

Indicadores antropométricos e fatores associados: um estudo em policiais civis de Vitória-ES, Brasil

The anthropometric indicators and associated factors: a study in civilian police officers from Vitória-ES, Brazil

Luciane Bresciani Salaroli¹
Renata Manoel²
Miriani Delfino Botacim²
Glenda Blaser Petarli³
Monica Cattafesta⁴
Eliana Zandonade⁵

¹ Universidade Federal do Espírito Santo, Curso de Nutrição, Departamento de Educação Integrada em Saúde, Programa de Pós-graduação em Nutrição e Saúde, Programa de Pós-graduação em Saúde Coletiva. Vitória-ES, Brasil.

² Universidade Federal do Espírito Santo, Curso de Nutrição, Departamento de Educação Integrada em Saúde. Vitória-ES, Brasil.

³ Universidade Federal do Espírito Santo, Hospital Universitário Cassiano Antônio de Moraes. Vitória-ES, Brasil.

⁴ Universidade Federal do Espírito Santo, Curso de Nutrição, Departamento de Educação Integrada em Saúde, Programa de Pós-graduação em Nutrição e Saúde. Vitória-ES, Brasil.

⁵ Universidade Federal do Espírito Santo, Departamento de Estatística, Programa de Pós-graduação em Saúde Coletiva. Vitória-ES, Brasil.

Correspondence
Luciane Bresciani Salaroli
E-mail: lucianebresciani@gmail.com

Abstract

Modern society has undergone changes in dietary and behavioral patterns, negatively influencing the workers' health, as in the case of police officers, contributing to illness and endangering the nutritional status in this group. The study aimed to investigate the anthropometric indicators (body mass index – BMI and waist circumference – CC) and its relationship to sociodemographic factors, labor and eating habits in civilian police of Vitoria/ES. This is a cross-sectional study, with 133 policemen, aged between 25 and 65 years, of both sexes, who worked in the region of Grande Vitória/ES, randomly selected. A chi-square test and a multivariate logistic regression for variables which were statistically significant up to 20% were performed. A high prevalence of overweight was found (64.3%; n = 83), BMI was associated with high economic class, male, considering the stressful work and the habit of having breakfast outside their home and CC associated to the age of 40 years. The importance of anthropometric evaluation in civilian police is highlighted, in order to identify factors associated with inadequate nutritional status.

Keywords: Police. Nutritional status. Food habits. Occupational health. Working conditions.

Resumo

A sociedade moderna tem passado por alterações nos padrões alimentares e comportamentais, influenciando negativamente a saúde do trabalhador, como no caso de policiais civis,

contribuindo com o adocimento e o comprometimento do estado nutricional neste grupo. O estudo teve como objetivo investigar indicadores antropométricos (Índice de Massa Corporal – IMC e Circunferência de Cintura – CC) e sua relação com fatores sociodemográficos, laborais e de hábitos alimentares em policiais civis de Vitória/ES. Utilizou-se metodologia quantitativa e transversal, com 133 policiais, com idade entre 25 e 65 anos, de ambos os sexos, que trabalhassem na região da Grande Vitória/ES, selecionados de forma aleatória. Foram realizados testes qui-quadrado e regressão logística multivariada para as variáveis que apresentaram significância estatística de até 20%. Constatou-se alta prevalência de excesso de peso (64,3%; n = 83), o IMC se relacionou com classe econômica elevada, sexo masculino, considerar o trabalho estressante e hábito de realizar café da manhã fora do lar, e a CC se associou à idade superior a 40 anos. Ressalta-se a importância da avaliação antropométrica em policiais civis, a fim de identificar fatores associados à inadequação do estado nutricional.

Palavras-chave: Polícia. Estado nutricional. Hábitos alimentares. Saúde do trabalhador. Condições de trabalho.

Introduction

In Brazil, Chronic Non-communicable Diseases (NCDs) have been accounting for 72.7% of deaths in 2011, with cardiovascular diseases being the most prevalent (30.4%).¹ Among the main risk factors for NCDs stand out overweight and obesity². And in this scenario, according to data from Brazilian government Surveillance of Risk Factors and Protection for Chronic Diseases by Telephone Inquiry (*Vigilância de Fatores de Risco e Proteção para Doenças Crônicas por Inquérito Telefônico* – VIGITEL), 50.8% of the Brazilian population were overweight in the year of 2013 and 17.5% were considered obese.³ The same survey also revealed that 49% of the adult population of the Brazilian city of Vitória, ES, were overweight. And among these 16.1% were obese.

