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ORIGINAL ARTICLE

Prevalence and factors associated with abdominal obesity among women working as community health agents

Prevalência e fatores associados à obesidade abdominal de mulheres atuantes como agentes comunitárias de saúde

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ABSTRACT

Introduction: The prevalence of abdominal obesity has increased significantly in recent years and is more frequently observed among women than men. Studies have shown that women in the labor market exhibit higher rates of abdominal obesity, along with other associated metabolic dysfunctions. **Objective:** To estimate the prevalence of abdominal obesity and its associated factors among female Community Health Workers. **Methods**: This is a cross-sectional, analytical study conducted in a major center located in northern Minas Gerais, Brazil. The dependent variable was the presence of abdominal obesity, evaluated through the measurement of Waist Circumference (WC). Sociodemographic, occupational, and clinical factors were also evaluated. Descriptive analyses were performed, and associations were tested using Poisson multiple regression with robust variance. **Results:** A total of 565 Community Health Agents participated in the study. Of these, 57.6% (n=389) presented a high prevalence of abdominal obesity. Variables associated with abdominal obesity included age ≥ 37 years (PR=1.48; 95%CI=1.25–1.75), poor self-perceived health status (PR=1.30; 95%CI=1.13–1.51), the presence of diabetes (PR=1.47; 95%CI=1.24–1.75), and hypertension (PR=1.22; 95%CI=1.04–1.44). **Conclusion**: A high prevalence of abdominal obesity was observed, with the condition showing significant associations with advanced age, poor self-perception of health status, and the presence of diabetes and hypertension.

Keywords: Community health agentes; Obesity; Abdominal obesity; Waist circumference.

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RESUMO

Introdução: A prevalência de obesidade abdominal tem mostrado um aumento significativo nos últimos anos, sendo mais prevalente entre as mulheres em comparação aos homens. Observa-se que mulheres inseridas no mercado de trabalho apresentam taxas mais elevadas de obesidade abdominal, assim como outras disfunções metabólicas associadas. **Objetivo:** Estimar a prevalência de obesidade abdominal, bem como os fatores associados em mulheres Agentes Comunitárias de Saúde. **Métodos:** Trata-se de um estudo transversal, analítico, realizado em um grande Centro localizado no Norte de Minas Gerais, Brasil. A variável dependente foi a presença da obesidade abdominal, avaliada por meio da aferição da Circunferência da Cintura (CC), além da avaliação dos fatores sociodemográficos, laborais e clínicos. Foram realizadas análises descritivas e as associações por meio da regressão múltipla de Poisson com variância robusta. **Resultados:** Participaram do estudo 565 Agentes Comunitários de Saúde. Dessas, 57.6% (n=389) apresentaram elevada prevalência da obesidade abdominal. As variáveis que se mostraram associadas à obesidade abdominal foram idade maior ou igual a 37 anos (RP=1,48; IC95%=1,25-1,75) percepção do estado de saúde ruim (RP=1,30; IC95%=1,13-1,51) presença de diabetes (RP=1,47; IC95%=1,24-1,75) e hipertensão (RP=1,22; IC95%=1,04-1,44). **Conclusão:** Foi observada uma elevada prevalência de obesidade abdominal, com a condição estando significativamente associada a fatores como idade avançada, percepção negativa do estado de saúde e a presença de diabetes e hipertensão.

Palavras-chave: Agentes comunitários de saúde; Obesidade; Obesidade abdominal; Circunferência da cintura.

INTRODUCTION

Obesity is characterized by the excessive accumulation of adipose tissue in the body, exceeding anthropometric normality to varying degrees[1]. It is recognized as a growing public health problem due to its high prevalence and its association with an increased risk of multiple chronic diseases, including diabetes and cardiovascular diseases[2].

The pattern of fat distribution plays a crucial role in determining metabolic risk[3]. Abdominal obesity, assessed by waist circumference (WC), is more pathogenic and is therefore more closely associated with most metabolic abnormalities than general obesity[4,5].

The prevalence of abdominal obesity has been increasing in recent years and is more common among women than men[6,7]. Studies indicate that women, especially those in the labor market, present a higher prevalence of abdominal obesity, as well as other metabolic disorders[6]. Physiological changes, women's social roles, the combination of household and work responsibilities, a sedentary lifestyle, and middle age may be related to the prevalence of abdominal obesity[8].

