Original Article (short paper)

Behavioral health risk profiles of physical education undergraduates

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Abstract - Aim: To analyze the prevalence of risky behaviors among physical education undergraduates; to determine prevalence of risk factors for non-communicable chronic diseases (NCCD) among university, and; to determine the association between healthy life habits and physical activity. **Method:** A cross-sectional study with 903 undergraduate Physical Education students. The study used a self-administered questionnaire on health-related life habits. All questions were obtained from the Surveillance of Risk and Protection Factors for Chronic Diseases through Telephone Interviews. Logistic regression was used to estimate odds ratios (OR) and 95% confidence intervals (95% CI). **Results:** Of the 903 students, 57.4% were women, 67.6% were between 20-29 years of age, 68.7% consumed alcohol, 28.5% did not do physical activity, and 33.2% were overweight. Regarding the eating habits considered a risk for NCCD, women exhibited more risk factors than men, whereas 41.1% drank more full-fat milk ($p = 0.01$) and 31.8% ate more fatty meats, while men drank more soda ($p < 0.01$). Physically active students consumed more fruits ($p < 0.01$) and salads ($p = 0.01$) and drank less soda ($p < 0.01$). The physically inactive students had a high prevalence of getting diabetes ($p < 0.01$) and of suffering from hypertension ($p = 0.01$) and high cholesterol ($p < 0.01$). **Conclusions:** University students in our study had unhealthy lifestyles. There is an urgent need for both a formulation and implementation of public health policies to promote health and decrease risk factors for NCCD.

Keywords: risk factors; lifestyle; chronic diseases; students; physical education.

Introduction

In recent decades, lifestyle has been recognised as an important determinant of health status and has become a focus of increasing research interest worldwide. The World Health Organization (WHO) has stated that 60% of an individual's health-related quality of life depends on his/her Lifestyle[1]. Numerous publications[2-4] have shown that healthy lifestyle practices reduce disease occurrence and mortality rates and socio-demographic dimensions such as sex, age, marital status, economic level, and paid employment correlate with healthy Lifestyle[5].

Although it is difficult to change unhealthy habits that adults have adopted in their youth, many effects of health risk factors among adults are avoidable if these behaviours are identified and changed at an early stage[6,7].

University students represent a major segment of the young adult population[8]. When students reach high school or university, the rapid changes in biological, emotional, cognitive, and social development influence their behavior. At this stage, adolescents and young people are normally curious and experiment with a variety of things which supposedly form part of growing up. In different societies, lines are drawn at such behavior, these behaviors are unacceptable and are considered harmful to them and the society[9].

According to the collective imagination, healthcare students feature social responsibility regarding a healthy lifestyle[10]. Consequently, the practice of regular exercise and a balanced diet, in qualitative and quantitative terms, are viewed as an important factor in the promotion of health and quality of life[11,12].

In this sense, diet and physical activity are only two of the many factors associated with well-being, quality of life, longevity, lifestyle and other aspects of a broader concept called health[13].

In Brazil, studies involving university students of the physical education course are still scarce[14]. Therefore, it is critical to assess the at-risk behavior for non-communicable chronic diseases (NCCD) of these students in order to ensure short and long-term prevention and even intervention[15].

Studies show that, in general, university students do not have a healthy lifestyle and most exhibit three or more risk behaviors for diabetes, hypertension and cardiovascular disease[16]. Moreover, the risk factors for NCCD will most likely be added to the list[17].

However, it is believed that health students, specifically physical education students, the population of the present study,

present a positive profile of health behavior, since they are actively involved in habits considered healthy and spread the importance of this idea[13].

In addition, they will be professionals who will act as educators and motivators for the adoption of a healthy lifestyle by the population in general[14].

Therefore, this study examined the prevalence of risky behaviors among physical education undergraduates; to determine prevalence of risk factors for NCCD among university, and; to determine the association between healthy life habits and physical activity.

Methods

This cross-sectional study was conducted with undergraduate Physical Education students of a private institution in Brasilia (Midwest, Brazil).

The study population was composed of first to eighth-semester students who were in their classrooms on the day of data collection. A convenience sample consisted of 903 undergraduate students older than 18 years.

The number of participants was defined based on the guidelines on simple random sampling provided by Luiz and Magnanini[18]. The number of students per course was taken into consideration for sample size calculation. The maximum tolerable error rate was 5% and the 95% confidence levels were indicated. We assumed a 50% prevalence for the outcome. Thus, the final sample consisted of 903 undergraduate Physical Education students.

