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Overweight and social determinants of health

Excesso de peso e determinantes sociais de saúde

Sobrepeso y determinantes sociales de salud

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Abstract

Objective: To analyze the social determinants of health associated with overweight and obesity in women. **Methods:** This was a cross-sectional study of women with a body mass index (BMI) ≥25 kg/m2 who were followed up at an obesity referral center in Salvador, Bahia. Secondary data from 161 medical records were used, which were organized into layers according to the Social Health Determinants model and analyzed using descriptive statistics and Fisher's Exact Test. **Results:** In DSS layer 1, there was a predominance of the 40-59 age group (84;52.2%) and brown race/color (93;57.8%). An association was found between BMI and age group (p=0.015). In layer 2, there was no diet (102; 63.4%), no physical activity (112; 69.6%) and alcohol consumption (63; 39.1%), with a significant association between BMI and alcohol consumption (p=0.045). In layer 3, less than 3 people lived in the household (63; 39.1%). As for layer 4, there was a predominance of women with a high school degree (89; 55.3%), an income of less than one minimum wage (79; 49.1%) with formal paid employment (69; 42.9%), and education showed an association with BMI (p=0.016). **Conclusion:** There was a significant association between BMI and age group in layer 1, with alcohol consumption in layer 2 and with education level in layer 4 of the DSS model.

Descriptors: Obesity; Overweight; Social Determinants of Health; Women.

Whats is already known on this?
The social determinants of health have been recognized as fundamental causes of illness in a population, but the relationships between social and environmental factors that contribute to obesity are underestimated.

What this study adds?
Health professionals should consider using evidence linking obesity to social determinants to carry out more specific interventions to prevent and control excess weight.

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Resumo

Objetivo: *Analisar os determinantes sociais de saúde associados ao excesso de peso e à obesidade em mulheres.* ***Métodos:*** *Estudo transversal realizado com mulheres com índice de massa corporal (IMC) ≥25 kg/m2, acompanhadas em um centro de referência em obesidade em Salvador-Ba. Utilizaram-se dados secundários de 161 prontuários que foram organizados em camadas segundo o modelo dos Determinantes Sociais de Saúde e analisados pela estatística descritiva e Teste Exato de Fisher.* ***Resultados:*** *Na camada 1 dos DSS verificou-se o predomínio da faixa etária 40-59 anos (84;52,2%) e raça/cor parda (93;57,8%). Encontrou-se associação entre IMC e faixa etária (p=0,015). Na camada 2, observou-se que não faziam dieta (102; 63,4%), não realizavam atividade física (112; 69,6%) e eram etilistas (63;39,1%), havendo associação significativa entre o IMC e etilismo (p=0,045). Na camada 3, coabitavam no domicílio com menos de 3 pessoas (63; 39,1%). Quanto à camada 4, houve predomínio das mulheres com 2º grau (89; 55,3%), renda menor de um salário mínimo (79;49,1%) com emprego remunerado formal (69; 42,9%), sendo que a escolaridade mostrou associação com IMC (p=0,016).* ***Conclusão:*** *Houve associação significativa entre IMC e faixa etária na camada 1, com etilismo na camada 2 e com escolaridade na camada 4 do modelo dos DSS.*

Descritores: *Obesidade; Sobrepeso; Determinantes Sociais da Saúde; Mulheres.*

Resumén

Objetivo: *Analizar los determinantes sociales de la salud asociados al sobrepeso y la obesidad en mujeres.* ***Métodos:*** *Estudio transversal realizado con mujeres con índice de masa corporal (IMC) ≥25 kg/m2, seguidas en un centro de referencia en obesidad de Salvador-Ba. Se utilizaron datos secundarios de 161 historias clínicas, organizadas en estratos según el modelo de los Determinantes Sociales de la Salud y analizadas mediante estadística descriptiva y Prueba Exacta de Fisher.* ***Resultados:*** *En el estrato 1 de los DSS predominó el grupo de edad 40-59 años (84;52,2%) y raza/color pardo (93;57,8%). Se encontró asociación entre el IMC y el grupo de edad (p=0,015). En el estrato 2 se observó que no hacían dieta (102; 63,4%), no realizaban actividad física (112; 69,6%) y tomaban alcohol (63; 39,1%), con asociación significativa entre el IMC y el alcoholismo (p=0,045). En el estrato 3, vivían en el hogar con menos de 3 personas (63; 39,1%). En cuanto al estrato 4, hubo predominio de mujeres con educación secundaria (89; 55,3%), ingresos inferiores a un salario mínimo (79; 49,1%) con empleo formal remunerado (69; 42,9%), advirtiéndose que la educación mostró asociación con el IMC (p=0,016).* ***Conclusión:*** *Hubo asociación significativa entre el IMC y el grupo de edad en el estrato 1, con el consumo de alcohol en el estrato 2 y con la educación en estrato 4 del modelo de DSS.*