Among the most affected women, Community Health Agents (CHAs) stand out. CHAs provide guidance on healthy lifestyle habits, including diet, physical activity, and body weight control, contributing to the management of chronic diseases in primary health care[9]. However, studies suggest that CHAs do not consistently follow health promotion guidelines in their own behaviors, which negatively impacts their health[10].

Identifying factors associated with the occurrence of abdominal obesity in CHAs is an important area of investigation, as it can influence the implementation of actions to promote and protect their health, as well as improve their quality of life and work. In this context, the aim of this study is to investigate the prevalence of, and factors associated with, abdominal obesity among CHAs working in a large urban center in northern Minas Gerais.

Methods

This is an analytical cross-sectional study, derived from a research project entitled "*Working Conditions and Health of Community Health Agents in Northern Minas Gerais: A Longitudinal Study*", conducted in the city of Montes Claros, MG.

At the time of the study, 135 Family Health Strategy (FHS) teams were operating in the municipality of Montes Claros, with a total of 600 CHAs, who comprised the target population. All CHAs were invited to participate through an invitation letter sent by the researchers via the municipality's primary care coordinator, on a voluntary basis. However, 35 professionals were either out of work or on sick leave and were excluded from the study. Thus, a total of 565 CHAs participated in the investigation.

Prior to data collection, the interviewers were trained, and a pilot study was conducted with 15 CHAs to standardize the survey procedures. The pilot study allowed for practical testing of the questionnaires and the interviewers' performance. After this phase, the field research began.

Health professionals, together with undergraduate students, conducted the data collection individually, in a reserved room at the Regional Reference Centre for Workers' Health (CEREST), on weekdays during the morning shift, between August and October 2018. The instrument consisted of an anthropometric assessment and questionnaires covering sociodemographic, work-related, self-perceived health status, and clinical factors.

The dependent variable in this study was abdominal obesity, measured by waist circumference (WC). The measurement was considered elevated when it exceeded 80 cm and was then categorized as normal or altered according to the cut-off points recommended by the World Health Organization[11]. The assessment was performed with the CHAs in an upright position, breathing normally, with their feet together, the upper part of their clothing (shirt) lifted, and their arms crossed in front of their chest. The measurement was taken with a measuring tape at the midpoint between the iliac crest and the lower edge of the last costal arch, in a private room.

The independent variables included sociodemographic, occupational, and clinical factors. Sociodemographic factors comprised age (up to 36 years and 11 months / ≥ 37 years); skin color (non-white / white); marital status (has a partner / does not have a partner); education level (completed higher education / up to high school education); and family income (greater than 1 minimum wage / up to 1 minimum wage).

The occupational variable referred to the length of time working in the position and was assessed through the following question: "How long have you been working as a CHA?" Subsequently, the variable was dichotomized based on the median value into two categories: up to 5 years and more than 5 years.

Clinical conditions were assessed through self-report. The presence of diabetes and hypertension was investigated using questions taken from Vigitel (2018)[12]: "Has a doctor ever told you that you have diabetes? What about hypertension?". The responses were then dichotomized as: "yes" and "no". Self-perceived health status was assessed with the question: "Compared to people your age, how do you describe your health?" The four response categories were dichotomized into positive (for the "very good" and "good" options) and negative (for the "fair" and "poor" options)[13].

The data was tabulated using the Statistical Package for the Social Sciences (SPSS)® software, version 22.0. To analyze the association between abdominal obesity and the independent variables, a bivariate analysis was performed using Pearson's $\chi2$ test. Variables that showed an association at a significance level of up to 20.0% ($p \leq 0.20$) were selected for Poisson multiple regression analysis with robust variance. To estimate the magnitude of the associations, adjusted prevalence ratios (PR) and their respective 95% confidence intervals (95% CI) were calculated. A significance level of 5.0% ($p<0.05$) was adopted for the final model.

The study was approved by the Research Ethics Committee of the State University of Montes Claros on December 8, 2017, under protocol number 2.425.756. All participants signed the Free and Informed Consent Form as a prerequisite for data collection.

Results

A total of 565 Community Health Agents participated in the study. Of these, 55.2% (n=312) had an altered waist circumference. The characteristics of the group assessed are presented in Table 1. The majority of CHAs were over 37 years old (53.8%), non-white (87.4%), had a partner (62.3%), had completed up to high school education (59.2%), and had a family income of more than one minimum wage (92.4%).