Instrument

We used a self-administered questionnaire on health-related life habits. All questions were obtained from the Surveillance of Risk and Protection Factors for Chronic Diseases through Telephone Interviews[19]. The questionnaire monitored the main risk and protective factors for non-communicable chronic diseases (NCCD) among adults older than age 18 and is applied on an annual and continuous basis in all Brazilian states and the Federal District[19].

The following demographic variables were included in the analysis: gender (male or female); age; socioeconomic level (based on the questionnaire of the ABEP-Brazilian Association of Research Companies)[20]; alcohol consumption (heavy drinking was defined as the consumption of five or more drinks in one sitting for men and four or more drinks in one sitting for women); smoking (yes/no); and health self-perception (excellent, very good, good, fair or poor), self-reported history of diseases, family history of hypertension, diabetes, high cholesterol, dyslipidemia and cardiovascular disease.

Specific questions were asked about the regularity and frequency of consumption of the following food items: fruit, greens/vegetables, and raw salad (on five or more days in a week-the recommended consumption frequency is five times a day or more, on five days a week or more); beans (on five or more days in a week); soft drinks (on five or more days in a week); full fat milk (on five or more days in a week); meat with excess fat (red meat with visible fat and/or chicken with skin).

Level of physical activity was classified as inactive (less than 150 minutes of moderate-intensity physical activity a week or less than 75 minutes of vigorous-intensity physical activity a week accumulated across work, home, transport or discretionary domains) or active (150 or more minutes of moderate-intensity physical activity a week). WHO[21] has recommended that adults aged 18-64 years should do at least 150 min of moderate-intensity physical activity per week.

Nutritional status was assessed by calculating body mass index (BMI) [weight in kilograms divided by the square of height in meters]. Self-reported weight and height, as well as cut-off points, were used in the calculation. Participants were classified as: underweight (< 18.5), normal weight (18.5-24.9), overweight (25-29.9) and obese (≥ 30)[22].

Concerning nutrition questions, non-communicable diseases protective factors were considered such as fruit and vegetables and beans consumption at least five or more times per week. Soft drinks consumption more than five times a week and the habit of consuming whole milk and meats with visible fats were considered as risk factors. A healthy life score was obtained, which was the sum of protective factors for NCCD, categorized from 1 to 5 points (low) and from 6 to 10 points (Moderate/High), where the greater the number of healthy habits referred by the participant, the more points the participant had.

Procedure

Data collection was performed between October 2016 and May 2017 by trained researchers. The instrument was administered during the break between lessons, in a classroom with a seating capacity for 60 students. Respondents had sufficient distance from each other to maintain confidentiality. The completed questionnaire was placed in an envelope containing the group name and the course session (morning and evening), and handed back to the researchers.

Before distributing the instrument for self-completion and the informed consent form for signing, the researchers briefly introduced themselves and explained the aims and methods of the study to the professor in charge of that particular class. Next, the researchers introduced themselves and the study project to the students and invited them to participate.

This study was approved by the Research Ethics Committee of the Centro Universitário do Distrito Federal-UDF (CAAE: 59713316.0.0000.5650 / protocol number 1.794.275).

Statistical analysis

Data are presented as absolute and relative frequencies and displayed with their respective 95% confidence intervals. The association between risk factors and sex and PA were analyzed using chi-square tests.

Odds ratio was calculated using logistic regression models to analyze if gender, age, and socioeconomic level are (moderate/high) healthy life score predictors. Crude and adjusted models were used in the assessment (for all variables together).

Multiple correspondence analysis was conducted to test the joint relationship between risk factors for NCCD, gender, physical activity, and nutritional status. All statistical analyses were performed using the SAS Software, version 9.2, while correspondence analysis was conducted using SPSS, version 2.1. The level of significance was set at 5%.

Results

A total of 903 students (who were 18 or older) out of the total of 1208 students enrolled in the program during the academic year of 2016 were included in the study. The loss of 305 students representing 25% of the population is because students did not attend the university on the day of data collection. A second attempt to include the students that missed the first day of data collection was made during another day. If the student missed both opportunities, he/she was not included in the study.

Of the studied population, 57.4% were women, 42.6% were men and most of the students, 67.6%, were aged between 20 and 29. Moreover, 57% of the university students were in the C social-economic class and 39.5% stated their health was "good".