Descriptores*: Obesidad; Sobrepeso; Determinantes Sociales de la Salud; Mujeres.*

INTRODUCTION

Obesity, defined as excess body fat that is harmful to health, is considered to be a worldwide epidemic due to its increasing prevalence in recent times.[1] According to the Atlas of Obesity, by 2022 it has been estimated that there will be 1 billion overweight people in the world.[2] When it comes to the national scenario, in 2021, the overweight prevalence was 61.42%, with 24.35% already obese.[3]

Excess weight causes economic and public health damage, due to its relationship with predisposition to other pathological conditions (cardiovascular diseases, musculoskeletal disorders, diabetes and mortality in general) and its clinical costs. It's worth noting that because these diseases require prolonged treatment and monitoring in basic health units and specialized monitoring centers, there is an overload of these services and an increase in the cost of treating them for the population and society in general.[4]

The increase in the prevalence of excess body fat is associated with the modernization of society and changes in lifestyle.[5] In recent years, more and more favorable environments have been built for the increase in obesity.[6] The standard of living has been affected by inadequate stimuli, rapid access to high-sodium and high-calorie foods, as well as a growing sedentary lifestyle. The latter is generally due to various factors, such as neighborhoods with no structure or security to encourage the community's interest and participation in physical exercise and complex daily routines, which make time for self-care unavailable or detrimental.[7]

Still on the subject of the etiology of excess weight, it should be noted that it is a multifactorial disease caused by a combination of biological, genetic, social, environmental and behavioral determinants.[6,8] For some time, obesity was attributed to individual causes within the person's control, such as food choices, amount of exercise or willpower, underestimating the social and environmental factors that contribute to obesity. Nowadays, social vulnerability to the disease has been recognized.[9] For these authors, the prevalence of obesity is significantly associated with gender, racial-ethnic identity, socioeconomic status and the complex relationships between each of these characteristics.

Although the treatment of excess weight essentially consists of changing habits of a healthy eating pattern and regular physical activity,[4] it is known that access to healthy food and the availability of time and places to practice physical activity differ between geographical areas and the population's socio-economic level. Therefore, it can be said that therapeutic resources also extend to the person's living

conditions and interpersonal relationships, as well as their participation in the etiology of excess weight.[9-10]

These factors that participate in the etiology of the health-disease process are constituted by the social context in which the individual is inserted and are called Social Determinants of Health (SDH). These are defined as a complex network of economic, social, cultural, ethnic/racial, psychological and behavioral conditions, such as education, income, occupation, housing, neighborhoods, individual socioeconomic status, etc.[11]

The SDH have been increasingly recognized as fundamental causes of a population's health conditions, and their effects extend to chronic diseases such as obesity. A study points to the presence of inequalities in the prevalence of overweight and obesity, with a higher frequency in the population of low socioeconomic status.[12]

Within this scenario, when it comes to overweight and its intervention measures, it is necessary to analyze which social determinants of health are most frequent in the reality of the study population, in order to provide the health professional team with subsidies for reflection on their role and, consequently, the search for a care plan geared towards the reality described, enabling effective access for the population to tackle overweight.

In view of these considerations, the aim of this study was to analyze the social determinants of health associated with overweight and obesity in women.

METHODS

This is a descriptive cross-sectional study carried out in an obesity referral center. This outpatient center belongs to a Private Higher Education Institution, located in Salvador - BA and established in 2009. It currently has 480 registered patients, who are monitored by a multidisciplinary team including a nurse, nutritionist, endocrinologist and psychologist.