Table 2 presents the results of the crude and adjusted analyses of the association between participant characteristics and abdominal obesity. Variables that showed a significant association with abdominal obesity in the crude analysis were: age (PR=1.57; 95%CI=1.33–1.85), marital status (PR=0.80; 95%CI=0.68–0.94), family income (PR=1.24; 95%CI=0.99–1.55), self-perceived health status (PR=1.35; 95%CI=1.16–1.56), diabetes (PR=1.50; 95%CI=1.26–1.78), and hypertension (PR=1.53; 95%CI=1.31–1.78).

After multivariate analysis, the variables that remained significantly associated with abdominal obesity were: age ≥37 years (PR=1.48; 95%CI=1.25–1.75; $p<0.001$), poor self-perceived health status (PR=1.30; 95%CI=1.13–1.51; $p<0.001$), the presence of diabetes (PR=1.47; 95%CI=1.24–1.75; $p<0.001$), and hypertension (PR=1.22; 95%CI=1.04–1.44; $p=0.014$).

Table 1. Prevalence of abdominal obesity, and sociodemographic, occupational, and clinical characteristics of Community Health Agents (n=565). Montes Claros, 2018.

Variables		Community Health Agents	
		n	%
Outcome variable			
Abdominal obesity	Normal WC	253	44.8
	Altered WC	312	55.2
Sociodemographic factors			
Age	Up to 36 years and 11 months	261	46.2
	≥ 37 years	304	53.8
Skin color	Non-white	494	87.4
	White	71	12.6
Marital status	Has a partner	352	62.3
	Does not have a partner	213	37.7
Education level	Completed higher education	236	41.8
	Up to high school education	329	59.2
Family income	Greater than 1 minimum wage	522	92.4
	Up to 1 minimum wage	43	7.6
Occupational factor			
Time as a CHA	Up to 5 years	312	55.2
	More than 5 years	253	44.8
Clinical factors			
Self-perception of health status	Good	330	58.4
	Bad	235	41.6
Diabetes	No	546	96.6
	Yes	19	3.4
Hypertension	No	505	89.4
	Yes	60	10.6

Source: Elaborated by authors, 2024.

Table 2. Crude and adjusted analyses of the association between abdominal obesity (normal and altered waist circumference) and sociodemographic, occupational, and clinical factors (n=565). Montes Claros, 2018.

Variables		Abdominal obesity				Gross PR (CI95%)	*p*	Adjusted PR (CI95%)	*p*
		Normal WC		Altered WC					
		n	%	n	%				
Sociodemographic factors									
Age	Up to 36 years old	151	57.9	110	42.1	1.00	0.000	1.00	0.000
	≥37 years	102	33.6	202	66.4	1.57 (1.33-1.85)		1.48 (1.25-1.75)	
Skin color	Non-white	223	45.1	271	54.9	1.00	0.494	1.00	0.595
	White	30	42.3	41	57.7	1.06 (0.89-1.27)		1.04 (0.88-1.24)	
Marital status	Has a partner	142	40.3	210	59.7	1.00	0.009	1.00	0.065
	Does not have a partner	111	52.1	102	47.9	0.80 (0.68-0.94)		0.86 (0.73-1.00)	

continue...

... continued Table 2

Variables		Abdominal obesity				Gross PR (CI95%)	*p*	Adjusted PR (CI95%)	*p*
		Normal WC		Altered WC					
		n	%	n	%				
Education level	Completed higher education	120	50.8	116	49.2	1.00	0.068	1.00	0.092
	Up to high school education	133	40.4	196	59.6	1.12 (0.99-1.28)		1.11 (0.95-1.27)	
Family income	Up to 1 minimum wage	239	45.8	283	54.2	1.00	0.054	1.00	0.095
	Greater than 1 minimum wage	14	32.6	29	67.4	1.24 (0.99-1.55)		1.20 (0.96-1.49)	
Work factor									
Time as a CHA	Up to 5 years	142	45.5	170	54.5	1.00	0.459	1.00	0.623
	More than 5 years	111	43.9	142	56.1	1.04 (0.92-1.19)		1.03 (0.91-1.17)	
Clinical factors									
Self-perception of health status	Good	171	51.8	159	48.2	1.00	0.000	1.00	0.000
	Bad	82	34.9	153	65.1	1.35 (1.16-1.56)		1.30 (1.13-1.51)	
Diabetes	No	250	45.8	296	54.2	1.00	0,000	1.00	0.000
	Yes	3	15.8	16	84.2	1.50 (1.26-1.78)		1.47 (1.24-1.75)	
Hypertension	No	241	47.7	264	52.3	1.00	0,000	1.00	0.014
	Yes	12	20.0	48	80.0	1.53 (1.31-1.78)		1.22 (1.04-1.44)	

Source: Elaborated by authors, 2024.