Table 1 describes the sample according to demographic, socioeconomic and health-related characteristics. In terms of habits, 68.7% of the students consumed alcoholic beverages, 28.5% did not exercise more than 150 min/week and 33.2% were overweight.

Table 2 shows the prevalence estimates for risk and protective factors for NCCD in the total population and according to gender, respectively. It was noted that 80.7% had a moderate/high health score (6 to 10 points). In relation to alcohol and tobacco use, the men drank and smoked more than the women, showing a statistical difference in tobacco use ($p < 0.01$).

With regard to eating habits, the consumption of salad ($p = 0.04$), vegetables/legumes and beans was more prevalent among men, while the consumption of fruit was more prevalent among women.

In terms of dietary behaviors considered at risk for NCCD, the women exhibited more risk factors than the men. Of this population, 41.1% had a higher prevalence of consuming full-fat milk ($p < 0.01$) and eating fatty means (31.8%), although it was noted with a significant difference ($p < 0.01$) that the men drank more soda (25.7%).

A high prevalence of physically inactive students was also noted. Of these students, the women (34.3%) were more physically inactive ($p < 0.01$) and 4.2% were classified as obese.

Concerning self-referred diseases, a significant difference was observed in terms of gender in relation to high cholesterol, with a high prevalence among women (17.3%, $p = 0.02$). Women also showed a high prevalence of hypertension, diabetes mellitus and dyslipidemia, without significant differences.

The studied group is a population at imminent risk for NCCD, in which the men had a higher prevalence for tobacco and alcohol use and a significant number of students had high cholesterol levels and exhibited unhealthy behaviors.

Table 3 shows the association between physical activity (> 150 min/week) and protective and risk factors for NCCD, in addition to self-referred diseases among the students. The students who did physical activity according to recommendations (> 150 min/week) consumed more fruit ($p < 0.01$), salad ($p = 0.01$) and drank less soda ($p < 0.01$).

An analysis of the association between physical inactivity and self-referred diseases revealed a high prevalence of diabetes mellitus ($p < 0.01$), hypertension ($p = 0.01$) and high cholesterol ($p < 0.01$) among the students who did not exercise.

Table 1 - Description of the sample according to students's characteristics. Brasília, DF, Brazil, 2017.

Variable	N	%
Sex		
Female	518	57.4
Male	385	42.6
Age (years)		
≤ 19	143	15.8
20-29	610	67.6
≥ 30	150	16.6
Socioeconomic level		
A	23	2.6
B	230	25.5
C	515	57.0
D	135	15.0
Self-perception of health		
Excellent	153	16.9
Very good	262	29.0
Good	357	39.5
Fair	109	12.1
Poor	22	2.4
Smoking		
Yes	263	29.1
No	640	70.9
Use of alcohol		
Yes	621	68.7
No	282	31.2
Nutritional status		
Underweight	40	4.4
Normal weight	531	58.8
Overweight	300	33.2
Obese	32	3.5
PA >150 min/week		
Yes	646	71.5
No	257	28.5
Total	**903**	**100**

Table 2 - Prevalence of risk factors for NCCD among university, overall and according to sex. Brasília, DF, Brazil, 2017.