The study population was made up of women with a body mass index (BMI) equal to or greater than 25 kg/m2 and over 18 years of age who are followed up as outpatients at the center. Women with incomplete data in their medical records and with physical difficulties that prevented them from measuring their weight and height were excluded. Men were not included in the study because they represented only 9% of the patients being monitored, which could interfere with the analysis.

Secondary data from the Matrix project database "Effect of multiprofessional follow-up on the control of overweight and comorbidities in obese women: a retrospective cohort" was used, based on the information available from initial consultations in the Obesity Outpatient Clinic databases. The sample was selected on the convenience basis, as it only used data from a portion of the population enrolled in the project, due to the limited period for data collection and the absence of information considered important for this study.

The variables considered for analysis in this study were: sociodemographic data (age, education, income, race/color, occupation and cohabitation); lifestyle data (diet, alcohol consumption, smoking); clinical and treatment data (comorbidities, weight in kg and height in cm for calculating body mass index (BMI), onset of excess weight, treatments and follow-up time for weight loss). The comorbidities arterial hypertension (AH), diabetes mellitus (DM) and dyslipidemia were collected from the patients' medical records directly from their answers to the question as to whether they had already been diagnosed with the aforementioned diseases.

This data was then allocated for organization, analysis and presentation in the different layers of the SDH Dahlgren and Whitehead Model created in 1991[11]: Layer 1 (age, race/color, AH, blood pressure classification, DM, dyslipidemia, BMI). BMI was categorized as overweight (25≥29 kg/m2), grade I obesity (30≥34.9 kg/m2), grade II obesity (35≥39.9 kg/m2) and grade III obesity (≥40 kg/m2); Layer 2 lifestyle and behaviors in relation to treatment follow-up (diet, physical activity, smoking, drinking, previous treatments); Layer 3 (cohabitation with family members); and Layer 4 (education, income and occupation). Income was collected in R$ and categorized based on the minimum wage before the 2023 readjustment (R$1212.00). Occupation was categorized as: unpaid (housewife, unemployed and student), formal paid employment (formal employment) and informal paid employment (self-employed, salespeople and service providers). Layer 5, which refers to distal determinants, was not considered for the study, as it refers to macro social determinants, such as political and environmental issues, which were not included in the medical records analyzed.

Initially, descriptive and exploratory statistical analysis was carried out on the variables selected by the DSS model (absolute and relative frequency). For bi-variate analysis, Fisher's exact test was used, considering statistical significance when p<0.05. The data was analyzed using IBM SPSS Statistics 27.

In relation to ethical aspects, the matrix project was approved by the Research Ethics Committee of the Bahiana School of Medicine and Public Health under opinion number 4.430.105. CAAE 3974220.0.0000.5544. It should be emphasized that data collection for the matrix project respected ethical principles in accordance with Resolution 466/2012 and was only carried out after explaining the objectives of the research to the participants and signing the Informed Consent Form (ICF).

RESULTS

The study sample consisted of 161 overweight women with a mean age of 51.6 (SD ± 11.9) years and a BMI of 38.6 kg/m2 (SD ± 7.5), with a minimum of 25.4 kg/m2 and a maximum of 68.6 kg/m2.

Table 1 describes the characteristics of overweight women according to layer 1 (individual determinants) and layer 2 (proximal determinants) of the DSS model, and the association of these determinants with BMI. There was a predominance of the 40-59 age group (84; 52.2%) and brown race/color (93; 57.8%). In relation to lifestyle, most of the women didn't follow a diet (102; 63.4%), didn't practice physical activity (112; 69.6%), were drinkers (63; 39.1%) and didn't smoke (154; 95.7%). As for comorbidities, most of the participants had already been diagnosed with AH (82; 50.9%), DM (31; 19.3%) and dyslipidemia (54; 33.5%). At the time of admission to the program, their blood pressure was altered (76; 46%).

There was a significant association between BMI and age group in layer 1 (p=0.015) and BMI with alcohol consumption in layer 2 (p=0.045). No statistical significance was found between BMI and the other variables in layers one and two of the DSS model (Table 1).

