22; CI=1.09-4.54) and with pathological levels of daytime sleepiness (OR=2.15; CI=1.07-4.30), controlled by the gender and age group variable.

Table 1 – Sociodemographic and mental health characteristics of medical students; Montes Claros (MG); 2016.

Variables	(n)	(%)
Sex		
Male	85	40.7
Female	124	59.3
Age Range**		
18 to 21 years old	102	49.0
Greater than or equal to 22 years old	106	51.0
Marital status		
Single/Divorced	191	91.4
Married/stable union	18	8.6
Type of Institution		
Public	48	23.0
Private	161	77.0
Course semester at data collection		
Third semester	141	67.5
Ninth semester	68	32.5
Who they currently reside with		
Alone	34	16.3
With their parents	71	34.0
With family members	42	20.1
With other students	52	24.9

Variables	(n)	(%)
Others	10	4.8
Common Mental Disorders (≥4)*		
Absent	69	33.3
Present	138	66.7
Depressive symptoms (≥10)		
Absent	137	65.6
Present	72	34.4
Emotional Exhaustion (≥4)**		
Low	114	54.8
High	94	45.2
Disbelief (≥4)**		
Low	173	83.2
High	35	16.8
Professional Effectiveness (<4)**		
High	155	74.5
Low	53	25.5
Daytime sleepiness (>10)		
Normal	138	66.0
Pathological	71	34.0

*n=207; **n=208

Table 2 – Risk behaviors for Chronic Noncommunicable Diseases among medical students; Montes Claros (MG); 2016.

Variables	(n)	(%)
Diet		
Inadequate consumption of fruits and vegetables	196	93.8
Regular consumption of soda	21	10.0
Regular consumption of sweets	53	25.4
Consumption of whole-fat milk	100	47.8
Consumption of meat with excess fat	71	34.0
Substituting main meals for snacks	28	13.4
Inappropriate consumption of salt	82	39.2
Other Behaviors		
Abusive consumption of alcoholic beverages	63	30.1
Smoking	17	8.1
Irregularly Active/Sedentary	125	59.8

Table 3 – Factors associated with the clustering of risk behaviors for Chronic Non-Communicable Diseases among medical students; Montes Claros (MG); 2016 (bivariate analysis).

Characteristics	Clustering of Risk Factors				p-value
	Yes		No		
	n	%	n	%	
Sex					
Male	21	24.7	64	75.3	0.436
Female	25	20.2	99	79.8	
Age group					
18 to 21 years old	24	23.5	78	76.5	0.630
≥ 22 years old	22	20.8	84	79.2	
Institution					
Public	6	12.5	42	87.5	0.070
Private	40	24.8	121	75.2	
Marital status					
With a partner	1	5.6	17	94.4	0.061
No partner	45	23.6	146	76.4	
Course semester					
Third	32	22.7	109	77.3	0.731
Ninth	14	20.6	54	79.4	
Monthly family income (in reais)					
					0.436

to be continued...

...continuation - Table 3

Characteristics	Clustering of Risk Factors				p-value
	Yes		No		
	n	%	n	%	
≥ 10,000.00	15	25.0	45	75.0	0.097
< 10,000.00	26	20.0	104	80.0	
Who they reside with					
Alone	11	32.4	23	67.6	0.097
Others	34	19.5	140	80.5	
Common Mental Disorders					
Absent	11	15.9	58	84.1	0.124
Present	35	25.4	103	74.6	
Depressive symptoms					
Absent	24	17.5	113	82.5	0.031
Present	22	30.6	50	69.4	
Emotional exhaustion					
Low	24	21.1	90	78.9	0.684
High	22	23.4	72	76.6	
Disbelief					
Low	33	19.1	140	80.9	0.019
High	13	37.1	22	62.9	
Professional Effectiveness					
High	29	18.7	126	81.3	0.043
Low	17	32.1	36	67.9	
Daytime sleepiness					
Normal	24	17.4	114	82.6	0.025
Pathological	22	31.0	49	69.0	

DISCUSSION

The results of this study highlight a worrying frequency of clustering of risk behaviors for chronic non-communicable diseases (CNCDs) among medical students. In principle, considering that this is a young population that works with health promotion on a daily basis, this result would not be expected.

During undergraduate studies, future

physicians acquire knowledge about CNCD risk and protective factors, as one of their responsibilities is to encourage population-oriented health promotion actions and provide guidance on disease prevention practices²¹. Although they acquire such knowledge, a significant portion of students do not adopt a healthy lifestyle. The observed result is particularly serious, considering that these students will be taken as role models in the health area for the general population. Currently, Brazil already reports increasing trends for most CNCD risk factors, which represent an enormous challenge for public health¹¹.

For the general population, the clustering of two or more CNCD risk behaviors was recorded in about two thirds of respondents, in a population-based study in the South of the country²². In another study, also in the South of Brazil, the prevalence of clustering of two and three or four behaviors were, respectively, 38.7% and 19.7%²³. Particularly for the adolescent population, other studies carried out with schoolchildren revealed that more than 60% of students had at least two CNCD risk factors^{24,25} and that about a fifth of this group accumulated four risk behaviors²⁶.