	Total			Female			Male			
Variables	**N**	**%**	**95% CI**	**N**	**%**	**95% CI**	**N**	**%**	**95% CI**	**p-value**
Protective factors										
Consumption on five or more days per week										
Fruit consumption (≥ 5 times/week)	467	51.7	48.4-54.9	273	52.7	48.4-57.0	194	50.3	45.4-55.3	0.49
Raw salad consumption (≥ 5 times/week)	379	41.9	38.7-45.1	203	39.1	34.9-43.3	176	45.7	40.7-50.6	0.04*
Greens or vegetables consumption (≥ 5 times/week)	459	50.8	47.5-54.0	261	50.3	46.0-54.7	198	51.4	46.4-56.4	0.76
Beans consumption (≥ 5 times/week)	658	72.8	69.9-75.7	368	71.0	67.1-74.9	290	75.3	71.0-79.6	0.15
Risk factors										
Soft drinks consumption (≥ 5 times/week)	151	16.7	14.2-19.1	52	10.0	7.4-12.6	99	25.7	21.3-30.0	<0.01*
Habitual intake of full-fat milk	334	36.9	33.8-40.1	213	41.1	36.8-45.3	121	31.4	26.7-36.0	<0.01*
Habitual intake of meat with visible fat	281	31.1	28.1-34.1	165	31.8	27.8-35.8	116	30.1	25.5-34.7	0.58
Physically inactive (<150 min of PA per week)	257	28.4	25.5-31.4	178	34.3	30.2-38.4	79	20.5	16.4-24.5	<0.01*
Smoking	263	29.1	26.1-32.0	129	24.9	21.1-28.6	134	34.8	30.0-39.5	<0.01*
Use of alcohol	621	68.7	65.7-71.7	344	66.4	62.3-70.4	277	71.9	67.4-76.4	0.08
Overweight (BMI ≥ 25 and <30 kg/m^2)	300	33.2	30.1-36.2	162	31.2	27.2-35.2	138	35.8	31.0-40.6	0.19
Obesity (BMI ≥ 30 kg/m^2)	32	3.5	2.3-4.7	22	4.2	2.5-5.9	10	2.6	1.0-4.1	0.45
Self-reported diseases										
Arterial hypertension	28	3.1	1.9-4.2	17	3.2	1.7-4.8	11	2.8	1.2-4.5	0.72
Diabetes mellitus	43	4.7	3.3-6.1	29	5.6	3.6-7.5	14	3.6	1.7-5.5	0.17
High cholesterol levels	136	15.0	12.7-17.3	90	17.3	14.1-20.6	46	11.9	8.7-15.1	0.02*
Dyslipidemia	20	2.2	1.2-3.1	12	2.3	1.0-3.6	8	2.0	0.6-3.5	0.81
Health life score										
Low	174	19.2	16.7-21.8	103	19.8	16.4-23.3	71	18.4	14.5-22.3	0.59
Moderate/High	729	80.7	78.1-83.3	415	80.1	76.6-83.5	314	81.5	77.6-85.4	

*Chi-square test.

Table 3 - Association between healthy life habits and physical activity in undergraduate students.

Variables	PA >150 min/weeks						p-value
	No (n=257)			Yes (n=646)			
	N	%	95% CI	N	%	95% CI	
Nutritional status							
Underweight	14	5.4	2.6-8.2	26	4.0	2.5-5.5	
Normal weight	144	56.0	49.9-62.1	387	59.9	56.1-63.6	0.57
Overweight	91	35.4	29.5-41.2	209	32.3	28.7-35.9	
Obese	8	3.1	0.9-5.2	24	3.7	2.2-5.1	
Alcohol consumption							
No	84	32.6	26.9-38.4	198	30.6	27.0-34.2	0.55
Yes	173	67.3	61.5-73.0	448	69.3	65.7-72.9	
Smoking							
No	180	70.0	64.4-75.6	460	71.2	67.7-74.7	0.73
Yes	77	29.9	24.3-35.5	186	28.7	25.3-32.2	
Consumption of fruit (≥ 5 times/week)							
No	152	59.1	53.1-65.1	284	43.9	40.1-47.7	<0.01*
Yes	105	40.8	34.8-46.8	362	56.0	52.2-59.8	
Consumption of salad (≥ 5 times/week)							
No	166	64.5	58.7-70.4	358	55.4	51.5-59.2	0.01*
Yes	91	35.4	29.5-41.2	288	44.5	40.7-48.4	
Consumption of greens (≥ 5 times/week)							
No	138	53.7	47.6-59.8	306	47.3	43.5-51.2	0.09
Yes	119	46.3	40.2-52.4	340	52.6	48.7-56.4	
Consumption of beans (≥ 5 times/week)							
No	74	28.7	23.2-34.3	171	26.4	23.0-29.8	0.48
Yes	183	71.2	65.6-76.7	475	73.5	70.1-76.9	
Consumption of soft drinks (≥ 5 times/week)							
No	237	92.2	88.9-95.4	515	79.7	76.6-82.8	<0.01*
Yes	20	7.7	4.5-11.0	131	20.2	17.1-23.3	
Consumption of full fat milk							
No	162	63.0	57.1-68.9	407	63	59.2-66.7	0.99
Yes	95	36.9	31.0-42.8	239	37	33.2-40.7	
Consumption of meat with visible fat							
No	169	65.7	59.9-71.5	453	70.1	66.5-73.6	0.20
Yes	88	34.2	28.4-40.0	193	29.8	26.3-33.4	
Arterial hypertension							
No	243	94.5	91.7-97.3	632	97.8	96.7-98.9	0.01*
Yes	14	5.4	2.6-8.2	14	2.1	1.0-3.2	
Diabetes mellitus							
No	233	90.6	87.1-94.2	627	97.0	95.7-98.3	<0.01*
Yes	24	9.3	5.7-12.9	19	2.9	1.6-4.2	
High cholesterol levels							
No	197	76.6	71.4-81.8	570	88.2	85.7-90.7	<0.01*
Yes	60	23.3	18.1-28.5	76	11.7	9.2-14.2	
Dyslipidemia							
No	253	98.4	96.9-99.9	630	97.5	96.3-98.7	0.40
Yes	4	1.5	0.0-3.0	16	2.4	1.2-3.6	