Table 1 - Association between layers 1 and 2 of the Social Determinants of Health Model (SDH) and body mass index (BMI) in overweight women. Salvador, BA, Brazil, 2023. (N=161)

Variables	Total N (%)	Overweight N (%)	Grade I obesity N (%)	Grade II obesity N (%)	Grade III obesity N (%)	P-value*
Layer 1 - Individual determinants						
Age group						0.015
<40 years old	29 (18.0)	3 (21.4)	4 (8.9)	8 (19.5)	14 (23.0)	
40 – 59 years	84 (52.2)	3 (21.4)	24 (53.3)	27 (65.9%)	30 (49.2)	
≥60	48 (29.8)	8 (57.1)	17 (37.8)	6 (14.6%)	17 (27.9)	
Race/Skin color						0.733
Brown	93 (57.8)	8 (57.1)	23 (51.1)	24 (58.5)	38 (62.3)	
Black	56 (34.8)	5 (35.7)	19 (42.2)	12 (29.3)	20 (32.8)	
White	12 (7.5)	1 (7.1)	3 (6.7)	5 (12.2)	3 (4.9)	
Arterial hypertension						0.050
No	79 (49.1)	9 (64.3)	23 (51.1)	25 (61.0)	39 (63.9)	
Yes	82 (50.9)	5 (35.7)	22 (48.9)	16 (39.0)	82 (50.1)	
Blood pressure (BP) classification						0.133
Normal BP	86 (53.4)	10 (71.4)	23 (51.1)	26 (63.4)	27(44.3)	
Altered BP	75 (46.6)	4(28.6)	22 (48.9)	15 (36.6)	34 (55.7)	
Diabetes mellitus						0.315
No	130 (80.7)	10 (71.4)	39 (86.7)	35 (85.4)	46 (75.4)	
Yes	31 (19.3)	4 (28.6)	6 (13.3)	6 (14.6)	15 (24.6)	
Dyslipidemia						0.466
No	107 (66.5)	9 (64.3)	27 (60.0)	26 (63.4)	45 (73.8)	
Yes	54 (33.5)	5 (35.7)	18 (40.0)	15 (36.6)	16 (26.2)	
Onset of obesity						0.511
Childhood	33 (20.5)	3 (21.4)	8 (17.8)	7 (17.1)	15 (24.6)	
Adolescence	19 (11.8)	1 (7.1)	4 (8.9)	3 (7.3)	11 (18.0)	
Adult	109 (67.7)	10 (71.4)	33 (73.3)	31 (75.6)	35 (57.4)	

Layer 2 - Proximal determinants						
Variables	**Total N (%)**	**Overweight N (%)**	**Grade I obesity N (%)**	**Grade II obesity N (%)**	**Grade III obesity N (%)**	**P-value***
Diet						0.461
No	102 (63.4)	11 (78.6)	25 (55.6)	27 (65.9)	39 (63.4)	
Yes	59 (36.6)	3 (21.4)	20 (44.4)	14 (34.1)	22 (36.6)	
Physical activity						0.257
No	112 (69.6)	11 (78.6)	29 (64.4)	25 (61.0)	47 (77.0)	
Yes	49 (30.4)	3 (21.4)	16 (35.6)	16 (39.0)	14 (23.0)	
Smoking						0.404
No	154 (95.7)	13 (92.9)	43 (95.6)	38 (92.7)	60 (98.4)	
Yes	7 (4.3)	1 (7.1)	2 (4.4)	3 (7.3)	1 (1.6)	
Alcoholism						0.044
No	98 (60.9)	10 (71.4)	25 (55.6)	19 (46.3)	44(72.1)	
Yes	63 (39.1)	4 (28.6)	20 (44.4)	22 (53.7)	17(27.9)	
Previous diet-based treatment						0.265
No	102 (63.4)	10(71,4%)	23 (51.1)	28 (68.3)	41(67.2)	
Yes	59 (36.6)	4(28,6%)	22 (48.9%)	13 (31.7%)	20 (32.8)	
Previous treatment based on physical activity						0.556
No	156 (96.9)	13 (92.9)	43 (95.6)	40 (97.6)	60 (98.4)	
Yes	75 (3.1)	1 (7.1)	2 (4.4)	1 (2.4)	1 (1.6)	
Previous treatment with medication						0.096
No	119 (73.9)	13 (92.9)	37 (82.2%)	27 (65.9)	42 (68.9)	
Yes	42 (26.1)	1 (7.1)	8 (17.8%)	14 (34.1%)	19 (31.1)	
Previous treatment with follow-up						0.783
No	120 (74.5)	11 (78.65)	34 (75.6)	28(68.3)	47 (77.0)	
Yes	41 (25.5)	3 (21.4)	11 (24.4)	13(31.7)	14 (23.0)	

*Fisher's exact test
Source: the authors.