No other studies addressing the clustering of CNCD risk behaviors specifically among medical students in Brazil were identified. For university students in general, one study revealed that approximately a quarter of respondents had two or more CNCD risk behaviors²⁷. In another study, conducted with university students from different courses, these behaviors were a little more frequent, with reports of clustering of risk behaviors in 40.7% of students²⁸. However, both reported prevalences of two or more risk behaviors that were less than the present study. It is worth noting, however, that, in addition to having been carried out this study with students from different areas, the instruments used to assess behavior are different and the criteria adopted to classify

physical inactivity vary between studies.

The identified studies always record high percentages of risk factor clustering, but with different numbers, depending on the approach. In the present study, for example, any inappropriate eating behavior was assumed to have a single risk factor, while other studies address each of the different eating behaviors individually²²; or they only assess one eating behavior^{23,27}. A study with university students, for example, considered only the high consumption of fats as a risk factor²⁷. The study by Loch *et al.*²³, in turn, investigated only the irregular consumption of fruits and vegetables. Regardless of this aspect, inadequate food consumption and physical inactivity were the most prevalent risk behaviors among the identified studies^{22,26}, with the exception of the study by Paulitsch *et al.*²⁷, which had alcohol abuse as the most prevalent factor, and by Silva and Petroski²⁸, who reported more frequent alcohol abuse than physical inactivity. It is noteworthy, once again, that the instrument used to assess alcohol abuse presents substantial differences from the instrument used in herein and other studies.

Inadequate food consumption, with the high consumption of fats, sugar, and salt seems to be quite common among young people^{29,30} especially among university students^{4,28,31}. Low consumption of fruits and vegetables has also been pointed out as a common habit among Brazilians^{23,29} and also among students of other nationalities^{6,31}. It is common that, faced with a busy routine, many students opt for a more practical diet, with a quick preparation, and richer in fat, instead of healthier products.

Regarding physical activity, more than half of the students were classified as insufficiently active or sedentary. The lack of time to perform leisure activities due to an exhausting academic journey may be one of the main reasons for this result found. Other studies^{6,9,32} also registered a high number of

students who reported a practice of physical activity below what is recommended. Students from the medical course are less active when compared to students from other courses in the health area⁴. Support for the practice of physical activities is particularly relevant, as interventions that encourage the practice of physical activity help in the adoption of other healthier behaviors²⁸.

Smoking was the risk factor least reported by students. It is believed that this is seen as something more aggressive to health than eating habits and sedentary lifestyle, and it confirms the hypothesis that the clustering of these factors is more related to the students' routine than to the lack of knowledge about chronic diseases. Research that investigated the awareness of students concerning conditions relevant to metabolic syndromes showed that more than 80% of them correctly identified the symptoms and complications of various metabolic diseases²¹.

Regarding the analysis of factors associated with clustering of risk behaviors, the present study reported that students with excessive daytime sleepiness and depressive symptoms were 2.2 times more likely to present clustering of inappropriate behaviors that predispose them to the development of CNCDS. Students with such symptoms tend not to be concerned about their health, as apathy can be a depressive symptom. Although the number of hours dedicated to the study was not an investigated factor, it may also be one of the causes of the presence of excessive daytime sleepiness; and poor sleep quality was significantly associated with one or more metabolic syndrome criteria, in a study carried out in Korea³³. Sleep disorders also have a direct and well-known relationship with physical inactivity and alcohol consumption^{34,35}.

Other studies, carried out with university

students in general, identified that variables such as gender and study shift²⁸, self-perception of health, not eating breakfast, and maternal education²⁷ are associated with CNCDS risk behaviors. Factors such as sex, income, and school period were also associated with risk behaviors, in specific combinations²⁶. In the general population, it was observed that the increase in socioeconomic level reduced the probability of displaying the clustering of risk behaviors, and men were more likely than women to have such clustering²². These results highlight the particularities of medical students in relation to the accumulation of risk factors.

Medical students have a difficult and stressful routine, which justifies the greater probability of demonstrating a cluster of risk behaviors in those with excessive daytime sleepiness and depressive symptoms, aspects that only worsen the student's health. Regardless of gender, age, and other sociodemographic factors, all students are subject to the course's peculiar routine, and mental health aspects showed an important interference in the presence of clustering of risk behaviors.

In this article, some limitations must be considered. It was not possible to obtain participation from all students from the selected semesters. The non-random selection of students, even considering the proposal of a larger, longitudinal study, compromises the generalization of the data. Some variables related to the family were not measured and could help to understand the formation of inappropriate habits.

Despite these limitations, the relevance of the results observed in this study should be highlighted, as there are few studies carried out to assess the clustering of risk behaviors for chronic diseases among university students, and no studies specifically aimed at medical students were found.

CONCLUSION

There is a worrying prevalence of clustering of CNCSD risk behaviors among the evaluated students. Factors associated with such behaviors highlight the need for a greater surveillance of the routine and mental health aspects of medical students. Knowing that there are groups of students more susceptible to adopting these behaviors, it becomes more urgent for medical schools to discuss the creation of strategies aimed at

improving the health of their students.

The results also highlight the need to jointly investigate risk behaviors, in view of the high proportion of students who presented an accumulation of inappropriate behaviors. The university is an opportune setting for the development of health education actions and for the early assessment and identification of inappropriate behaviors that may be adopted by future professionals.

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