Regarding nutritional status diagnosis, the use of anthropometric indicators such as the Body Mass Index (BMI) and Waist Circumference (WC) is very common and recommended in population studies because of the simplicity and low cost of the methods.⁴ While BMI is widely used in the analysis of presence of overweight and obesity, WC, as an isolated measure, is an important predictor of visceral adipose tissue, where its direct relation with diseases of the cardiovascular system is well clarified.⁵

The relationship between an unbalanced diet, poor health habits and inadequate nutritional status is well established.⁶ Considering that people spend most of their time in the workplace and that food choices are defined according to time, practicality and food availability, job characteristics may influence the adoption of incorrect eating habits.⁷ Thus, workers are often subjected to a high calorie though practical diet, contributing to nutritional losses and the arousal of NCDs, as well as other comorbidities.⁸

In this context, one has sought to understand the relationships between work and workers' health, since pressures and demands imposed on employees, coupled with psychological characteristics and unhealthy lifestyles, may reflect on their physical and mental health.⁹ As an example, the professional category of police officers, considered a profession that stands out because of the high physical and mental exhaustion due to the intense workload and suffering.¹⁰

There are few studies in the literature investigating nutritional status and its associated factors for police officers. The majority of those which are available refer to the military police corps,^{11,12} which, in turn, present work particularities that are different from those of civil police, and does not investigate the influence of variables related to eating habits in this population's anthropometric profile.¹³

Therefore, seeking to contribute to fill the knowledge gap and in view of the dynamics of police service, the relevance of physical conditioning for the development of their activities and the significant importance for society of this professional category, the aim of this study was to evaluate anthropometric indicators and their associated factors in civil police officers in the Brazilian city of Vitória, ES.

Methodology

This is a quantitative, cross-sectional study based on sociodemographic, anthropometric, labor and eating habits data from a broader survey conducted from January to April 2014, entitled "Nutritional status, eating habits, cardiovascular risk and associated factors: a study about civil police officers in Vitória, ES." The study was submitted and approved by the Research Ethics Committee (REC) of the Brazilian federal university *Universidade Federal do Espírito Santo* (UFES) under number 20408013.8.0000.5060.

The study population consisted of civil police officers working in the Brazilian area of Greater Vitória with ages ranging from 25 to 65 years, of both genders. The sample size was calculated considering a total number of 1,225 police officers, with 95% confidence interval, 8% error, 50% prevalence of overweight, totaling a sample of 134 policemen. Participation in the study was made through signing an Informed Consent Form (ICF). Data collection was carried out at the workplace and employees were released from their duties at the interview time to respond to a

structured questionnaire containing sociodemographic, labor and eating habits questions and to be submitted to collection of anthropometric data by trained researchers. The criterion for inclusion in the research was being in full employment activity and excluding pregnant women, servants on vacation or retirees.

Regarding sociodemographic data, the socioeconomic class was determined by the Brazilian Criteria of Economic Classification (CCEB, in the Portuguese abbreviation).¹³ Individuals were categorized into two classes, A and B or C, D and E, in order to make up representative groups. The variable education was categorized into three groups: primary and secondary education, higher education and postgraduate education. Marital status was categorized into single, married/cohabiting and separated/divorced/widowed.

For the anthropometric evaluation, the following variables were included: body weight, height and waist circumference (WC). Body weight was measured using portable scale Tanita® digital model BC533 InnerScan with precision of 0.1 Kg and capacity of up to 150 Kg. Height was measured with stadiometer Sanny® with precision of 0.5 cm. And WC was measured with a 1-cm wide inelastic tape measure Sanny®. Criteria established by Waitzberg and Ferrini,¹⁴ Marfell-Jones¹⁵ and Cameron¹⁶ were used for measures of weight, height and WC, respectively.

Nutritional status classification was performed using the Body Mass Index ($BMI = \text{Weight}/\text{Height}^2$) recommended by (United Nations specialized agency) World Health Organization (WHO).¹⁷ This variable was categorized as $BMI < 25 \text{ kg/m}^2$ [normal (healthy weight)] and $BMI \geq 25 \text{ kg/m}^2$ (overweight).

As for waist circumference, cut-off points recommended by the National Cholesterol Education Program – Adult Treatment Panel III (NCEP – ATP-III) were adopted.¹⁸ In this way, individuals with waist circumferences greater than or equal to 102 cm for men and greater than or equal to 88 cm for women were classified as having a high cardiovascular risk.