Table 2. Association between layers 3 and 4 of the Social Determinants of Health Model (SDH) and body mass index (BMI) in overweight women. Salvador, BA, Brazil, 2023 (N=161)

Variables	Total N (%)	Overweight N (%)	**Grade I obesity N (%)**	**Grade II obesity N (%)**	**Grade III obesity N (%)**	**P-value***
Layer 3 - Influence of social and community networks						
Cohabitation with relatives						
<3 people	63 (39.1)	5 (35.7)	17(37.8)	14 (34.1)	27 (44.3)	0.667
= 3 people	44 (27.3)	2 (14.3)	15 (33.3)	11 (26.8)	16 (26.2)	
> 3 people	54 (33.5)	7 (50.0)	13 (28.9)	16 (39.0)	18 (29.5)	
Layer 4 - Intermediate Determinants						
Education						**0.016**
Up to Elementary School	46 (28.6)	4 (28.6)	12(26,7%)	9(22.0)	21(34.4)	
Up to High School	89(55.3)	7(50.0)	21(46.7)	23(56.1)	38(62.3)	
Up to Higher Education	26(16.1)	3(21.4)	12(26,7%)	9(22.0)	2(3.3)	
Income (minimum wage)						0.084
< 1	79 (49.1)	7 (50.0)	22(48.9)	24 (58.5)	40 (65.6)	
1 to < 2	64 (39.8)	6 (42.9)	16(35.6)	9 (22.0)	19 (31.1)	
> 2	18 (11.2)	1 (7.1)	7(15.6)	8 (19.5)	2 (3.3)	
Occupation						0.303
No remuneration	42 (26.1)	2 (14.3)	9 (20.0)	12 (29.3)	19 (31.1)	
Formal remuneration	69 (42.9)	7 (50.0)	21 (46.7)	21 (51.2)	20 (32.8)	
Informal remuneration	50 (31.1)	5(35.7)	15 (33.3)	8 (19.5)	22 (36.1)	

*Fisher's exact test
Source: the authors.

DISCUSSION

The literature already mentions that many predisposing factors to excess weight vary depending on geography, social conditions, political and economic factors and human genetics, and that in aggregate, the most common factors are sociodemographic, behavioral, genetic and living in an obesogenic environment.[13]

This study showed that the women who are monitored at the referral center are concentrated in the 40-59 age group. This finding may be justified by the association of predisposing factors for excess weight, such as the climacteric and menopause at this age, which has already been shown in the literature.[14] Data from Vigitel 2023 showed that overweight in the Brazilian adult female population predominated in people aged 45 to 64 (66.7%).[3]

The bivariate analysis showed a significant association between age group and BMI. A study shows that overweight and obesity become more prevalent with increasing age in both genders, but in general tends to decrease after the age of 60.[4]

Although the physiological process of human development is individual, it is a condition that is inseparable from the way we live and is closely linked to socio-economic, cultural and environmental factors. These factors lead individuals to lead a lifestyle that makes them vulnerable to weight gain over the years.[15]

Although the race/color variable was not significantly associated with BMI, there was a higher proportion of women of black race/color (black + brown), which accounted for 92.6% of the participants. This figure is in line with IBGE statistics, which show that Salvador is the country's black capital, since in 2018, black people accounted for 82.1% of the country's 2.954 million people.[16]

It is worth noting that black and brown people in Brazil continue to have worse living conditions, with less access to employment, education, safety and sanitation, conditions that correlate with access to healthy food, adequate space and time for physical activity and access to health services and are therefore more susceptible to weight gain.[17] It is known that although individual factors refer to lifestyles and choices, these are influenced by social, political, economic and cultural macro-determinants, i.e. socially produced situations, denoting people's greater or lesser susceptibility.[9]

