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Prevalence of overweight and associated factors in healthcare workers at a hospital complex in southern Brazil

Prevalência de excesso de peso e fatores associados em trabalhadores da saúde de um complexo hospitalar do sul do Brasil

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ABSTRACT

Objective
To identify the prevalence and factors associated with excess weight in healthcare workers at a hospital complex in southern Brazil.

Methods
This is a cross-sectional study with secondary data from the local Occupational Medicine sector. Anthropometric, demographic, socioeconomic, lifestyle and occupational information were investigated. Multivariate analysis was performed using Poisson regression, with their respective prevalence ratios and significance level $p<0.05$.

Results
Three thousand one hundred and ninety-eight workers were included, 2,398 women (75.0%) with a mean age of 34.7±9.69 years. The prevalence of excess weight was 64.2%, which was significantly higher among men than among women (67.5% vs 63.1%, respectively). Excess weight was associated with lower education, lack of physical activity, being a healthcare professional and working less than 5 years at the institution. Work schedule, work shift and weekly workload are not associated with being overweight.

Conclusion
A high prevalence of excess weight was identified among healthcare professionals and associated factors included demographic, socioeconomic, lifestyle and occupational characteristics.

Keywords: Health personnel. Nutritional status. Obesity. Occupational Health. Overweight.

RESUMO

Objetivo

Identificar a prevalência e os fatores associados ao excesso de peso em trabalhadores da área da saúde de um complexo hospitalar do sul do Brasil.

Métodos

Trata-se de um estudo transversal com dados secundários do setor de Medicina do Trabalho do local. Investigaram-se informações antropométricas, demográficas, socioeconômica, estilo de vida e ocupacionais. A análise multivariada foi realizada através da regressão de Poisson, com suas respectivas razões de prevalência e nível de significância p<0,05.

Resultados

Foram incluídos 3.198 trabalhadores, sendo 2.398 mulheres (75,0%) com média de idade de 34,7±9,69 anos. A prevalência de excesso de peso foi de 64,2%, sendo esta significativamente maior entre os homens do que entre as mulheres (67,5% vs 63,1%, respectivamente). O excesso de peso mostrou-se associado à menor escolaridade, a falta de atividade física, ser profissional da área assistencial não médica e trabalhar menos de 5 anos na instituição. Escala de trabalho, turno de trabalho e carga horária semanal não apresentaram associação com o excesso de peso.

Conclusão

Foi identificada alta prevalência de excesso de peso entre os profissionais da saúde e os fatores associados incluíram as características demográficas, socioeconômica, estilo de vida e ocupacionais.

Palavras-chave: *Profissionais da saúde. Estado nutricional. Obesidade. Saúde do trabalhador. Sobrepeso.*

INTRODUCTION

Conceptually, obesity denotes excessive body fat accumulation, while overweight serves as an indicator of this condition, both categorized using the Body Mass Index (BMI) [1]. Excess weight (obesity and overweight) has increased globally over decades, with obesity currently recognized as a public health issue. Furthermore, it is identified as a risk factor for various comorbidities, including cardiovascular diseases, sleep apnea, stroke, arterial hypertension, diabetes mellitus, dyslipidemias, gallstones, certain cancers (breast, uterus, prostate, and bowel), and pulmonary diseases, among others [2].

The multifactorial determination of obesity involves environmental, genetic, and lifestyle factors. Among healthcare professionals, who operate in environments focused on health promotion, disease prevention, and treatment, a tendency towards excess weight over time exists. The prevalence of excess weight in these professionals has been associated with occupational factors. Increased consumption of fat-rich foods and physical inactivity may result from the transformations of work in the globalized world, which, while yielding benefits for the population, have also contributed to a decline in the quality of life and health of workers [3].

The contemporary general work environment demands high productivity [4]. This situation raises concern as it suggests that work overload hinders healthcare workers' self-care promotion, particularly regarding the difficulty in adopting a healthier lifestyle [5]. Among the consequences of excess weight for workers are decreased quality of life, reduced health-seeking behaviors, diminished workplace productivity, and increased absenteeism [6]. Additionally, healthcare workers have specific job characteristics, such as shift work, long hours, and high workload, which can compromise their lifestyle habits and health conditions, consequently impacting their nutritional status and increasing their predisposition to excess weight [7].