With regard to job characteristics, the following categories were determined: position/function currently performed, time as a police officers, considering the work stressful, considering themselves valued professionals and feeling fulfillment in their work. The variable professional position was categorized into agent, chief of police/desk sergeant, detective and others. The variable time as a police officer was categorized in up to 2 years, between 2 and 10 years and over 10 years. On the other hand, variables “considering work stressful,” “considering themselves valued professionals” and “feeling fulfillment in their work” were categorized as “yes” and “no.”

Interviewees were asked about the following eating habits: where they eat, how often they eat breakfast outside their homes, motivation for composing dishes, consumption of fried foods, habit of using complete seasoning and volume of water ingested daily.

The theoretical model used in this study is presented in Figure 1.

BLOCK 1

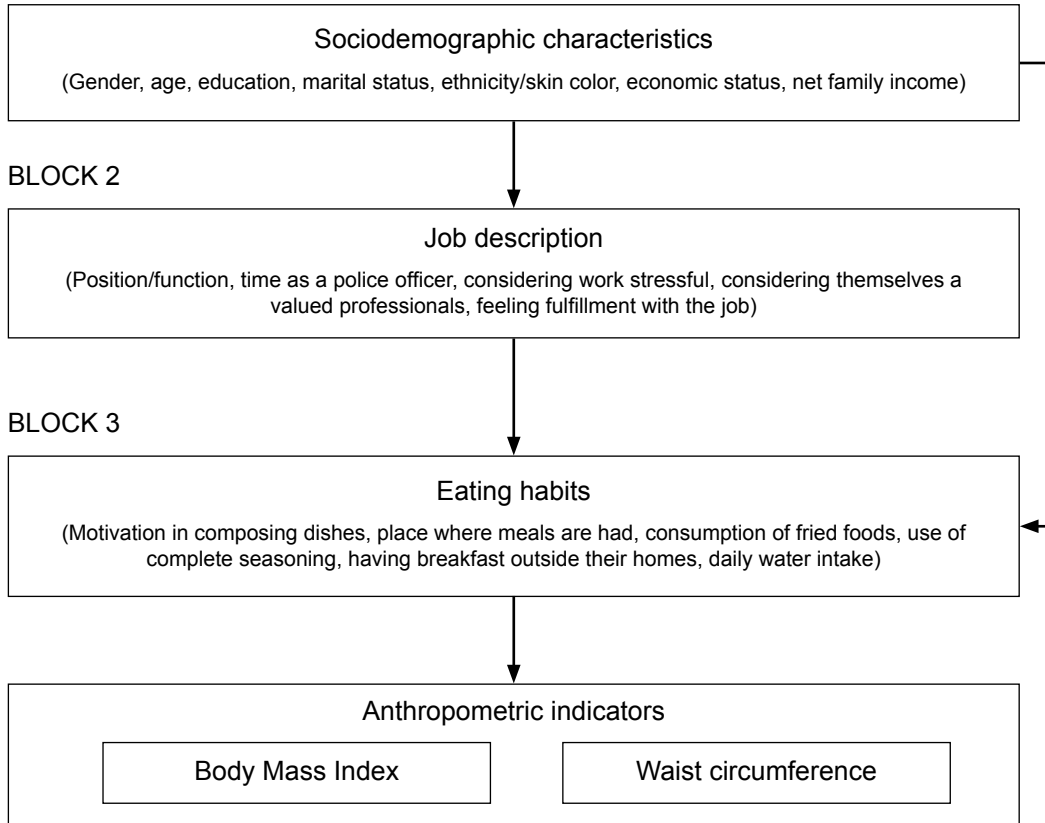


Figure 1. Hierarchical theoretical model of possible relationships among sociodemographic variables, work characteristics, eating habits and anthropometric indicators for civil police officers. Vitória, ES, Brazil, 2014-2015.

To describe the study variables, central tendency measures (mean and median) were used. And for continuous variables, measures of statistical dispersion [standard deviations (SD) and standard error of the mean (SEM)] and percentages for categorical variables. For the analysis of the differences in proportions, the chi-squared test (X^2) was used. The level of significance was established in $\alpha 0.05$. In the cases of statistical significance up to 20% in the chi-squared test, the odds ratio adjusted by the multivariate logistic regression model was calculated, considering as standard the category of eutrophy for BMI and adequate waist circumference. Calculation of adjusted odds ratio was estimated for categories gender, age, economic status, position/function, time as a police officer, considering work stressful, motivation in composing dishes, habit of having

breakfast outside their homes and volume of water ingested daily. Statistical analyses were carried out with the (software package) SPSS Statistics for Windows version 18.0.