As for comorbidities, the high percentage of the population with a previous AH diagnosis is relevant considering that excess weight is one of the most important risk factors for the development of chronic non-communicable diseases.[18]

Although no association was found between AH and BMI in this study, research has shown that an increase in BMI is significantly associated with an increase in systolic and diastolic blood pressure.[4] According to the Brazilian Society of Cardiology, AH is the most prevalent chronic disease worldwide, and increased body weight, adiposity, BMI or abdominal circumference are strongly associated with higher blood pressure and AH development.[20]

Another aspect of no less importance is the fact that 46.6% of the women had a change in blood pressure when they entered the program, indicating a lack of control and that the approach of health professionals must go beyond weight control and focus on controlling blood pressure levels and the factors in each person's life that interfere with this process.

In addition, although only 19.3% of the overweight women in this study reported a DM diagnosis, this figure is noteworthy considering that these two health conditions share common pathophysiological mechanisms, leading to a close relationship between them.[21] Obesity increases the pathogenesis of DM2 by stimulating insulin resistance,[22] which makes it essential to track and understand weight accumulation in order to draw up a therapeutic plan for outpatients for better control of diabetes and its complications.

Considering that around 30% of the women had a history of dyslipidemia, this finding is important, as obesity is also closely linked to lipid disorders.[23] The aforementioned authors mention that the atherogenic dyslipidemia commonly found in people with obesity is strongly associated with cardiovascular disease and that its treatment is fundamental to reducing DM risks, cardiovascular atherosclerotic disease and all-cause mortality.

In relation to lifestyle, which belongs to DSS layer 2, a significant association was only found with alcohol consumption. Findings in the literature mention alcohol consumption as a significant variable in relation to weight gain in their results.[24] It is also known that excessive alcohol consumption can be a source of calorie intake, leading to various health problems, such as obesity and cardiovascular disease.[25]

However, one point that should be highlighted is the high percentage of women who were not on a diet and who were physically active, considering that these practices are the pillars of treatment for

weight control. The evidence on the inverse association between physical activity and long-term weight gain is already well established in the literature.[26] Thus, health professionals should be aware of the barriers that prevent people from practicing leisure-time physical activity, and together find ways around this problem.

Continued physical activity has many health benefits, especially for the cardiovascular/metabolic and immune systems. However, during the Covid-19 pandemic, with social isolation and the closure of places to practice physical activities, recommended to prevent the spread of the disease, many people stayed at home. The restrictions of the pandemic have affected the population's physical activity routine and contributed to an increase in physical inactivity among Brazilians in different age groups.[27] At the same time, research claims that these situations experienced during the pandemic have changed the population's lifestyle and favored the growth in the number of overweight and obese individuals.[28-29]

In relation to treatments carried out prior to joining the program, there was a low level of demand from participants for preventive or therapeutic measures to control excess weight, based on changing lifestyle habits. Because of this reality, it is worth mentioning that the dropout rates for non-pharmacological treatment are high and can be explained by factors both intrinsic and extrinsic to the individual.[30] It is therefore essential to be aware of the difficulties people have in following the guidelines that would lead them to control their weight. Attitudes of blaming the individual should be avoided and the focus should be on a process of standardization, since changes to the standard also involve meanings linked to the act of eating, the body and living.

The higher overweight prevalence, especially among the lower-income population, may be related to their food consumption. According to the Brazilian Obesity Guidelines (2016), the Brazilian population has shown changes in dietary patterns in recent decades that have contributed to excess weight. These changes mainly refer to increased food intake, increased consumption of foods with high caloric density, low satiating power and easy absorption and digestion, a decrease in the number of meals eaten at home and an increase in fast food consumption.[25]

Another problem related to Brazilians' eating habits has been the reduced consumption of fruit and vegetables which, according to Vigitel (2020), has been below the recommended levels needed to prevent CNCDs, as only 21.4% have been consuming fruit and vegetables raw (in the form of salads) or cooked at lunch and/or dinner every day. In terms of eating habits, only 30.1% consume non- or minimally-processed foods that are only protective against chronic diseases.[3]

Also, in relation to lifestyle habits, low physical activity levels are linked to the accumulation of body fat. The population's current lifestyle is a contributing factor to reduced calorie expenditure. A qualitative study points out that the older population justifies physical inactivity by the lack of accessibility, climate, comfort of the home/bedroom with television, pain problems and loneliness.[31] All these factors must be identified during care activities so that the health professional's guidance is individualized and more likely to be successful.

