

# Obesity as risk factor associated with hypertension among nursing professionals of a national philanthropy health institution

OBESIDADE COMO FATOR DE RISCO PARA A HIPERTENSÃO ENTRE PROFISSIONAIS DE ENFERMAGEM DE UMA INSTITUIÇÃO FILANTRÓPICA

OBESIDAD COMO FACTOR DE RIESGO PARA LA HIPERTENSIÓN ENTRE PROFESIONALES DE ENFERMERÍA DE UNA INSTITUCIÓN FILANTRÓPICA

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## ABSTRACT

The present study analyzed the relationship between obesity and high blood pressure among nursing professionals of a philanthropic institution, with a view to the early detection of possible cases of hypertension. The study population consisted of 147 nursing professionals of ages between 20-70 years. The researcher performed structured, individual, interviews at the work site of those professionals, 91.8% of which were women; 29.2% were older than 40 years; 11.6% had a SBP $\geq$ 140mmHg and 6.8% DBP $\geq$ 90mmHg; 12.2% had obesity class I-II; 38.1% of women with a WHP $\geq$ 0.85, 12.2% in the age range of 40-49 years; 2.1% of men with a WHR $\geq$ 1.0, 1.4% in the age range of 40-49 years. It was found that, though nursing professionals know the severity of the disease and the importance of changing their life habits, they still find it difficult to adopt that behavior, which suggests the need to implement educational programs at the work site to help them to change their behaviors.

## KEY WORDS

Nursing.  
Obesity.  
Hypertension.  
Risk factors.  
Voluntary Health Agencies.

## RESUMO

Analisou-se a presença de obesidade relacionada com níveis de pressão alterados entre os profissionais de enfermagem de uma instituição filantrópica, tendo em vista a detecção precoce de possíveis hipertensos. A população constituiu-se de 147 profissionais de enfermagem com idade de 20-70 anos. Realizou-se entrevista estruturada, individual, pelo pesquisador no local de trabalho desses profissionais. 91,8% eram mulheres; 29,2% possuíam idade superior a 40 anos; 11,6% apresentaram PAS $\geq$ 140mmHg e 6,8% PAD $\geq$ 90mmHg; 12,2% apresentaram obesidade grau I-II; 38,1% das mulheres, RCQ $\geq$ 0,85, 12,2% com idade 40-49 anos; 2,1% dos homens apresentaram RCQ $\geq$ 1,0, 1,4% encontravam-se na faixa etária 40-49 anos. É possível identificar que, embora os profissionais de enfermagem conheçam a gravidade da doença e a importância da mudança nos hábitos de vida, ainda apresentam dificuldade para tal comportamento, o que sugere a necessidade de implementação de programas educativos no local de trabalho, de modo a contribuir e favorecer a mudança de comportamento destes profissionais.

## DESCRIPTORIOS

Enfermagem.  
Obesidade.  
Hipertensão.  
Fatores de risco.  
Instituições Filantrópicas de Saúde.

## RESUMEN

Se analizó la presencia de obesidad relacionada con niveles de presión alterados, entre los profesionales de enfermería de una institución filantrópica, con el propósito de observar la detección precoz de posibles hipertensos. La población estuvo constituida por 147 profesionales de enfermería con edades de entre 20 y 70 años. El investigador realizó una entrevista estructurada, individual en el local de trabajo de dichos profesionales; 91.8% eran mujeres; 29.2% tenían edad superior a 40 años; 11.6% fueron identificados con PAS $\geq$ 140mmHg, 6.8% con PAD $\geq$ 90mmHg; 12.2% presentaron obesidad de grado I-II; 38.1% de las mujeres, RCQ $\geq$  0.85, 12.2% con edad entre 40-49 años; 2.1% de los hombres presentaron RCQ $\geq$ 1.0, 1.4% se encontraban en la faja etaria de 40-49 años. Es posible identificar que a pesar de que los profesionales de enfermería conocen la gravedad de la enfermedad y la importancia de cambios en los hábitos de vida, aún muestran dificultad para adoptar tal comportamiento, lo que sugiere la necesidad de la implementación de programas educativos en los locales de trabajo con el objeto de facilitar cambios en el comportamiento de estos profesionales.