Results

Of the 134 police officers randomly selected, 133 completed the study. Sociodemographic and anthropometric characterizations of the population studied revealed that of the 133 police officers, 70.7% (n = 94) were males, 88.7% (n = 118) of the sample belonged to economic classes C, D or E and 80.5% (n = 107) of the population had a net family income above BRL 5,000.00. The majority of the patients evaluated was over 40 years of age (70.8%, n = 92) and the mean age was 44.27 ± 9.87 years. Regarding marital status, it was observed that the majority (65.2%, n = 86) was married or cohabiting. Regarding education, a high level was observed among police officers, since 58% (n = 76) had a complete high education/university degrees and 23.7% (n = 31) had a postgraduation degree.

The anthropometric evaluation revealed that 64.3% (n = 83) of the police officers were overweight, mean BMI being 26.91 ± 4.36 Kg/m² (19.36 - 45.20 Kg/m²). In turn, analysis of WC found 21.1% (n = 27) of police officers with numbers above what is considered appropriate and the mean found was 89.33 ± 12.01 cm.

An association between anthropometric indicators and socio-demographic and labor variables was observed (Table 1). Variables gender (p = 0.0010), time as police officers (p = 0.036) and considering the work stressful (p = 0.001) were presented as associated to BMI. Regarding gender, males presented higher prevalence of overweight (83.1%, n = 69) when compared to females. Regarding labor variables, it was observed that the longer the work time, the greater the occurrence of excess weight, which is more prevalent among individuals with more than 10 years of profession (57.8%, n = 48). Professionals who considered work stressful also revealed higher prevalences of overweight (87.8%, n = 72) when compared to those who did not consider work stressful (58.7%, n = 27). Regarding waist circumference, only the variable age group showed a significant association. Police officers aged 40 years or older had the highest waist circumference when compared to police officers under the age of 40 (93.3%, n = 26).

The same indicators were associated with the variables related to police officers' eating habits (Table 2). Regarding BMI, associations were observed in motivation in composing dishes (p = 0.013), habit of having breakfast outside their homes (p = 0.035) and volume of water ingested daily (p = 0.041). WC was not associated with the dietary habits investigated. Those individuals who were motivated by the taste of the meal presented higher prevalences of overweight (55.4%, n = 46), according to BMI, when compared to those who were motivated by the presence of healthy food (44.6%, n = 37). Likewise, police officers who habitually had breakfast outside their homes

more than 4 times a week presented higher prevalences of overweight when compared to those who would have it at home (20.5%, n = 17). Lower prevalences of overweight were observed in those subjects who consumed 2 liters or more of water per day compared to those consuming lower amounts (62.2%, n = 31).

Table 1. Indicators of Nutritional Status and its associations with variables related to sociodemographic and work variables for civil police officers in Greater Vitória, ES, Brazil, 2014-2015.

Variables	Body Mass Index				Waist circumference			
	TOTAL n (%) ^a	Not overweight n (%)	Overweight n (%)	p-value ^b	TOTAL n (%) ^a	Adequate n (%)	High n (%)	p-value ^b
Gender								
Female	37 (28.5)	23 (48.9)	14 (16.9)	0.000 ^c	37 (28.7)	27 (26.5)	10 (37.0)	0.280
Male	93 (71.5)	24 (51.1)	69 (83.1)		92 (71.3)	75 (73.5)	17 (63.0)	
Age group								
≤ 40 years	37 (28.7)	18 (39.1)	19 (22.9)	0.051	37 (28.9)	36 (35.6)	1 (3.7)	0.001***
> 40 years	92 (71.3)	28 (60.9)	64 (77.1)		91 (71.1)	65 (64.4)	26 (93.3)	
Classification (ABEP)								
A and B	15 (11.5)	3 (6.4)	12 (14.5)	0.166	15 (11.6)	11 (10.8)	4 (14.8)	0.561
C, D and E	115 (88.5)	44 (93.6)	71 (85.5)		114 (88.4)	91 (89.2)	23 (85.2)	
Ethnicity/skin color								
White	61 (47.3)	22 (47.8)	39 (47.0)	0.927	61 (47.7)	48 (47.5)	13 (48.1)	0.954
Nonwhite	68 (52.7)	24 (52.2)	44 (53.0)		67 (52.3)	43 (52.5)	14 (51.9)	
Education								
1 st and 2 nd degrees	22 (16.9)	5 (10.6)	17 (20.5)	0.489	21 (16.3)	13 (12.7)	8 (29.6)	0.125
College education	73 (56.2)	29 (61.7)	44 (53)		73 (56.6)	61 (59.8)	12 (44.4)	
Postgraduation degree	31 (23.8)	12 (25.5)	19 (22.9)		31 (24)	24 (23.5)	7 (25.9)	
No information	4 (3.1)	1 (2.1)	3 (3.6)		4 (3.1)	4 (3.9)	0 (0.0)	
Marital status								
Single	31 (24.0)	14 (30.5)	17 (20.5)	0.209	31 (24.2)	27 (26.7)	4 (14.8)	0.300
Married/cohabiting	85 (65.9)	26 (56.5)	59 (71.1)		85 (66.4)	66 (65.3)	19 (71.4)	
Divorced/widowed	13 (10.1)	6 (13.0)	7 (8.4)		12 (9.4)	8 (7.9)	4 (14.8)	