Healthcare workers in hospital settings, especially those directly involved in patient care, perform high-stress activities characterized by frequent exposure to physical and emotional suffering,

activity overload, excessive working hours, and professional devaluation [8,9]. This routine often impacts these workers' lives, such as reducing time for meals, leisure, rest, and sleep, leading to consequences that may result in increased body weight [10]. Thus, evaluating excess weight in this group of workers becomes important to map their health conditions and, in the future, serve as a subsidy for campaigns in the workplace to promote adequate health conditions. Given the above, this study seeks to identify the prevalence and associated factors of excess weight in workers of a hospital complex in Southern Brazil.

METHODS

This cross-sectional study utilized secondary data from workers at the Irmandade da Santa Casa de Misericórdia hospital complex in Porto Alegre, collected between 2021 and 2022. The selected research site is the oldest hospital in Rio Grande do Sul state and one of the most modern hospital complexes in the country, comprising nine hospitals dedicated to providing healthcare services that position the institution as a benchmark for excellence in medical-hospital care.

The study protocol was submitted to and approved by the Research Ethics Committee of the Irmandade da Santa Casa de Misericórdia of Porto Alegre (Opinion No. 5.638.417). Thus, the preservation of worker anonymity was established through the Subject's Confidentiality Declaration in the Study.

This study included all active adult and elderly workers with complete data in the medical records of the Occupational Medicine sector of the hospital complex. Participants with discrepant and inconsistent data, with extreme values inconsistent with reality, were excluded.

Study variables were collected directly from workers' medical records available in Occupational Medicine through the *Sênior* Program, a management software that organizes and automates worker information. Data recorded in medical records by the occupational physician were collected during pre-employment, periodic, or job change examinations. The frequency of data recording is at least annual. For this study, the most recent data for each worker was used. The Information Technology (IT) department assisted in exporting the data to Excel spreadsheets for subsequent database construction.

Independent variables included sex (female and male), age (in completed years), educational attainment (up to secondary education and higher education or above), and physical exercise practice (yes or no). Additionally, occupational characteristics investigated were professional category (1. support – professionals from other areas, such as cleaning, security, among others; 2. care – non-medical healthcare professionals; 3. administrative – administrative support professionals, such as receptionists; and 4. medical – professionals of any medical specialty), weekly working hours (<40 hours and ≥40 hours), work shift (daytime and nighttime – shift between 9:00 pm one day and 6:00 am the next day), work schedule (5x2 – work for 5 consecutive days followed by 2 days off; 6x1 – work for 6 days with 1 day off; and 12x36 – work for 12 hours followed by 36 hours off), and length of employment at the institution (≤5 years, 6 to 9 years, and ≥10 years). Professional categories were categorized this way, distinguishing work niches by their operational differences, in addition to allowing greater comparability with other studies using the same categories.

The outcome variable "excess weight" was obtained through the assessment of individuals' nutritional status, using the BMI calculation. The BMI was calculated from weight and height measurements, using the following equation: weight (in kilograms) divided by height (in meters) squared. Weight and height data were self-reported by workers during the medical consultation and

recorded in their medical records. Excess weight (overweight and obesity) was defined according to the World Health Organization [11] cutoff point for adults (BMI ≥25kg/m^2) and according to the Pan American Health Organization [12] for the elderly (BMI ≥28kg/m^2).

Descriptive statistics were used to characterize the overall sample and to describe the distribution of the outcome under study, using absolute and relative frequencies for categorical variables and mean with its respective standard deviation for continuous variables. For analysis between the outcome variable (excess weight) and the exposure variables (independent), the Chi-square test was used for categorical variables and the Student's *t*-test for comparing means.

Crude and adjusted Prevalence Ratios (PR) of excess weight were calculated for all study variables using Poisson regression with a robust estimator, considering a 95% Confidence Interval (CI). For the calculation of adjusted ratios, excess weight was considered the outcome variable, and all independent variables that presented $p<0.20$ in the crude analysis were included in the model. All analyses were performed using IBM®SPSS® (version 25), considering a significance level of 5% ($p<0.05$).

RESULTS

A total of 3,198 workers were enrolled in the study, predominantly female, with a mean age of approximately 35 years (SD=9.69). Most participants worked in direct patient care roles, followed by support, administrative, and medical fields. Table 1 shows demographic, socioeconomic, lifestyle, and occupational characteristics of workers included, by excess weight.

