

Excess weight in nursing junior and senior undergraduate students

Excesso de peso em universitários ingressantes e concluintes de um curso de enfermagem

Sobrepeso en universitarios ingresantes y concluyentes de un curso de enfermería

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ABSTRACT

Objective: Compare excess weight in undergraduate nursing junior and senior students. **Methods:** A cross sectional study was developed with a sample of 91 junior students and 63 senior students. In bivariate analysis, Pearson Chi-square and/or Fischer's Exact tests were applied. For ordinal variables, the chi-square test for linear trend was used. Differences between groups were also verified by using odds ratio. A statistical significance level of 5% was used. **Results:** Mean age was 22.4 years, and the group was predominantly made up of women, single, in stable relationships, black and with family income of 3 to 5 minimum wages. A high prevalence of high waist circumference and high to very high risk for waist-hip ratio was observed among the groups, as well as excess weight for junior (30.8%) and for seniors (30.2%). **Conclusion:** The groups were similar in relation to the researched variables. There is a need for encouraging students to adopt healthy habits, mainly eating habits and physical activity, as well as investigating the association of these results with other changeable risk factors.

Keywords: Nursing Students; Nursing; Obesity.

RESUMO

Objetivo: Comparar o excesso de peso entre estudantes de graduação em enfermagem ingressantes e concluintes do curso. **Métodos:** Trata-se de estudo de corte transversal, com uma amostra de 91 ingressantes e 63 concluintes. Nas análises bivariadas, aplicou-se os Testes Qui-quadrado de Pearson e/ou Exato de Fischer. Para variáveis do tipo ordinal, aplicou-se o Teste Qui Quadrado de Tendência Linear. As diferenças entre os grupos foram também verificadas pela *Odds ratio*. Adotou-se o nível de significância estatística de 5%. **Resultados:** A média de idade foi de 22,4 anos, sendo o grupo caracterizado, predominantemente, pelo sexo feminino, solteiras(os), com parceiras(os) fixos, raça negra e renda familiar de 3 a 5 salários mínimos. Constatou-se alta prevalência entre os grupos quanto a circunferência da cintura elevada e ao risco alto a muito alto para a razão cintura-quadril, bem como para excesso de peso em ingressantes (30,8%) e concluintes (30,2%). **Conclusão:** Os grupos foram semelhantes quanto as variáveis estudadas. Há necessidade de se incentivar a adoção de hábitos saudáveis junto aos estudantes, sobretudo relacionados à alimentação e à prática de atividade física, bem como de se investigar a associação desses resultados com outros fatores de risco cardiovascular de natureza modificável.

Palavras-chave: Estudantes de Enfermagem; Enfermagem; Obesidade.

RESUMEN

Objetivo: Comparar el sobrepeso entre estudiantes de graduación en enfermería ingresantes y concluyentes del curso. **Métodos:** Estudio de corte transversal, realizado con 91 ingresantes y 63 concluyentes. En el análisis bivariado se aplicó los testes Chi-cuadrado de Pearson y/o Exacto de Fisher. Para las variables del tipo ordinal, el Teste Chi-Cuadrado de Tendencia Linear. Las diferencias fueron también verificadas por OR (odds ratio). Se adoptó el nivel de significancia estadística de 5%. **Resultados:** El promedio de edad fue de 22,4 años, mayoría femenina, solteros con pareja estable, raza negra y renta familiar de 3 a 5 salarios mínimos. Alta prevalencia entre los grupos cuanto a la circunferencia de la cintura elevada y al alto a muy alto riesgo para la relación cintura-cadera, sobrepeso para ingresantes (30,8%) y concluyentes (30,2%). **Conclusión:** Se necesita incentivar la adopción de hábitos saludables e investigar la asociación con factores de riesgo cardiovascular de naturaleza modificable.

Palabras clave: Estudiantes de Enfermería; Enfermería; Obesidad.

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INTRODUCTION

Lifestyle changes have contributed to increase obesity prevalence in all age groups and social classes, turning it into a worldwide epidemic and a relevant public health problem. More than 17% of children and 30% of adults worldwide are considered obese¹.

Around 65% of the world population live in high and middle-income countries, where obesity and overweight kill more than low weight². In 2014, the Brazilian Monitoring System of Risk and Protective Factors for Chronic Diseases by Telephone Survey³ found that 52.5% of the Brazilian population were overweight and 17.9% were obese. In terms of gender, 56.5% of men and 49.1% of women had body mass index ≥ 25 mg/kg. The segment with an index of ≥ 30 mg/kg was made up of 17.6% men and 18.2% women. In Salvador, the percentage of overweight adults was 52% and obese adults 18%³. The latest survey conducted with information from DATASUS showed that more than half of Brazilian adults was overweight and at least 17% of the population was obese³.