*Chi-square test.

No association was found between the healthy living score (low vs. moderate/high) and gender, age and socioeconomic status (Table 4).

Table 5 shows that the variables gender, age and socioeconomic status are associated with a healthy living score, but no relationship between the healthy life score and these variables was detected.

Figure 1 shows the relationship between the NCCD risk factors, gender, physical activity, and nutritional status, by using multiple correspondence analyses.

The graph indicates that participants with high cholesterol tend to also have hypertension and dyslipidemia. The proximity of the data in the chart indicates an association and it was noted that the obese students tended to have high blood pressure and cholesterol and dyslipidemia.

As for the remaining factors, it was not possible to identify a defined profile since the points are very close to the origin. The low percentage of explanations may be caused by a large number of analyzed variables.

Table 4 - Association between health life score and sex, age and socioeconomic level.

Variable	Healthy Life Score		p-value
	Low (n = 174)	Moderate/high (n=729)	
Sex			
Female	103 (59.2%)	415 (56.9%)	0.59
Male	71 (40.8%)	314 (43.0%)	
Age (years)			
≤ 19	23 (13.2%)	120 (16.4%)	
20-29	123 (70.6%)	487 (66.8%)	0.53
≥ 30	28 (16.0%)	122 (16.7%)	
Socioeconomic level			
A	4 (2.3%)	19 (2.6%)	
B	49 (28.1%)	181 (24.8%)	
C	91 (52.3%)	424 (58.1%)	0.52
D	30 (17.2%)	105 (14.4%)	

Chi-square test.

Discussion

Risky behaviors can significantly affect the lives of the youth and those around them. Parents, educators, and other concerned adults must become aware of the prevalence of these behaviors and plan programs that can reduce or prevent them[23].

This study revealed important aspects regarding the health of Brazilian university students. The sociodemographic profile was composed mostly of women, between 20 and 29 years of age, with a low family income (3 to 5 minimum wages-class C). Regarding self-referred diseases, 15% claimed they had high cholesterol. It was noted that 80.7% had a moderate/high health score (6 to 10 points).

Another relevant factor in this study is the importance of studying physical education students since their work will be related to preventing diseases and promoting health. Therefore, in the academic setting, it is believed they should be prepared to work with preventive actions.

With respect to the sample group, most of the subjects were women, which could be justified by the higher percentage of women in health-related courses. In accordance with the results of this study, a previous study[24] on alcohol use found that most of the subjects were men (61.6%) and only 38.4% were women, as also found in several other works on alcohol use, thus corroborating other findings[25].

Although many antismoking campaigns are promoted by the Ministry of Health in Brazil, initiation into smoking chiefly happens during adolescence[26]. A study conducted with adolescents and adults from Belo Horizonte found that 51% of participants were smokers[27]. In Colombia, a study revealed that 80% of nursing undergraduates are smokers[28]. This is a significantly higher percentage than the one found in this study (29.1%). This difference may be explained by the social and cultural characteristics of the region where the study was conducted. Several studies in Brazil and globally, have shown the higher smoking prevalence among men than women[28]. The gender differences in smoking prevalence may be explained by cultural and religious

Table 5 - Predictive factors of moderate/high healthy life score.