Excess weight prevalence was 64.2% (35.5% overweight and 28.7% obesity), being more prevalent among older workers, males, those with lower educational attainment, and those who did not engage in physical activity. Regarding occupational traits, excess weight prevalence was higher in support and patient care workers, those working night shifts, with a 12x36 shift schedule, and those employed at the institution for more than five years. No statistically significant association was found between excess weight and weekly working hours (Table 1).

Table 1 – Sample distribution according to demographic, socioeconomic, lifestyle and occupational characteristics of non-overweight and overweight healthcare workers from a hospital complex in southern Brazil. [N (%) or Mean (SD)]. Porto Alegre/RS, 2022. (N=3,198).

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Characteristics	Total (N=3,198)	Non-overweight (N=1,146) 35.8%	Overweight (N=2,052) 64.2%	*p*-value
Sex				0.02
Male	800 (25.0)	260 (32.5)	540 (67.5)	
Female	2,398 (75.0)	886 (36.9)	1,512 (63.1)	
Age (years)*	34.77 (9.69)	32.82 (9.7)	35.86 (9.6)	<0.001
Education				<0.001
Up to secondary education	2,221 (69.5)	674 (30.3)	1,547 (69.7)	
Higher education or more	977 (30.6)	472 (48.3)	505 (51.7)	
Physical activity (N=3,191)				<0.001
No	1,804 (56.5)	573 (31.8)	1,231 (68.2)	
Yes	1,387 (43.4)	571 (41.2)	816 (58.8)	
Professional category				<0.001
Administrative	573 (17.9)	228 (39.8)	345 (60.2)	
Support	827 (25.9)	275 (33.3)	552 (66.7)	
Care	1,636 (51.2)	551 (33.7)	1,085 (66.3)	
Medical	162 (5.1)	92 (56.8)	70 (43.2)	

Table 1 – Sample distribution according to demographic, socioeconomic, lifestyle and occupational characteristics of non-overweight and overweight healthcare workers from a hospital complex in southern Brazil. [N (%) or Mean (SD)]. Porto Alegre/RS, 2022. (N=3,198).

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Characteristics	Total (N=3,198)	Non-overweight (N=1,146) 35.8%	Overweight (N=2,052) 64.2%	*p*-value
Weekly workload				0.58
< 40h	1,411 (44.1)	513 (36.4)	898 (63.6)	
≥ 40h	1,787 (55.9)	633 (35.4)	1,154 (64.6)	
Work shift				0.02
Daytime	2,842 (88.9)	1,038 (36.5)	1,804 (63.5)	
Nighttime	356 (11.1)	108 (30.3)	248 (69.7)	
Work schedule				<0.001
5x2	868 (27.1)	347 (40.0)	521 (60.0)	
6x1	1,956 (61.2)	694 (35.5)	1,262 (64.5)	
12x36	374 (11.7)	105 (28.1)	269 (71.9)	
Length of employment at the institution (N=3,197)				0.02
Up to 5 years	2,551 (79.8)	945 (37.0)	1,606 (63.0)	
6 to 9 years	316 (9.9)	97 (30.7)	219 (69.3)	
≥ 10 years	330 (10.3)	103 (31.2)	227 (68.8)	

Note: *Student's *t*-test for age comparison. Chi-square test for comparison of categorical variables.

Table 2 displays crude and adjusted prevalence ratios for overweight, according to the investigated variables. Following adjusted analysis, overweight prevalence was significantly higher in males (PR=1.09; 95% CI=1.05-1.14), with increasing age (PR=1.01; 95% CI=1.00-1.01), lower education (PR=1.17; 95% CI=1.12-1.22), physical inactivity (PR=1.08; 95% CI=1.04-1.12), and employment in direct patient care (PR=1.16; 95% CI=1.06-1.27). Work tenure showed an inverse relationship with overweight, with workers having shorter tenure at the institution exhibiting higher overweight prevalence compared to those with longer tenure. Although work shift and work schedule showed a trend of association in the crude analysis, these lost significance after adjustment (Table 2).

Table 2 – Crude and adjusted prevalence ratios according to demographic, socioeconomic, health and occupational characteristics of non-overweight and overweight healthcare workers from a hospital complex in southern Brazil. Porto Alegre/RS, 2022. (N=3,198).