Observational studies showed that excessive weight and increase in waist circumference are predictive factors for arterial hypertension, with central obesity being an important cardiovascular risk factor. The studies emphasize that central obesity is more strongly associated with elevated levels of arterial pressure than total adiposity. Moreover, waist-hip ratio reflects the disproportion of intra-abdominal fat and demonstrates increased risk for arteriosclerosis, arterial hypertension, acute myocardial infarction and sudden death^{1,2}.

The World Health Organization established the goal of reducing cardiovascular diseases in 25% until 2025 through the identification of risk factors and preventive programs in a variety of population groups², recommending excess weight prevention and early identification of this risk factor, aiming to establish interventions that can delay or stop the emergence of cardiovascular events and resulting disabilities and reduce costs for the public health system⁴⁻⁶.

Excess weight must be avoided at all phases of the human development cycle, making it important to emphasize the importance of its early detection, since it is one of the main risk factors for noncommunicable chronic diseases, in addition to being associated with increased risk of obesity in adult life and premature death¹.

It is crucial to know patterns and trends of excess weight risk factors among young people, including undergraduate students. It is during this phase that personality and habits are solidified. College life makes it possible to create new relationships, with the possibility of adopting sedentary behaviors and an inadequate diet, favoring weight gain. This may be related to lack of time, motivation and social support, distance between home and places for practicing exercise, in addition to lack of spare time for the preparation of healthy food, with the possibility of substituting meals for snacks rich in salt, calories, fried foods and condiments. Especially during college education, students describe having less time to adopt healthy habits because of their academic

obligations. Accumulation of curricular and extracurricular activities during college, such as internships, research groups, extension and scientific initiation projects, can compromise the time they have available for practicing regular physical activities and can favor sedentary behaviors⁷.

A literature survey on obesity among undergraduate nursing students was conducted in the Virtual Health Library database and in the Scientific Journals Library of the Coordination for the Improvement of Higher Education Personnel, using the following keywords: students; graduation; obesity; and overweight. In the last 10 years, there was a scarcity of literature on excess weight among undergraduate students, especially focusing on nursing students, as well as on the difference in exposure to this risk factor among junior and seniors. Therefore, the objective of this study was to compare excess weight among junior and seniors in an undergraduate nursing course.

METHODS

This is a cross-sectional study conducted at the school of nursing of a public federal university in Salvador, in the state of Bahia. The convenience sample was made up of 154 nursing students, namely 91 junior and 63 seniors. Inclusion criteria were students enrolled and attending the first two or the last two semesters of the nursing undergraduate course, with minimum age of 18 and of both genders. The exclusion criterion was having a physical limitation for measuring anthropometric characteristics.

Two instruments were employed for data collection; one of them with closed, semi-structured questions to gather sociodemographic data, one for recording anthropometric measurements (weight, height, waist and hip circumferences), body mass index (BMI) values and waist-hip ratio (WHP).

Students were approached in class, at times that were previously scheduled with the collegiate. At the due date, researchers were introduced, the importance of the research was stated and objectives, benefits and procedure risks in the study were explained. Students who accepted to participate in the study read and signed a free and informed consent form.

After acceptance, a date that was favorable for the students was set in order to apply the data collection instruments. At due date, they were welcomed at their designated locations and times. The study was approved by the Research Ethics Committee of UFBA, under Protocol Nr. 024/2010, and based on ethical aspects regulated by Resolution Nr 196, October 10, 1996 of the National Health Council. Personal identity discretion, the right to abandon the study and privacy were respected.

The instrument for sociodemographic characterization was self-administered⁸. A private university nurse that was properly trained conducted anthropometric measurements in a private room at the school. Students wore clothes made of light, disposable, nonwoven fabric and took off their shoes and accessories, such as hairpins, glasses, watches, bracelets, rings and necklaces. Weight was measured in kilos with a digital scale, model TEC 30, made by Techline and tested by the National Institute of Metrology (Inmetro), with a variation of 0.1 kg and maximum

capacity of 150 kg and minimum of 2.5 kg. Height was measured in meters with a wooden ruler in a portable stadiometer made by Altirexata, inserted in a base, graded at 0.5 cm intervals⁹.

For weight measurements, students stood up facing the scale's display, with arms parallel to their bodies and eyes fixed at the horizon. After weight measurement, they remained standing up for height measurement, with heads and backs touching the stadiometer ruler, under the horizontal bar, keeping their arms stretched in parallel to their bodies, with shoulders, shoulder blades, buttocks and heels touching the wall and feet on the ground. Afterwards, they were asked to look forward, take deep breaths and hold in the air. Measurements were made in meters^{9,10}. These two measurements were used to calculate BMI, dividing weight in kilos by height multiplied to the 2nd power in m^2 .