Likelihood modeled in Score='moderate/high								
Effect	Crude odds ratio	95% CI		p-value	Adjusted odds ratio	95% CI		p-value
Sex (male vs female)	1.10	0.78	1.54	0.59	1.13	0.80	1.58	0.49
Age (20-29 vs ≤ 19)	0.76	0.47	1.24	0.56	0.75	0.46	1.23	0.26
Age (>30 vs ≤ 19)	0.84	0.46	1.53	0.27	0.83	0.45	1.52	0.54
Socioeconomic level (A vs D)	1.36	0.43	4.30	0.60	1.38	0.43	4.37	0.59
Socioeconomic level (B vs D)	1.06	0.63	1.77	0.84	1.07	0.64	1.78	0.81
Socioeconomic level (C vs D)	1.33	0.83	2.19	0.23	1.35	0.85	2.16	0.20

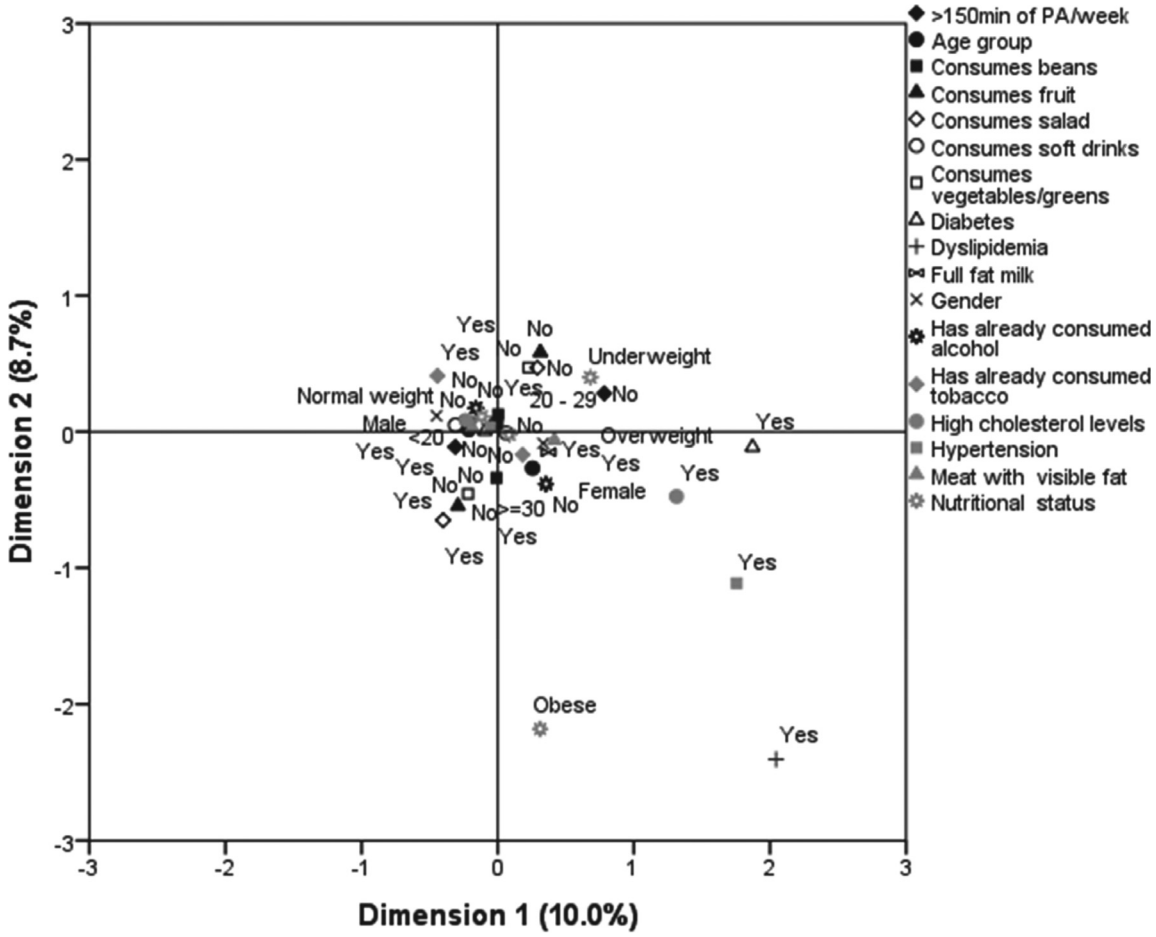

Figure 1 - Joint relationship between risk factors, sex, physical activity and nutritional status of university students.

factors. Tobacco was originally introduced among men and has been associated with a symbol of masculinity and power[28].