Discussion

This study found a high prevalence of abdominal obesity among the Community Health Agents assessed, and an association with sociodemographic and clinical factors. In the international context, a recent study conducted in China with women aged 18 to 59 years reported a 42% prevalence of abdominal obesity[14]. In Brazil, a longitudinal study on adult health (ELSA-Brasil), published in 2022 and conducted with women, identified a prevalence of 30.33%[15]. Higher rates were observed in studies conducted in the state of Minas Gerais with *quilombola* women, among whom the prevalence of abdominal obesity reached 71.3%[16].

Abdominal obesity is strongly associated with chronic diseases and acts as an independent risk factor for metabolic disorders[17], heart failure[18], and cardiovascular diseases (CVD)[14]. Several pathways contribute to the development of these conditions, such as the release of pro-inflammatory cytokines, which induce chronic inflammation, metabolic dysfunction, cell differentiation, and angiogenesis[19]. In light of this, interventionist measures should be implemented, especially considering the work profile of the women assessed in this study.

In this study, abdominal obesity was significantly associated with advancing age. This finding is consistent with studies conducted by Queiroz et al. (2021)[16] and Gibson et al. (2023)[20]. This association can be explained by changes inherent to aging, particularly in women, including hormonal alterations and a reduction in basal metabolic rates, which lead to changes in body composition, such as the accumulation of abdominal fat[21]. Middle-aged women generally experience an average increase in waist circumference of up to 2.2 cm[22], which can contribute to the development of cardiovascular and metabolic diseases, such as insulin resistance and type 2 diabetes[23]. Therefore, a better understanding of the underlying mechanisms that drive the accumulation of abdominal fat during middle age — especially among this population — is both timely and relevant.

Negative self-perception of health is a risk factor for physical inactivity and prolonged screen time, according to Santos et al. (2022)[24]. This condition can lead to complications, such as the emergence of abdominal obesity, as shown in a study by Coelho et al. (2023)[25]. In the present study, CHAs who reported a poorer perception of their health status exhibited a higher prevalence of abdominal obesity. Self-perceived health is a strong predictor of morbidity and mortality, even when other factors — such as physical, psychosocial, and sociodemographic variables — are controlled[26]. For these reasons, self-perceived health is considered a useful indicator and a practical tool in population health surveys[13].

After multivariate analysis, the presence of diabetes and hypertension remained associated with abdominal obesity. These findings are consistent with those reported by Silveira et al. (2018)[27] in studies conducted with women. These results are noteworthy, given that CHAs are also responsible for raising awareness among the population about the prevention of Chronic Non-Communicable Diseases (CNCDs), including abdominal obesity. These professionals play a fundamental role in improving population health conditions, acting as a link between the health team and the community, which facilitates access to services offered by the Unified Health System (SUS)[28].

In view of this, it is essential to strengthen training and awareness-raising strategies regarding these conditions — not only to improve the health of Community Health Agents, but also to enable them to fulfill their educational role more effectively. Awareness-raising measures and continuous training for these professionals should be reinforced to ensure that they acquire the necessary knowledge to promote the prevention and proper management of abdominal obesity and other CNCDs, both in relation to their own health and within the communities in which they work.

This study has a limitation that should be acknowledged: its cross-sectional design does not allow for cause-and-effect inferences between the outcome variable and the variables analyzed. Nevertheless, the relevance of this research is notable, given that it was conducted in a large urban center in northern Minas Gerais, Brazil, and included a representative population of CHAs. The findings may serve as a basis for future studies focusing on this population and CNCDs.

Conclusion

This study identified a high prevalence of abdominal obesity among Community Health Agents (CHAs) in the city of Montes Claros, Minas Gerais. The variables age ≥ 37 years, poor self-perceived health status, and the presence of diabetes and hypertension were associated with the outcome investigated. The results highlight the need for a more attentive approach to CHAs, particularly in promoting healthier lifestyles. These findings may encourage health managers to develop actions aimed at supporting CHAs, who play an important role in consolidating the reorientation of the health care model.

Author's Contribution

We describe contributions to the papers using the taxonomy (*CRediT*) provided above:

Conceptualization, Investigation, Methodology, Visualization & Writing – review & editing: JSBR; MCBR; JGBR. *Project administration, Supervision & Writing – original draft*: JSBR; MCBR; JGBR. *Validation & Software*: FPSL de O; AAF. *Data curation & Formal Analysis*: JSBR.

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