## DESCRIPTORES

Enfermería.  
Obesidad.  
Hipertensión.  
Factores de riesgo.  
Agencias Voluntarias de Salud

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## INTRODUCTION

Systemic Arterial Hypertension (SAH) refers to the chronic increase of systolic blood pressure (SBP) or diastolic blood pressure (DBP). The diagnosis for SAH can only be established when at least three measurements are performed, with an one-week interval between them, and if SBP values above 140 mmHg or DBP values above 90 mmHg are identified, considering adult individuals older than 18 years. When it is identified that the SBP is equal to or greater than 210 mmHg or DBP equal to or greater than 120 mmHg, more than one measure is necessary to implement the treatment<sup>(1)</sup>.

Increases in weight and waist circumference (WC) are important prognostic indexes for SAH, as central obesity is an important indicator of cardiovascular risk; 75% of men and 65% of women present SAH directly attributed to overweight and obesity<sup>(2)</sup>.

The Body Mass Index (BMI) is obtained by dividing the weight, in kilograms, by the height, in square meters. The WC can be measured from the mean point between the iliac crest and the lowest rib and the hip circumference (HC) is usually measured at the height of the femoral trochanters, with waist-hip ratio values (WHR) above 0.85 for women and above 1.0 for men<sup>(3)</sup>.

Regardless of the degree of overweight, excessive abdominal fat can be evaluated using the WHR, and it is an important risk factor for several non-infectious chronic diseases<sup>(4)</sup>. The BMI together with age and gender are considered the variables that most affect body fat distribution.

The risk of developing chronic-degenerative diseases, such as cardiovascular disease, SAH, diabetes mellitus (DM) and dyslipidemia appears to increase progressively when the BMI achieves levels above 25 kg/m<sup>2</sup>, and with WC above 94 cm for men and above 80 cm for women<sup>(3-5)</sup>.

Fat intake in individuals with SAH should be reduced, because the complications may increase, such as coronary artery disease (CAD), besides the fact that obesity, alone, increases tension values.

## OBJECTIVE

To analyze the presence of obesity associated with altered blood pressure levels among the nursing workers of a philanthropy institution, in view of early detection of possible hypertension cases.

## METHOD

This is a descriptive study, which used a quantitative approach, performed with nursing workers (nurses, nurs-

ing technicians and aides) of a philanthropy institution located in the interior of São Paulo state.

The study population consisted of nursing workers of both genders and with ages ranging between 20 and 70 years, who performed everyday activities and agreed to participate in the study by signing the Free and Informed Consent Form, after it being approved by the Research Ethics Committee at Ribeirão Preto College of Nursing, University of São Paulo (EERP/USP) (Document number 0494/2004).

Data were collected by means of structured interviews, according to the instrument used by Simão, which includes data regarding the *Health Field* model<sup>(6-7)</sup>.

The data collection instrument includes items of *human biology*, which comprises data regarding their identification, anthropometric data (weight, height, blood pressure values) and family background; *environment*, including data regarding the individual's education, professional practice, family structure; *life style*, which refers to aspects concerning exercising, eating habits, smoking, consumption of alcoholic beverages, etc; *health service organization*, which comprises the information regarding the use of health services, treatments for diseases and use of medications.

Blood pressure (BP) values were identified by using the indirect method, using cuffs with a rubber bag, with width that was compatible with the mid-upper arm circumference of individuals<sup>(8-9)</sup>. Data analysis was performed considering the BP value obtained from the mean value from the two measurements.

The BMI together with age and gender are considered the variables that most affect body fat distribution.

## RESULTS AND DISCUSSION

There were 147 participants in the study, all selected at random. Of the participants, 135 (91.8%) were women and 12 (8.2%) were men, of ages between 20 and 70 years (average 34.0 years).

Besides the age, we observed the body weight of the population, which ranged from 45 to 130 Kg, with an average of 87.5 Kg. As for their height, it ranged between 156 and 192 cm, with an average of 174 cm.

Collecting data regarding weight and height was helpful in investigating the presence of obesity among the interviewees, as it is considered a risk factor for cardiovascular diseases (CVD).

Excessive body weight in the abdominal region, evidenced by a WHR above 0.80 in women and 0.90 in men, means a greater risk for SAH, dyslipidemia, DM and mortality by CVD<sup>(10)</sup>.