Our study showed a prevalence of alcohol consumption and tobacco use among Physical Education undergraduates of 68.7% and 29.1%, respectively[29]. This is rather a worrying result since alcohol and tobacco use is associated with several behavioral disorders and health problems.

The highest percentages were recorded in the age group 20 to 29 years. Similar results were found in another study, which also identified an association between the casual use of alcohol and the use of psychoactive drugs[25].

In this study, the prevalence of alcohol consumption was higher (68.7%) than in British students (25-42%)[30], medical students from public and private universities in the USA (6-12%)[31] and medical students in Crete, Greece (3.6%)[32].

A national survey on the consumption of alcohol among university students that was

performed in Brazil in 2010 found revealed that 86.2% of respondents had used alcohol at least once in their lives[26]. When comparing the results of the aforementioned survey with the First National Survey on the Patterns of Alcohol Consumption in the Brazilian Population in 2007, we found that 52% of people older than 18 years had consumed alcohol at least once in the previous 12 months, whereas 48% were abstinent[26].

The majority of our sample (56.7%) was within a normal weight. This agrees with the results of other studies[15], in which normal weight was also more prevalent among university students.

These risk factors are complemented by the anthropometric profile. Men showed a higher prevalence of overweight, whereas women demonstrated a higher prevalence of obesity.

This was also found by Gasparotto, Gasparotto, Salles, Campos[33], who investigated risk factors for the development of cardiovascular diseases in 1,600 university students and found a higher incidence of overweight in men (32%) than in women (20%). Petrib, Cabral, Arruda[34] corroborate conducted a study with 250 university students in Recife, Brazil. Their findings corroborate other studies in which the prevalence of overweight among women was significantly lower than that of men (5.3% and 35.5%, respectively).

Peltzer and Pengpid[35] assessed nutritional status and associated factors in 15,068 university students from 21 underdeveloped and developing countries and found a prevalence of overweight and obesity of 61.1% (41% in men and 25.1% in women) and 27%, respectively. In India, studies indicate a prevalence of overweight in men and women of 37.5 and 26.8%, respectively[36].

Costa e Vasconcelos[37] assessed the body weight of 220 female freshmen students of a university in Florianópolis, SC,

Brazil, and found that 72.3% of them were normal weight, 11.8% were overweight and 3.2% were obese. This disagrees with the results of previous studies, which show a low prevalence of consumption of fruit and vegetables (less than five days a week) among undergraduate health students (44%)[38].

A 10-year-study monitored health indicators and quality of life of 1,232 university students in Bahia, Brazil, and found an insufficient consumption of fruit and vegetables by 81.2% and 57% of participants, respectively[39].

The Surveillance of Risk and Protection Factors for Chronic Diseases through Telephone Interviews[19] evidenced that Brazilians do not regularly consume fruit and vegetables. Moreover, between-sex comparison demonstrated that men (17.6%) consume less than women (39.2% versus 49.8%).

The marked prevalence of high full-fat milk consumption by women (41.1%) is worrisome, as this habit is associated with the global risk of cardiovascular diseases, such as coronary heart disease and stroke[16]. The habit of consuming fatty meat was not assessed in other studies conducted with university students. In this study, the women had a high prevalence of consuming fatty mean (31.8%). The high intake of saturated fats and cholesterol-rich foods due to the habit of consuming animal fat increases the risk of coronary heart disease, ischemic stroke, and other cardiovascular diseases. This diet habit is also considered a risk factor for the development of dyslipidemias[40]. These facts highlight the need to investigate the excessive consumption of animal fat and increase awareness of university students regarding the consequences of this habit.

Another important health-risk behavior is the low level of physical activity among students, and the women showed even lower levels. In a study conducted with students at a university in the State of Santa Catarina, southern Brazil, the women were more sedentary than the men, and 17.4% of them were inactive[32]. This physical inactivity can be explained by the fact that women have more activities besides university duties, such as taking care of their children, domestic work, and also economic issues, thus providing less time to practice physical activity.

These data corroborate[41] a higher level of physical inactivity among women. There are studies in the literature that show that age modifies the practice of physical activity with a greater decline among young people from 18 to 25 years old, which is related to the transition to higher education[42].