In relation to layer 3, which refers to factors of social and community influence, most of the participants reported a smaller number of inhabitants in their home and, consequently, less influence on aspects of daily life. Generally speaking, homes with many residents present problems related not only to higher food costs and, therefore, less access to healthier foods, but also to the difficulty of making separate, individualized meals. Still on the subject of living with family members, we must also consider that family habits influence food choices.[32]

Food choices are essential for maintaining good health and promoting quality of life. Some studies have shown that various factors influence food choice, such as lack of time, the influence of advertising, sensory appeal, price, health concerns and/or demographic and social changes.[19-33] This has led to a change in eating patterns, with an increase in the consumption of ultra-processed foods to the detriment of healthy foods. As a result, it is worth emphasizing that food choices have a significant influence on health and that inadequate food choices contribute to the development of overweight and obesity.

In the DSS model's layer 4, there was a significant association between BMI and education level. A study on the prevalence and associated factors of obesity in the Brazilian population identified, in bivariate and multivariate analyses, that the lower the women's education level, the greater the chance of obesity.[4] In the literature, a higher education level is seen as a protective factor, reducing the likelihood of being overweight by 35% among women with 12 or more years of education. One of the aspects that may lead women with more education to control their weight is the high aesthetic standards of their gender, as well as greater accessibility to therapeutic approaches.[34]

Although no statistical significance was found in the association between income and BMI, it is known that income is an important indicator of access to healthier foods, physical activity and health care.

Aware of the complexity involved in controlling excess weight, a fundamental aspect is that the approach to people with this problem should preferably be multi-professional and individualized. Therefore, it should not only include weight reduction in isolation, but should also consider metabolic improvement, improved adherence to therapy, improvement in the psychological suffering involved, considering the whole individual, family and socio-economic context of the individual. These considerations reinforce the significance that SDH have in the population's health-disease process and that they should always be taken into account in the care process.

The study was limited, a priori, by the fact that secondary data was obtained from medical records with records of initial consultations, which did not provide complete information for evaluating some of the SDH variables. Another limitation was the small sample size due to the fact that some medical records had incomplete data and were excluded from analysis. As this is a cross-sectional study, it is not possible to infer causality. Therefore, the results should only be considered in relation to the associations between the variables related to the determining factors and BMI. It should be emphasized that this study's results broaden and strengthen knowledge about the involvement of SDH in overweight, which can contribute to reflection and the implementation of new forms of health care for this specific population.

CONCLUSION

It is concluded that there was a statistically significant association between excess weight (BMI) and age group in layer 1, with alcohol consumption in layer 2 and with education level in layer 3 of the SDH Dahlgren and Whitehead model. There was a significant frequency of older women who were not being treated with diet and physical activity to control their weight, and who were also diagnosed with other comorbidities such as AH, DM and dyslipidemia.

The data found point to the need to review outpatient care strategies in order to improve adherence and effectiveness of the therapeutic plan, and care should be reinforced, especially considering the participants' profile, which was mostly marked by conditions of greater social vulnerability due to low education and income, and difficulty in controlling weight, especially in relation to the layer 2 (lifestyle) determinants.

The results of this study cannot be generalized to all overweight women and further studies need to be carried out involving a larger number of participants and different scenarios.

CONTRIBUITIONS

Contributed to the conception or design of the study/research: Freitas MJS, Palmeira CS. Contributed to data collection: Freitas MJS, Palmeira CS. Contributed to the analysis and/or interpretation of data: Freitas MJS, Palmeira CS. Contributed to article writing or critical review: Freitas MJS, Palmeira CS, Lima ML, Macedo TTS. Final approval of the version to be published: Freitas MJS, Palmeira CS, Lima ML, Macedo TTS.

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