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Characteristics	Crude PR* (95% CI)	*p*-value	Adjusted PR** (95% CI)	*p*-value
Sex		0.02		<0.001
Male	1.04 (1.01-1.09)		1.09 (1.05-1.14)	
Female	1.00		1.00	
Age (years)*	1.008 (1.00-1.01)	<0.001	1.01 (1.00-1.01)	<0.001
Education		<0.001		<0.001
Up to secondary education	1.20 (1.15-1.24)		1.17 (1.12-1.22)	
Higher education or more	1.00		1.00	
Physical activity (N=3,191)		<0.001		<0.001
No	1.10 (1.06-1.14)		1.08 (1.04-1.12)	
Yes	1.00		1.00	
Professional category		<0.001		0.004
Administrative	1.18 (1.09-1.29)		1.11 (1.01-1.22)	
Support	1.27 (1.16-1.37)		1.12 (1.02-1.23)	
Care	1.26 (1.16-1.36)		1.16 (1.06-1.27)	
Medical	1.00		1.00	
Work shift		0.02		0.39
Daytime	1.06 (1.01-1.12)		0.95 (0.85-1.07)	
Nighttime	1.00		1.00	

Table 2 – Crude and adjusted prevalence ratios according to demographic, socioeconomic, health and occupational characteristics of non-overweight and overweight healthcare workers from a hospital complex in southern Brazil. Porto Alegre/RS, 2022. (N=3,198).

Characteristics	Crude PR* (95% CI)	*p*-value	Adjusted PR** (95% CI)	*p*-value
Work schedule		<0.001		0.15
5x2	1.13 (1.06-1.19)		1.11 (0.99-1.24)	
6x1	1.05 (1.01-1.09)		0.99 (0.95-1.04)	
12x36	1.00		1.00	
Length of employment at the institution (N=3,197)		0.01		0.02
Up to 5 years	1.00		1.00	
6 to 9 years	1.06 (1.00-1.12)		0.98 (0.92-1.03)	
≥ 10 years	1.06 (1.01-1.13)		0.91 (0.86-0.92)	

Note: *Poisson regression with robust estimator. **Analysis adjusted by multivariate model, including variables that presented *p*<0.20 in the crude analysis. CI: Confidence Interval; PR: Prevalence Ratios.

DISCUSSION

This study aimed to evaluate the prevalence of overweight and its associated factors in workers at a hospital complex. The data indicated a high prevalence of overweight. The temporal trend of overweight in Brazilian capitals between 2006 and 2019 confirms an unfavorable evolution of indicators related to excess weight [13].

Regarding healthcare workers, the prevalence of overweight reaches considerable proportions, as observed in the present study. Other studies involving workers in Brazilian hospitals have demonstrated varying prevalence of overweight. In the municipality of Londrina (PR), a study conducted with 380 workers from a university hospital showed an overweight prevalence of 63.9% [14], similar to that found in this study. Likewise, a study with nursing workers from an emergency hospital in the southern portion of Brazil observed an overweight prevalence of 68.9% [15]. In other studies, the observed overweight prevalence was around 45% [16,17]. This variation may be due to other factors such as hospital location and city development conditions, for example.

Over the years, changes have occurred in the population's dietary patterns (nutritional and food transition), which are strongly linked to demographic and social modifications [18,19]. In the present study, demographic, socioeconomic, lifestyle, and occupational factors were associated with the prevalence of overweight. Previous studies have verified an increase in overweight prevalence with advancing age [7,18,20], consistent with the findings of this study. According to 2019 *Vigilância de Fatores de Risco e Proteção para Doenças Crônicas por Inquérito Telefônico* (Vigitel, Risk and Protective Factors Surveillance System for Chronic Diseases by Telephone Interviews) data, overweight prevalence increases with age, exceeding 50% in the 25 to 39-year age group [13]. Studies show that the highest overweight prevalence is found in the 31 to 40-year age range [20,21], corroborating the average age found in this study. This increase in overweight with advancing age is a common aging process, related to environmental factors such as sedentary behavior and high-energy food consumption. Besides environmental factors, physiological factors, such as reduced metabolism and hormonal changes, can contribute to increased body fat levels with age [22].

Educational attainment is directly associated with family income and can reflect in intellectual development and health status, contributing to overweight occurrence. Furthermore, educational attainment affects other factors like food choices and access to healthy eating information [18]. A dietary survey suggests that individuals with higher education levels tend to have healthier

eating habits, with greater consumption of fruits, vegetables, and greens [19]. The results of this investigation showed a higher occurrence of overweight among individuals with lower education levels. Other studies identified an increased overweight prevalence with fewer years of schooling [15,17]. The Vigitel survey, 2019, shows that overweight frequency notably decreases with increasing education, from 61% among those with up to eight years of schooling to 52.2% among individuals with twelve or more years of education [13].