In the present study it was identified that 79 (53.8%) women had a WHR < 0.85, and 56 (38.1%) had a WHR ≥ 0.85.

It is important to highlight that 18 (12.2%) women were in the age range between 40 - 49 years and with a WHR  $\geq 0.85$ . As for the men, 9 (6.1%) had a WHR  $< 1.0$  and 3 (2.1%) had a WHR  $\geq 1.0$ . In the age range between 40 - 49 years, 2 (1.4%) men had a WHR  $\geq 1.0$ . Women are more susceptible to developing SAH, as the WHR has been indicated as an important risk factor for several chronic non-infectious diseases<sup>(4)</sup>.

Previous studies found that obesity was more common among women with elevated WC and WHR<sup>(11, 12-13)</sup>.

Table 1 shows that 57 (38.7%) women had a WHR  $\geq 0.85$ , eight (5.4%) of whom had SBP  $\geq 140$  mmHg; three (2.1%) men had a WHR  $\geq 1.0$ , and one (0.7%) of them had SBP  $>180$  mmHg.

**Table 1** - Distribution of health workers from a Philanthropy Institution according to the WHR and SBP values - Sertãozinho - 2006

WHR	SBP (mmHg)										Total	%		
	Great		Normal		Borderline		SAH stage 1		SAH stage 2				SAH stage 3	
	<120	%	<130	%	130-139	%	140-159	%	160-179	%			>180	%
<b>Men</b>														
$\geq 1.0$	-	-	1	0.7	1	0.7	-	-	-	-	1	0.7	3	2.1
$< 1.0$	2	1.4	3	2.0	4	2.7	-	-	-	-	-	-	9	6.1
<b>Women</b>														
$\geq 0.85$	26	17.7	11	7.5	12	8.2	3	2.0	3	2.0	2	1.4	57	38.7
$< 0.85$	57	38.7	7	4.8	8	5.4	4	2.7	2	1.4	-	-	78	53.1
<b>Total</b>	<b>85</b>	<b>57.8</b>	<b>22</b>	<b>15.0</b>	<b>26</b>	<b>17.7</b>	<b>7</b>	<b>4.7</b>	<b>5</b>	<b>3.4</b>	<b>3</b>	<b>2.1</b>	<b>147</b>	<b>100</b>

It is observed, in Table 2, that 53 (36.0%) women had a WHR  $\geq 0.85$ , nine (6.1%) of whom had DBP  $\geq 90$  mmHg;

three (2.1%) men had a WHR  $\geq 1.0$ , two (1.4%) of whom had DBP  $\geq 90$  mmHg.

**Table 2** - Distribution of health workers from a Philanthropy Institution according to the WHR and DBP values - Sertãozinho - 2006

WHR	PAD (mmHg)										Total	%		
	Great		Normal		Borderline		SAH stage 1		SAH stage 2				SAH stage 3	
	<80	%	<85	%	85-89	%	90-99	%	100-109	%			>110	%
<b>Men</b>														
$\geq 1.0$	-	-	1	0.7	1	0.7	-	-	-	-	1	0.7	3	2.1
$< 1.0$	5	3.4	4	2.7	-	-	-	-	-	-	-	-	9	6.1
<b>Women</b>														
$\geq 0.85$	27	18.4	10	6.8	7	4.8	5	3.4	2	1.4	2	1.4	53	36.0
$< 0.85$	60	40.8	11	7.5	5	3.4	6	4.0	-	-	-	-	82	55.8
<b>Total</b>	<b>92</b>	<b>62.6</b>	<b>26</b>	<b>17.7</b>	<b>12</b>	<b>8.1</b>	<b>12</b>	<b>8.1</b>	<b>3</b>	<b>2.1</b>	<b>2</b>	<b>1.4</b>	<b>147</b>	<b>100</b>

The waist and hip circumference measurements are usually the values used to characterize the accumulation of abdominal fat, by means of the WC and the WHR.

The WHR has shown correlation with several diseases, especially those characterized by the metabolic syndrome<sup>(14)</sup>.

According to the data on Table 3, it is identified that 86 (58.5%) workers had normal weight, followed by 22 (15.0%) who were overweight, 17 (11.6%) had mild obesity, 19 (12.9%) moderate obesity and 3 (2.0%) with severe obesity. The age group between 40 - 49 years was that with the greatest number of workers (18.3%) with BMI  $\geq 25$  Kg/m<sup>2</sup>.