Variables	Body Mass Index				Waist circumference			
	TOTAL n (%) ^a	Not overweight n (%)	Overweight n (%)	p-value ^b	TOTAL n (%) ^a	Adequate n (%)	High n (%)	p-value ^b
Family income								
≤ BRL 5,000	25 (19.2)	11 (23.9)	13 (15.7)	0.247	24 (18.8)	21 (20.8)	3 (11.1)	0.252
> BRL 5,000	105 (80.8)	35 (76.1)	70 (84.3)		104 (81.2)	80 (79.2)	24 (88.9)	
Position/function								
Detective	61 (46.0)	16 (34.0)	45 (54.2)	0.172	60 (46.5)	44 (43.1)	16 (59.3)	0.330
Chief of police/desk sergeant	11 (8.5)	5 (10.6)	6 (7.2)		11 (8.5)	8 (7.8)	3 (11.1)	
Police agent	19 (14.6)	8 (17.0)	11 (13.3)		19 (14.7)	17 (16.7)	2 (7.4)	
Other	39 (20.0)	18 (38.3)	21 (25.3)		39 (30.3)	33 (32.4)	6 (22.2)	
Time as a police officer								
< 2 years	28 (21.5)	16 (34.0)	12 (14.5)	0.036 ^c	28 (21.7)	26 (25.5)	2 (7.4)	0.09
2-10 years	34 (26.2)	11 (23.4)	23 (27.7)		34 (26.4)	30 (29.4)	4 (14.8)	
> 10 years	68 (52.3)	20 (42.6)	48 (57.8)		67 (51.9)	46 (45.1)	21 (77.8)	
Considers work stressful								
Yes	99 (77.5)	27 (58.7)	72 (87.8)	0.001 ^c	99 (78.0)	48 (76.2)	51 (79.7)	0.635
No	29 (22.5)	19 (41.3)	10 (12.2)		28 (22.0)	15 (23.8)	13 (20.3)	
Consider that they are a valued professional								
Yes	51 (39.8)	20 (43.5)	31 (37.8)	0.529	51 (40.2)	42 (42.0)	9 (33.3)	0.415
No	77 (60.2)	26 (56.5)	51 (62.2)		76 (59.8)	58 (58.0)	18 (66.7)	
Feeling fulfillment with their work								
Yes	94 (73.4)	33 (71.7)	61 (74.4)	0.792	93 (73.2)	72 (72.0)	21 (77.8)	0.547
No	34 (26.6)	13 (28.3)	21 (25.6)		34 (26.8)	28 (28.0)	6 (22.2)	

^a Total of individuals equal to 130; different values indicate loss of data.

^b Chi-squared test

^c $p < 0.05$

Table 2. Indicators of Nutritional Status and its associations with variables related to eating habits for civil police officers in Greater Vitória, ES, Brazil, 2014-2015.