The prevalence of physical inactivity was higher in women, corroborated by a study where the prevalence was higher in women with dependents at home (children and/or sick people), related to the historical roles of wife, mother and caregiver held by women[41]. This also corroborates the findings of another study, in which the high presence of children at home made it difficult to practice physical activity when there were no caretakers to leave their children with[43]. Another study showed that family obligations and income were associated with physical inactivity in the entire population (45.4%) and, for women, such obligations were statistically significant[44].

The researchers highlight that females have 1.7 times greater chance of physical inactivity when compared with men[42], this finding is consistent with previous study reported in the literature[43].

Several factors are mentioned in the literature as the main reason for the absence or abandonment of the practice of physical activity. Research conducted with students from the University of Mansoura (Egypt) shows that lack of time and motivation, few safe places to practice sports and lack of incentives are the most reported causes for physical inactivity in this population[45]. Lack of time, however, is the main reason why college students, especially women, stop doing physical activity.

For Mielke, Ramis, Habeyche, Oliz, Tessmer, Azevedo, Hallal[46], the sex differences are related to preference, while men adhere to sports and group activities (soccer, volleyball, basketball), women prefer individual activities (swimming, walking, cycling). The reason for this difference in adherence to physical activity between genders can also be explained due to motivational factors, as men are more intrinsically motivated and seek for challenges and fun while women are more extrinsically motivated and aim to improve their appearance, weight maintenance, and health care[47].

The predominance of class C individuals in this study may also have contributed to the increased prevalence of physical inactivity among students. In a study that evaluated the association between physical inactivity and socioeconomic status, the highest prevalence of physical inactivity was also found in people of classes C and D[48]. A possible explanation for this behavior is the lack of time since the type of work in these social classes is demanding and takes up a great deal of time, while the lack of suitable public places for practicing physical activity may also contribute to this high prevalence[49].

Previous studies indicate that university students are becoming increasingly inactive and that healthcare undergraduates tend to engage in less physical activity than their peers[50].

Florindo, Brownson, Mielke, Gomes, Parra, Siqueira[51] demonstrated an association between the level of physical activity (PA) and fruit and vegetable consumption among university students. Pinho et al.[52], however, did not find such associations. This study showed a significant association between physical inactivity and lower consumption of fruits and vegetables. This fact corroborates the possible existence of concomitant behaviors that favor the occurrence of NCD[53]. In this study, such behaviors are a diet poor in fruit and vegetables and physical inactivity.

Gasparotto el at.[33] found that about 55% of undergraduate students in the fields of Biological and Exact sciences and Humanities undertook less than 150 minutes of physical activity per week. This evidences that only a little less than half of the sample meets the recommended levels of physical activity. In this study, a between-sex comparison demonstrated that women (34.3%) were more sedentary than men ($p < 0.01$).

Since university students, especially in the fields of health sciences, will become opinion-makers in their professions and since they are considered multipliers of a healthy lifestyle, the effects of the health-related behavior of physical education students on their future practice are hereby questioned. We observed that inactive students presented more morbidities and inadequate eating habits, these factors can be explained by the fact that physical inactivity provides a high prevalence of chro-

nic diseases, as well as the appearance of metabolic and physiological alterations, such as obesity and diabetes.

It is noticeable that the risk factors tend to cluster in the student population. A study conducted with university students showed that 86% exhibited three or more risk factors[54].

The present study has some limitations. Firstly, the sectional design does not allow the establishment of a time relationship between the variables of interest in this research. Secondly, although risk factors for NCCD were assessed with a standardized and validated questionnaire, the use of self-reporting methods to collect data might have caused some errors in estimation. Thirdly, the study sample included a much higher number of females than males.

Identifying the population groups that are most exposed to risk factors and behaviors for NCCD (such as sedentary lifestyle) is critical for the design and implementation of actions aimed at reducing their incidence.

Conclusions

This study revealed that the participants had several NCCD risk factors, that is, a high prevalence of alcohol use, physical inactivity, the consumption of meat and full-fat milk and the low consumption of salads.

In comparison to women, men consumed more alcohol and soda and less fruit. It should be noted that women had a greater number of self-referred diseases, particularly high cholesterol.

Encouraging a healthy lifestyle is a challenge for todays health workers, managers, and public and private authorities. With the recent public policies geared toward promoting health in Brazil, considerable advancements have been made in this area, as shown in the evolution of population survey data.

Thus, the data from this study can contribute to the creation and development of projects in higher education institutions aiming to encourage a healthier lifestyle.

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Manuscript received on July 25, 2019

Manuscript accepted on September 28, 2019