**Table 3** - Distribution of health workers from a Philanthropy Institution according to their age in years, by age group, and BMI - Sertãozinho - 2006

Age (years)	Body Mass Index ( Kg/m <sup>2</sup> )										Total	%
	< 25	%	25 - 27.4	%	27.5 - 29.9	%	30 - 39.9	%	$\geq 40$	%		
20 - 29	42	28.6	4	2.7	3	2.0	2	1.4	-	-	51	34.7
30 - 39	21	14.3	3	2.0	4	2.7	5	3.4	1	0.7	34	23.1
40 - 49	16	10.9	11	7.5	8	5.4	6	4.0	2	1.4	43	29.2
50 - 59	6	4.0	3	2.0	-	-	3	2.0	-	-	12	8.2
$\geq 60$	1	0.7	1	0.7	2	1.4	3	2.0	-	-	7	4.8
<b>Total</b>	<b>86</b>	<b>58.5</b>	<b>22</b>	<b>15.0</b>	<b>17</b>	<b>11.6</b>	<b>19</b>	<b>12.9</b>	<b>3</b>	<b>2.0</b>	<b>147</b>	<b>100</b>

Obesity is often associated with insulin resistance, and can cause glucose intolerance and type 2 diabetes, thus considerably increasing the risk to cardiovascular diseases. Weight reduction by following a low-calorie diet, associated to exercising, increases the tolerance to glucose and sensitivity to insulin<sup>(2)</sup>.

It is estimated that there are, currently, 100 million of obese individuals in the world. The prevalence of obesity

among individuals with hypertension is considerably greater compared to individuals with normal blood pressure. Literature reports increases three to eight fold in the SAH in obese individuals<sup>(14)</sup>.

Table 4 shows that 61 (41.5%) workers had a BMI  $\geq 25$  Kg/ m<sup>2</sup>, 10 (6.9%) of whom had SBP  $\geq 140$  mmHg and 6 (4.2%) had moderate obesity.

**Table 4** - Distribution of health workers from a Philanthropy Institution according to the BMI and SBP values - Sertãozinho - 2006

BMI (Kg/ m <sup>2</sup> )	SBP (mmHg)												Total	%
	Great		Normal		Borderline		SAH stage 1		SAH stage 2		SAH stage 3			
	<120	%	<130	%	130-139	%	140-159	%	160-179	%	>180	%		
< 25	63	42.8	8	5.4	10	6.8	1	0.7	3	2.0	1	0.7	86	58.5
25 - 27.4	7	4.8	9	6.1	3	2.0	2	1.4	-	-	-	-	21	14.4
27.5 - 29.9	10	6.8	3	2.0	4	2.7	1	0.7	1	0.7	-	-	19	12.9
30 - 39.9	5	3.4	2	1.4	5	3.4	2	1.4	3	2.0	1	0.7	18	12.2
$\geq 40$	-	-	-	-	3	2.0	-	-	-	-	-	-	3	2.0
<b>Total</b>	<b>85</b>	<b>57.8</b>	<b>22</b>	<b>14.9</b>	<b>25</b>	<b>16.9</b>	<b>6</b>	<b>4.2</b>	<b>7</b>	<b>4.8</b>	<b>2</b>	<b>1.4</b>	<b>147</b>	<b>100</b>

Regarding DBP, the data on Table 5 show that among the workers with BMI  $\geq 25$  Kg/ m<sup>2</sup>, 5 (3.4%) of them had

DBP  $\geq 90$  mmHg, and most had a BMI between 30 and 39.9 Kg/ m<sup>2</sup> characterizing moderate obesity.