Variables	Body Mass Index				Waist circumference			
	Total*	Not overweight	Overweight	p-value ^b	Total ^a	Adequate	High	p-value ^b
	n (%)	n (%)	n (%)		n (%)	n (%)	n (%)	
Motivation in composing dishes								
Taste	61 (47.3)	15 (32.6)	46 (55.4)	0.013 ^c	61 (47.7)	46 (45.5)	15 (55.6)	0.355
Healthy food	68 (52.7)	31 (67.4)	37 (44.6)		67 (53.3)	55 (54.5)	12 (44.4)	
Place where they eat								
At home	63 (48.8)	25 (54.3)	38 (45.8)	0.351	63 (49.2)	52 (51.5)	11 (40.7)	0.321
Outside the house	66 (51.2)	21 (45.7)	45 (54.2)		65 (50.8)	49 (48.5)	16 (59.3)	
Consumption of fried foods								
Yes	85 (66.4)	30 (65.2)	55 (67.1)	0.831	43 (33.9)	32 (32.0)	11 (40.7)	0.394
No	43 (33.6)	16 (34.8)	27 (32.9)		84 (66.1)	68 (68.0)	15 (59.2)	
Use of complete seasonings								
Yes	29 (77.5)	9 (19.6)	20 (24.1)	0.555	29 (22.7)	24 (23.8)	5 (18.5)	0.563
No	100 (22.5)	37 (80.4)	63 (75.9)		99 (77.3)	77 (76.2)	22 (81.5)	
Having breakfast outside their homes								
1-4 times a week	16 (12.4)	9 (19.6)	7 (8.4)	0.035 ^c	16 (12.5)	13 (12.9)	3 (11.1)	0.252
> 4 times a week	20 (15.5)	3 (6.5)	17 (20.5)		20 (15.6)	13 (12.9)	7 (25.9)	
Never/almost never	93 (72.1)	34 (73.9)	59 (63.4)		92 (71.9)	75 (74.3)	17 (63.0)	
Volume of water ingested daily								
Less than 2 L	71 (55.5)	20 (43.5)	51 (62.2)	0.041 ^c	70 (55.1)	56 (56.0)	14 (51.9)	0.701
2 L or more	57 (44.5)	26 (56.5)	31 (37.8)		57 (44.9)	44 (44.0)	13 (48.1)	

^a Total of individuals equal to 130; different values indicate loss of data.

^b Chi-squared test

^c $p < 0.05$

After the logistic regression analyses (Table 3), the variables gender ($p = 0.007$), socioeconomic class ($p = 0.032$) and stressful work ($p = 0.000$) were observed to be associated with BMI and habit of having breakfast outside their homes ($p = 0.015$). In turn, only the age group was associated with waist circumference ($p = 0.010$).

In the group of sociodemographic variables, being males (Odds 5.23; BMI 1.57-17.42) and belonging to economic classes A and B (Odds 8.18; BMI 1.20-55.86) increased the chances of the individual having an inadequate BMI. Regarding waist circumference, being over 40 years of age increased the chances of having high WC by 14.4 times (BMI 1.88-110.57). Regarding labor variables, considering the work stressful increased by 11.17 times the chance of having an inadequate BMI (BMI 3.09-40.36). As for eating habits, police officers who would have breakfast more than 4 times a week presented a 10.68-fold higher chance of having an inadequate BMI (BMI 1.57-72.67).

Table 3. Socio-demographic factors, work characteristics and eating habits associated with nutritional status indicators, from the adjusted Odds Ratio, considering appropriate the Body Mass Index and Waist Circumference categories as a standard for civil police officers in Greater Vitória, ES, Brazil, 2014-2015.

Group	Variables	Body Mass Index								
		Chi-square		Gross Odds Ratio			Adjusted Odds Ratio (a)			
		p-value	p-value	OR	LL 95%	UL 95%	p-value	OR	LL 95%	UL 95%
1	Males	0.001	0.001	4.72	2.10	10.62	0.007	5.23	1.57	17.42
	Age group over 40 years	0.051	0.053	2.17	0.99	4.74	0.889	0.88	0.15	5.13
	Economic status classification A and B	0.166	0.178	2.48	0.66	9.28	0.032	8.18	1.20	55.86
2	Position/function Detective	0.172	0.042	2.41	1.03	5.64	0.964	0.97	0.25	3.77
	Time as a police officer over 10 years	0.036	0.012	3.20	1.29	7.97	0.099	3.32	0.80	13.81
	Considers work stressful	0.001	0.000	5.07	2.09	12.27	0.000	11.17	3.09	40.36
3	Motivation in composing dishes, taste	0.060	0.062	2.02	0.97	4.23	0.081	a	a	a
	Having breakfast outside their homes > 4 times a week	0.035	0.074	3.27	0.89	11.96	0.015	10.68	1.57	72.67
	Volume of water ingested daily	0.041	0.042	2.14	1.03	4.46	0.235	a	a	a
Group	Variables	Waist circumference								
		Chi-square		Gross Odds Ratio			Adjusted Odds Ratio (a)			
		p-value	p-value	OR	LL 95%	UL 95%	p-value	OR	LL 95%	UL 95%
1	Age group over 40 years	0.001	0.010	14.40	1.88	110.57	0.010	14.40	1.88	110.57
2	Time as a police officer over 10 years	0.090	0.022	5.93	1.29	27.35	0.273	a	a	a

Logistic regression model, hierarchical (according to the groups), adjusted by the forward likelihood ratio method.

a: Variables from the model by the method of variable adjustment.