To determine waist circumference (WC), students stood up, breathed normally with arms beside their bodies and feet close together in an erect position, with backs turned to a horizontal mirror 1.20 cm wide and 1 meter high. The measuring point was established at the medium point between the lower part of the back arch and the iliac crest at the right side. The examiner stood in front of the students, passed the metric tape at the height of the waist, on the marked point, which was in the middle point between the lower back arch and the iliac crest on the right side, and checked on the mirror if the tape was horizontal; when finding the reference points on the right side, they were marked with dermatographic pencils. Measurements were done while students breathed normally, with relaxed abdomens, and readings were done during normal expiration. Exact data were recorded, with no rounding. At the end of the procedure, the points were erased with cotton balls soaked in 70% alcohol^{9,10}.

International Diabetes Federation's (IDF) parameters for assessment and classification of WC were used. They propose a cut-off point that is different for each ethnicity. For measuring hip circumference, examiners sat in front of participants and measured them with the metric tape going around the maximum protrusion of the hip muscles. The waist-hip ratio was calculated dividing waist circumference (cm) by hip circumference (cm). Parameters for classification of waist-hip ratio were chosen according to gender and age¹⁰. Values for the central and south American groups (< 90 for men and < 80 for women) were adopted as reference for normality. At the end of gathering procedures, students were thanked for their participation.

Data were codified and typed into SPSS, version 18.0. After these procedures, they were exported to statistical software STATA v.12 for data treatment and analysis. Descriptive analyses were conducted using absolute (n), relative (%), uni- and bivariate frequency distributions, means and standard deviations. To assess the magnitude of associations between variables of interest, Pearson's chi-square test and Fisher's exact test were employed. The adopted level of statistical significance at all tests was 5%. The association measure odds ratio (OR) was also employed. In order to obtain the OR and relevant 95% confidence intervals, tabular analysis was employed for dichotomous variables and multinomial logistic regression models were employed for polytomous variables.

This study's power was estimated for a mean prevalence among outcomes of cardiovascular risk factors at 35%. An average difference of 8% for weight excess prevalence risk factors between groups (junior and seniors) was adopted. The adopted significance level was 5% and a statistical power of 91.1% was found.

RESULTS

Of the 154 nursing undergraduate students, 59.1% were junior and 40.9% were seniors. As for gender, 89.6% were women and 10.4% were men.

Mean age in the sample was 22.4 years (sd = 4.5). Predominant age while attending the course was between 20 and 24 years (52.6%). Junior were predominantly in the age group of 18 to 19 years (42.8%) and seniors were in the 25 and over age group (42.8%). There were proportional differences that were statistically significant concerning age distribution and age during the course ($p = 0.000$).

Over half of the students self-declared as having mixed ancestry (57.2%), followed by black (21.4%) and white and others (21.4%). Groups were proportionally similar when it came to ethnicity. A high proportion of single subjects was found, either in stable relationships (51.3%) or not in stable relationships (42.2%). A low proportion of married students was found (6.5%). Statistically significant proportional differences were found concerning marital status and age during the course, with a predominance of single students in stable relationships and an increase in the proportion of married seniors (12.7%) ($p = 0.017$).

Regarding monthly family income, most students came from families whose income was between 3 and 5 minimum wages (40.3%) or over 6 minimum wages (40.2%), whereas 19.5% came from families with income below 2 minimum wages. Groups were similar in terms of monthly family income and socioeconomic status.

For 50% of students, monthly expenses were below one minimum wage. A similar proportion was found for junior (57.1%). An increased frequency of seniors with personal expenses between 1 and 2 minimum wages (42.9%) was found. However, despite variations in monthly expenses, groups were proportionally similar ($p = 0.095$).

Table 1 shows excess weight indicators among junior and senior students. Overall analysis demonstrated a 59.1% prevalence for non-recommended waist circumference. Prevalences for junior and seniors were similar (60.3% vs. 58.2%). There was no trend for increase or decrease of statistically significant waist circumference values between groups. Odds ratio followed the same direction of the tendency test.

For waist-hip ratio, a prevalence of 32.5% was found for high risk and of 39.0% for very high risk in the sample. Similar prevalence was found for age during the course, both for high risk and for very high risk. There was no statistically significant trend for increase or decrease of waist-hip ratios. Odds ratio did not present significant results.