**Table 5** - Distribution of health workers from a Philanthropy Institution according to the BMI and DBP values - Sertãozinho - 2006

BMI (Kg/ m <sup>2</sup> )	DBP (mmHg)												Total	%
	Great		Normal		Borderline		SAH stage 1		SAH stage 2		SAH stage 3			
	<80	%	<85	%	85-89	%	90-99	%	100-109	%	>110	%		
< 25	63	42.8	15	10.2	5	3.4	1	0.7	1	0.7	1	0.7	86	58.5
25 - 27.4	11	7.5	8	5.4	1	0.7	1	0.7	-	-	-	-	21	14.4
27.5 - 29.9	12	8.2	4	2.7	3	2.0	-	-	-	-	-	-	19	12.9
30 - 39.9	6	4.0	5	3.4	4	2.7	1	0.7	1	0.7	1	0.7	18	12.2
$\geq 40$	-	-	2	1.4	-	-	1	0.7	-	-	-	-	3	2.0
<b>Total</b>	<b>92</b>	<b>62.5</b>	<b>34</b>	<b>23.1</b>	<b>13</b>	<b>8.8</b>	<b>4</b>	<b>2.8</b>	<b>2</b>	<b>1.4</b>	<b>2</b>	<b>1.4</b>	<b>147</b>	<b>100</b>

A previous study found a positive association between elevated BMI and the prevalence of SAH<sup>(15)</sup>. Excessive body mass is a predisposing factor for hypertension, and may account for 20% to 30% of hypertension cases<sup>(9)</sup>.

It is important to stress that a great number of professionals work 6 to 12 hours/day, and that work overload eventually triggers several problems in their lives, including wrong eating habits, few hours of sleep, stress, lack of exercise, obesity, and other risk factors predisposing for diseases such as SAH and CVD.

Countries have different socioeconomic levels and risk factors, considering the particularities of each country; it is most likely that people from higher social classes in developed countries have a better control of their health, eating healthy foods, smoking less, and exercising, while the opposite probably occurs among the lower socioeconomic

levels, i.e., people eat more animal source foods, saturated fat, sugar and have less time to exercise<sup>(16)</sup>.

An important aspect concerning life style is exercise. However, in this study, it was observed that only 41 (27.9%) of the 147 interviewees did some kind of physical activity, including walking 20 (13.6%), 12 attending the gym (8.2%), playing soccer 4 (2.7%), swimming 3 (2.0%) and cycling 2 (1.4%), against 106 (72.1%) who reported they did not exercise at all. As for the frequency and duration of the physical activity, 14 (9.5%) workers reported they exercised less than three times a week for more than 45 minutes each time, and 11 (7.4%) exercised three times a week for more than 45 minutes each time; among the individuals who exercised regularly, 19 (12.9%) have exercised for less than one year, and 12 (8.2%) reported they have exercised for one to five years. These data clarify that few workers exercise regularly for over a year, indicating that this popula-

tion has a sedentary lifestyle, which is an important factor for the development of CVD and hypertension.

Exercises should be performed according to the age and health conditions of each individual, two or three days a week and with a duration of 45 to 60 minutes; to do this, patients should be encouraged and require a follow up system to achieve the expected results regarding BP control<sup>(17)</sup>.

Regular physical activity is very important and adds many benefits to life, including the reduction in CVD incidence, because in addition to reducing blood pressure and body weight, it also reduces the risk of developing hypertension in individuals with normal blood pressure<sup>(17)</sup>.

Having a sedentary life style is one of the main causes for maintaining a high body weight, and the latter can cause other serious problems. Exercising has a positive effect on the risks for cardiovascular diseases, on primary or complementary treatment of arteriosclerosis, on reducing lumbar pain, and on diabetes, in addition to having positive short term psychological effects (improved self-image, mood and self-esteem) as long term benefits (reduced anxiety, stress and depression)<sup>(18)</sup>.

It is observed that, among the individuals who exercised, 21 (14.1%) had BMI  $\geq 25$  Kg/m<sup>2</sup>, 9 (6.1%) of whom had class I obesity and 6 (4.0%) had class II obesity. On the other hand, among individuals who did not exercise, 40 (27.2%) had BMI  $\geq 25$  Kg/m<sup>2</sup>, 9 (6.1%) of whom had class I obesity, 12 (8.2%) had class II obesity, and 3 (2.0%) had class III obesity.

The influence of body fat distribution on the prevalence of SAH among obese individuals was confirmed by a 23.0% increase in individuals with overweight and 67.1% in individuals with class III obesity<sup>(19)</sup>.