Discussion

The present study has evidenced a high prevalence of overweight among civil police officers evaluated (64.3%; n = 83). In addition, it has identified that being males (OR 5.23; BMI 1.57-17.42), belonging to a higher socioeconomic class (A and B) (OR 8.18; BMI 1.20–55.86), considering the work stressful (OR 11.17, BMI 3.09-40.36) and having breakfast outside their homes (OR 10.68, BMI 1.57-72.67) are risk factors for increased BMI. And belonging to the age group above 40 years is a factor for high waist circumference (OR 14.40, BMI 1.88-110.57).

These results reinforce the close relationship among sociodemographic, occupational and eating habits and body weight variables. In addition, they show that weight excess is also high in professional categories considered physically active and in which physical conditioning is important for job performance.¹⁹

A high number of professionals with excess weight (64.3%) is well above the estimated average in 2014 for the Brazilian population by the Brazilian government Surveillance of Risk Factors and Protection for Chronic Diseases by Telephone Inquiry (*Vigilância de Fatores de Risco e Proteção para Doenças Crônicas por Inquérito Telefônico – VIGITEL*) (52.8%) and the population in Vitória, ES (51%).³ This reality was also found in studies evaluating civil and military police officers^{10, 20-22} in different Brazilian states, where overweight rates equal to or higher than 60% were found in the population investigated. Considering the greater physical requirements to which this category is exposed and the need for physical conditioning to perform some activities, a lower prevalence of overweight was expected in this population.

It is possible to suppose that the high rate of overweight observed among police officers is related to the practice of insufficient physical activity due to the peculiar characteristic of the profession and its reflexes on their personal life, exposed to precarious conditions of work, emotional overload, reversal of sleep schedules and excessive overtime, which make them use their leisure time to rest, having leisure activities with less energy expenditure.²³

The percentage of overweight was higher among males. A study with 34 individuals, adults and elderly men and women in the Brazilian city of Belém, PA, corroborates the finding, since 90.0% of men and 64.3% of women were found to be overweight and obese according to BMI.²¹ Thus, an important national survey indicates evolution of anthropometric profile in Brazil, evidencing the increase in prevalence of overweight among men in all major regions of the country.²⁴ The predominance of male police officers in the overweight range may be justified by the constant female concern about aesthetic issues, their greater perception of health risks and the development of eating habits that are normally healthier than men's.²¹ It should be emphasized that overweight represents health damage due to the strong relation with cardiovascular diseases, diabetes, dyslipidemias, high mortality² and consequent impairment of quality of life in this group

of servants. In addition, obesity can reduce these professionals' mobility, their physical fitness and performance required to perform combat activities and make it difficult to use ballistic vests, holsters and uniforms, which in turn may risk their health and safety.

It should be considered that men tend to have a higher proportion of abdominal fat, giving them the so-called male or android pattern of body fat distribution. Women, in turn, have a greater amount of fat in the gluteal region, presenting the female or gynoid pattern.²⁵ Despite this, gender was not associated with waist circumference in the present investigation.

The prevalence of overweight and obesity increases with age, reaching a higher value in the age group from 45 to 54 years.²⁶ Age is an additional factor for the development of health problems and the so-called "early functional aging," which can reach workers still in productive ages.²⁷ However, only waist circumference was shown to be associated with the age group in this study.

The association between an inappropriate BMI and high economic class was also observed by other researchers involving other population groups.^{28,29} It was considered that individuals of low socioeconomic class would present natural protection against excess weight, since this group would tend to have less food availability, lower energy consumption and greater intensity of physical activity related to occupation.^{28,30} However, when analyzing the prevalence of overweight among developed countries and therefore higher income when compared to developing countries, it is found that overweight is not associated with per capita income in the country, considering that, although the United States still has the highest percentage of overweight, countries like Mexico, Chile and Turkey are among those with the highest percentage of obesity according to data presented by the Organization for Economic Co-operation and Development (OCDE).³¹

In the sample studied, the higher risk of classes A and B police officers having an inadequate BMI may be related to predominantly administrative functions that higher remuneration positions present, which would lead to lower energy expenditure due to the execution of these activities when compared to those of combat.