Table 1. Prevalence and odds ratio of anthropometric data of nursing undergraduate students of the first and last years (n = 154). Salvador, Bahia, Brazil, July - November 2011

Anthropometric data	Prev (%)	First year 91 (59.1%) Prev (%)	Last year 63 (40.9%) Prev (%)	p-value*	Odds ratio	Confidence interval (95%)
Waist circumference (IDF) in cm				0.80		
Recommended (< 90-M/< 80-W)						
Not recommended (≥ 90-M/≥ 80-W)	91 (59.1)	53 (58.2)	38 (60.3)		1.10	(0.57-2.09)
Waist-hip ratio (cm/cm)				0.25		
Low risk						
Moderate risk	37 (24.0)	25 (27.5)	12 (19.1)		0.64	(0.12-3.32)
High risk	50 (32.5)	30 (32.9)	20 (31.7)		0.89	(0.18-4.40)
Very high risk	60 (39.0)	32 (35.2)	28 (44.4)		1.17	(0.24-5.67)
BMI (weight/height²)				0.79		
Normal (18.5-24.9)						
Low weight (<18.5)	4 (2.6)	2(2.2)	3(3.2)		1.42	(0.20-10.5)
Overweight(≥ 25.0)	40 (26.0)	25 (27.5)	15 (23.8)		0.79	(0.37-1.71)
Obesity I (30-34.9) and II (35-39.9)	7 (4.5)	3 (3.3)	4 (6.4)		1.90	(0.40-8.93)

Source: Created by the authors. * Chi-square test for linear trend. M: Men; W: Women; IDF: International Diabetes Federation; BMI: Body Mass Index.

Regarding BMI, overall analysis showed a 26% prevalence for overweight and 4.5% for obesity I and II. Prevalence for overweight and obesity for junior were, respectively, 27.5% and 3.3%, and 23.8% and 6.4% for seniors. Therefore, a third of young adults were overweight. There was no trend for increase or decrease of BMI values between groups. Odds ratio did not present significant results.

DISCUSSION

This study focused on the comparison of excess weight among junior and senior nursing undergraduate students in a young college population that was predominantly female. The presence of women in nursing courses, even after men were introduced into the profession, is still prevalent⁷.

The researched group was also composed, mostly, of single black students, which can be explained by the fact that the study was conducted in Salvador, in the state of Bahia, which is the city with the largest afro-descendant population outside Africa¹¹. Prevalent family income was low, from three to five minimum wages. Low income makes access to goods and services more difficult, which can make it more difficult to adopt healthy habits⁴.

For both junior and seniors, a significant prevalence for visceral obesity was observed. This was evidenced by non-recommended waist circumference (58.2% and 60.3%), and moderate to very high risk for waist-hip ratio (67.1% and 76.1%), as well as for excess weight (27.5% and 23.8%). These parameters were superior to those of other studies conducted with students in the health and nursing fields^{5,7,8}. Both junior and seniors were exposed to excess weight, with no significant

statistical difference between them, which disproved the initial study's idea that exposure could be higher among seniors.

These data reinforce the idea that excess weight became a frequent issue in contemporary life. People seem to be more sedentary and to consume high quantities of industrially processed food - rich in saturated fats and sugars - and these habits seem to affect students before entering university and during their academic education. A sedentary behavior has also been widely promoted by technological advances in modern society, contributing to increase the time spent using computers, television, tablets, cell phones and others. The time students spend sitting down in classrooms and studying also adds to that.

It is possible that students, while rushing to manage various academic and personal life tasks, tend to eat fast food and high calorie foods that give the impression of fulfillment. Moreover, they can use public or individual transportation, which can impact excess weight.

These findings emphasize the importance of teaming up with the academic community to think about strategies to combat excess weight based on its determinants during the program. If strategies for obesity prevention and control are not implemented continuously and successfully, chances are that students will leave the program and enter the labor market with higher cardiovascular risk¹².

Results indicate the importance of health education programs during the education process and public university policies focused on encouraging physical activities and healthy eating habits, aiming to promote this group's health and avoid the suffering endured by obese persons¹³. They also bring about a reflection on the importance of the development of competences

in the academic education process so that future nurses be capable of appreciating healthy behaviors and encouraging people who receive their care to adopt it. In this sense, nurses have an important role, developing health education projects with students, aiming to contribute to their learning of these preventive and control measures for cardiovascular risk, as well as increasing their appreciation for life preservation through the adoption of healthier lifestyles.

Other studies must investigate students' excess weight determinants and their association with other cardiovascular risk factors, as well as explore these factors at different higher education institutions. The cross-sectional nature of this study can be considered a limitation, since it does not allow the establishment of cause and effect relationships and the use of convenience sampling.

CONCLUSION

Comparison of excess weight between junior and seniors in a nursing undergraduate course found, for both groups, high prevalence for overweight and obesity, increased waist circumference and high to very high risk for waist-hip ratio. Groups were similar in terms of the researched variables. Results point to a need for interventions and university policies for encouraging the adoption of healthy habits, as well as for the importance of the association of these results with other cardiovascular risk factors that are changeable. It is necessary to expand this research to a cohort design, especially focusing on students who participated in the study during the first year in the program, with the aim of assessing possible changes in exposure to excess weight.

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