As for WHR, 14 (9.5%) women with WHR = 0.85 exercised regularly and 42 (28.6%) did not exercise. Among the men, who are in smaller number in the institution, only 2 (1.4%) with WHR  $\geq 1.0$  did not exercise and of those with WHR < 1.0, 8 (5.4%) exercised and 2 (1.4%) did not.

The data above show that there are a great number of workers at the institution with elevated WHR values who do not exercise, particularly women, who are a majority in the institution.

When the SBP values of individuals who exercise are considered, it is observed that 5 (3.4%) workers had SBP  $\geq 140$  mmHg; Among the workers who did not exercise, 11 (7.4%) presented SBP  $\geq 140$  mmHg, 4 (2.7%) of whom had SBP between 140-159 mmHg, 6 (4.0%) had SBP between 160 – 179 mmHg, and 1 (0.7%) had SBP > 180 mmHg; it is also observed that among individuals with altered DBP values, 6 (4.1%) workers do not exercise, 4 (2.7%) of whom had DBP between 90 - 99 mmHg, 1 (0.7%) had DBP between 100 – 109 mmHg, and 1 (0.7%) had DBP > 110 mmHg.

Several studies have shown that exercising has a hypotensive effect in patients with hypertension, after a single

aerobics exercise session, and that the referred reduction in pressure levels is maintained during a physical training program<sup>(20)</sup>.

As for eating habits, 131 (89.1%) workers referred having a good appetite and that the food they eat on a daily basis include red meat, fried foods, pasta, vegetables, milk and coffee; as for their consumption of canned foods and cold meats, 36 (24.5%) workers denied consuming; 90 (61.2%) reported consuming only once/week, and 15 (10.2%) reported consuming 2 to 3 times/week; as for the consumption of fruits and vegetables, most workers reported a consumption of at least two to three times/week, while 13 (8.8%) reported they did not consume the referred foods; as for the use of saturated fat and oils in the preparation of foods, 47 (32.0%) workers reported they use once/week; 60 (40.8%) use 2 to 3 time/week; 24 (16.3%) workers use 4 to 6 times/week and 9 (6.1%) workers referred they did not use any type of fat in their food. Furthermore, also regarding the use of fat to prepare foods, 131 (89.1%) individuals reported they prepared their food exclusively with vegetable source fat; 15 (10.2%) with both animal and vegetable source fat, and only 1 (0.7%) with animal source fat.

The consumption of chocolate and its products was also reported as part of the workers' eating habits, with 3 (2.0%) reporting they did not consume any chocolate; 89 (60.6%) reported consuming at least once/week, and 48 (32.7%) workers reported they consumed between two to three times/week; as for the consumption of fibers present in bread, cereals and pasta most workers reported they consumed more than twice/week, and 45 (30.6%) workers stated they consumed on a daily basis; 39 (26.5%) workers reported they enjoyed salty foods against 108 (76.5%) workers who stated they did not enjoy salty foods; 45 (30.6%) workers mentioned they had the habit of taking a saltshaker to the table at meals.

For a meal to be healthy it should be sufficient, which implies the amount of food should cover the energetic needs of the body and maintain its balance; it should be complete, as it should provide all the necessary nutrients for the body to function properly, and they should be provided in appropriate, harmonic and adequate amounts.

## FINAL CONSIDERATIONS

The interest in studying the risk factors for hypertension disease among nursing workers emerged from observing, within this philanthropy institution where I work, the number of obese and sedentary individuals, besides the great number of medical certificates for cardiovascular problems.

The study was important, because most individuals with hypertension and likely to develop hypertension recognized they needed to take care of themselves and made changes to some of their habits, such as beginning to exercise, changing their eating habits, reduce their consumption of cigarettes and alcoholic beverages, and changed their sleeping habits.

Furthermore, they recognized it was easier for them to obtain faster treatment because they worked in the health area and had knowledge about the referred problem.

Nursing workers should consider that in the next three or four decades the current young adult population in Brazil will become the aged population in the country, with a potential for developing chronic diseases, many due to cardiovascular risk factors. Some of those diseases already act

silently, initiating a path that can affect the quality of life and the aging process of the population.

Health education is one of the main elements to improve the life conditions of individuals with CVD. The monitoring of risk factors performed by nursing workers is of utmost importance, as it helps to identify the aspect related to improving the health and life conditions for individuals who live with cardiovascular problems.

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