Regarding education, different from the data of the present study, health complications in police officers were associated with low education.^{10,32} Nevertheless, studies have shown that the low level of knowledge in nutrition is associated with nutritional deviations in low-income populations.³³ And the level of education has been identified as a variable capable of interfering with the way the population chooses its food, which may be decisive for the quality of self-care and the capacity to interpret information related to health protection.³⁴ According to Teichmann and collaborators,³⁵ this association can be attributed, in part, to the effects of poor information available for the low-educated population, the adoption of a less healthy lifestyle and a consequent increase in the consumption of low-cost, high-energy foods. Thus, it is believed that education can influence knowledge about food and nutrition, which, in turn, is related to the individuals' nutritional status.³⁶

Age had an important relation with nutritional status, with a higher prevalence of inadequate WC among police officers over 40 years of age. Studies show that, over the years, individuals lose a large amount of lean body mass and accumulate more body fat percentage (BFP), mainly in the abdominal region, leading to an increased risk of several pathologies, including arterial hypertension and cardiovascular diseases.³⁷

The civil police profession is considered to be stressful, given the need for continuous contact between agents and society in the development of the function, since they perform their job in a conflictive environment, at the limit of marginality and criminality.³⁸ Thus, the present study confirms what is found in the literature, since, together with professional stress, the sedentary lifestyle promotes the growth of obesity and overweight rates in this group, which follows the national profile.^{3,39}

In obese individuals there is a strong tendency to increase the physiological activation induced by stress, which is manifested in the presence of environmental challenges, such as chronic occupational stress.⁴⁰ In addition, obese people have the habit of eating very quickly in replacement of work irritability, besides eating more when stressed.⁴¹

Risk related to work stress reinforces evidence that this variable can trigger psychological manifestations such as depression and anxiety. It is believed that anxiety would be linked to a greater caloric intake, which may in some cases lead to binge eating, which is extremely related to the beginning of the process of increasing body mass index (BMI).⁴²

Nowadays, the number of Brazilians who eat their meals outside their homes has increased.³⁹ Among such meals, breakfast. The greater opportunity for police officers having breakfast outside their homes on most days of the week presenting an inadequate BMI may be due to the higher energy density of the preparations offered outside their homes – and among them breakfast – which are generally richer in total fats, saturated fats and sugars and are poor in micronutrients.⁴³

In this sense, corroborating the finding, it was observed that this type of diet is associated with a higher prevalence of overweight and a sedentary lifestyle.⁴⁴ In addition, overweight and obesity are higher in men who eat meals outside their homes (38.5% and 11.9%, respectively) when compared to those that do not (36.1% and 10.3%).⁴⁵ It is important to note that there are few studies evaluating the nutritional quality of these meals in Brazil.

According to waist circumference, a significant number of civil police officers with a high risk of metabolic and coronary complications associated with overweight and visceral fat was detected. A study conducted in the Brazilian state of Paraná has found a percentage of 12% (n = 22) of police officers in the same conditions.²² In the state of Rio Grande de Sul, in an investigation with 112 military police officers, 18.27% (n = 19) of the sample had excess fat in the abdominal region.²¹ These findings suggest that the high rates of overweight and high waist circumference observed

in the population evaluated are related to insufficient physical activity practices, inadequate eating habits and work stress.

The information obtained in this study may add to the Brazilian medical literature data on nutritional status, eating habits and sociodemographic and occupational characterization of civil police officers, which are currently poorly investigated and such investigation made available.

It should be emphasized that methodological limitations are common to studies carried out in police corporations around the world, and in Brazil this fact becomes more evident given restrictions on access to information and fear by corporations that the transfer of personal information would harm the interviewees.¹⁰ For this reason, information bias should be highlighted as a possible limitation for this article. Another limiting point in the study is its cross-sectional design, which makes it impossible to determine the temporal relationship between the variables studied. It is also emphasized that the answers to the questionnaire are self-referenced, which makes it possible to underestimate or overestimate the data. Moreover, as this research is carried out with a specific professional category, the generalization of results is restricted. Another limitation to be highlighted is that BMI was used as a parameter for weight assessment in this study. This parameter, in turn, does not differ between muscle mass and fat mass. For this reason, the percentage of excess weight found should be carefully analyzed. To minimize this limitation, WC was also used for an alternative parameter of anthropometric evaluation.

Final thoughts

From the present study, the importance of anthropometric evaluation in civil police officers is evidenced in order to identify possible factors associated to nutritional status inadequacy in this group of servants, allowing us to conclude that inadequacy of indicators about nutritional status is directly related to economic class, age, gender, labor stress and eating habits. Thus, this study provides data to support actions to promote health and quality of life in this work group.

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Received: February 7, 2016

Reviewed: June 27, 2016

Accepted: August 10, 2016