Some studies have indicated the influence of occupational characteristics on worker health [7,17,20]. Overweight in municipal workers in the city of Belo Horizonte (MG) was associated with sociodemographic, health, and occupational characteristics [7], also found in the present study. Healthcare workers have work-related specificities, such as shift work, excessive demands, long hours, high workload, and physical and mental stress [23,24], which can compromise eating habits and physical activity. Added to this scenario is the high rate of sedentary behavior verified in this study, as more than half of the participants did not engage in any physical activity. These combined factors influence nutritional status and increase the risk of developing overweight and Non-Communicable Diseases (NCDs) [25].

Longer time working at the institution presented a protective factor for overweight prevalence, unlike another study that found no association [20]. Being at the same institution longer may indicate greater organization of their work routine and the adoption of healthier habits due to this organization. Another study with nursing professionals showed a higher prevalence in workers with more years of service [26]. Although no association was found between overweight and work shift and work schedule, studies have shown that these two work characteristics are associated with overweight [15,26-28].

It is noteworthy that overweight was not associated with weekly working hours; however, this study did not investigate the multiple job holdings among workers, which is a common practice observed in healthcare, characterizing a higher workload. Thus, the results of the association of overweight with weekly working hours in this study may have been biased. As demonstrated in some studies, long or double work shifts can result in negative reflections on the quality of life of these professionals. These workers may present physiological changes due to sleep and metabolism alterations, presence of anxiety and compulsive eating, compromising lifestyle habits, health conditions, and nutritional status, generating favorable conditions for the onset of overweight and obesity [29]. A study conducted with 215 healthcare professionals in the municipality of Montes Claros (MG) observed that having another employment bond was associated with workers' overweight [20].

This study included a group of healthcare workers, who would supposedly be in better health conditions than other professional categories, considering that they deal with education and guidance for the general population on health care and its consequences, especially in disease prevention and health promotion [30]. Thus, healthcare professionals are expected to act as role models, as their health behaviors can encourage patients' attitudes and influence them to make lifestyle changes. However, for this to happen, public policies are needed so that these workers have a work environment that can function as a health promoter, since overweight is a multifactorial condition.

Our findings should be interpreted considering some limitations. This is a retrospective cross-sectional study using secondary data, without data on other variables that could influence this scenario, such as income and eating habits. Furthermore, the study only evaluated associations between variables, without the possibility of defining cause-and-effect relationships. Data collection was carried out by several medical professionals, and this methodology makes standardization in information collection impossible. Additionally, workers with incomplete data were not included in the

study. The sole use of BMI as a definition of obesity and overweight can also be seen as a limitation. Also, the study is of a local nature; however, this set of data is important for surveying the health conditions of Brazilian workers. Another limitation of this study was the self-reporting of weight and height, which may be subject to a tendency of distortion towards a more favorable direction [31]; however, the use of self-reported measures can benefit studies with a large sample size [32].

On the other hand, among the positive aspects of the present study, its sample size stands out, including workers from different professional categories (care, support, administrative, and medical) from a hospital complex in southern Brazil. Furthermore, this study can contribute to the understanding of the health profile of these workers, for the development of future programs and strategies aimed at specific groups.

Given the scarcity of studies on overweight in healthcare workers, it is suggested that longitudinal studies be conducted to verify the determination of the observed associations and that studies be carried out with the objective of identifying other potential risk factors for overweight in healthcare workers, such as eating habits.

CONCLUSION

This study identified a high prevalence of overweight among healthcare professionals. Furthermore, overweight was associated with lower education, lack of physical exercise, working in direct patient care, and having worked less than 5 years at the institution. Work schedule, work shift, and weekly working hours did not show association with overweight.

The high prevalence of overweight observed in this study underscores the importance of understanding the specific health profile of healthcare workers. Demographic, socioeconomic, lifestyle, and occupational characteristics were associated with overweight. From this perspective, the results of this study highlight the importance and necessity of nutritional monitoring for these workers. However, this topic is very complex, and other factors involved cannot be disregarded. This investigation is fundamental and can support the implementation of workplace health promotion and overweight prevention interventions, aiming to encourage healthy eating habits and regular physical activity, in addition to promoting a work environment with adequate physical and mental conditions, aiming at improving the quality of life of workers.

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