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Nutritional Profile of Clients with Obesity Treated at the School Clinic

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Abstract

Introduction: Obesity can be conceptualized in a simplified way, as a condition of abnormal or excessive accumulation of fat in the body. Objective: To characterize the nutritional profile of the clients with obesity treated at the Integrated Clinic of Health Care at UNA University Center, Belo Horizonte, Brazil.

Methods: This is a longitudinal observational study performed with men and women with obesity in the second half of 2017. Sociodemographic, clinical, anthropometric and nutritional data were collected from 216 clients. The greatest demand for the service was of women, in the age group of 20 to 59 years, in the masculine sex there was the greater amount of stylist. Regarding the level of schooling and physical activity the predominance was female, but the number of smokers was equal in both sexes.

Results and Discussion: The reported diseases were 16.47% with arterial hypertension in the female sex. However, a 24.07% share of total treatment withdrawal occurred. The female sex obtained the highest number of consultations performed on average (2.62), but there was a satisfactory weight loss, established according to the number of consultations performed. The greatest weight loss was in the male sex, equivalent to (12kg).

Conclusion: The prescribed diet needs to be well planned according to the individuality of each patient, performed and evaluated throughout the process; it requires continuity, effort and permanence in the treatment.

Keywords: Obesity, Eating habits, Nutritional assessment.

Abbreviations: WC-Waist Circumference, BF-Bicipital Fold, TF-Tricipital Fold, SCEF-Subscapular Fold, SIF-Suprailiac Fold, BMI-Body Mass Index.

Introduction

Obesity can be conceptualized in a simplified way, as a condition of abnormal or excessive accumulation of fat in the body, leading to a compromised health. The degree of excess fat, its distribution and its association with health consequences vary considerably among obese individuals. Obesity has emerged as an epidemic in developed countries during the last decades of the twentieth century. However, it currently reaches all socioeconomic levels and has increased its incidence, also in developing countries. The prevalence of obesity in the world and Brazilian population has become a major public health problem and may promote diseases associated with overweight and the with consequences of diabetes mellitus type2, hypercholesterolemia, breathing difficulties, dyslipidemia, cardiovascular disease and certain types of cancer, sleep apnea, psychosocial disorders and osteoarthritis [1-3].

According to the Survey on Risk Factors and Protection for Chronic Diseases by Telephone Survey, one in five people in the country are overweight. The prevalence of the disease went from 11.8% in 2006 to 18.9% in 2016. According to the World Health Organization, it is projected that by 2025 about 700 million adults are obese and the number of overweight and obesity in the world can reach 75 million if there is no intervention. The etiology of obesity is not easily identified and can be classified into two contexts: the first by genetic determination or endocrine and metabolic factors. The second refers to external factors, whether of dietary, behavioral or environmental origin. External factors are believed to be more relevant in the incidence of obesity than genetic factors. Clinical treatment of obesity can be both drug and non-drug. The patient should understand that weight loss is much more than a cosmetic measure and aims at reducing morbidity and mortality associated with obesity.

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45

Losses of 5 to 10% of initial body weight are associated with significant reductions in blood pressure, blood glucose and serum lipid values [4-7]. Drug treatment serves as auxiliary treatment and, in conjunction with changing habits, may decrease weight gain [1]. With all the advances, a drug that could fight obesity has not yet been developed, so changing eating habits and physical activity, non-drug treatment is the most efficient ways to reverse and prevent this condition. In the context of non-drug treatment, the Integrated Health Care Clinic of the UNA University Center, in Brazil empowers nutrition course teachers to provide nutritional care to the external public with difficulties in accessing primary care in different pathologies, such as obesity. Thus, the objective of this study is to characterize the nutritional profile of obese clients treated at the Integrated Health Care Clinic of the UNA University Center, Belo Horizonte, Minas Gerais [8,9].

Materials and Methods

This is an observational, longitudinal study conducted with obese clients seen at the Integrated Health Care Clinic, located at the UNA University Center, Belo Horizonte, Brazil. The study was approved by the Ethics Committee of the UNA University Center under opinion number CAAE 67531517.2.0000.5098. Sociodemographic, clinical, anthropometric and nutritional data of obese clients, attended in the second half of 2017, were collected from medical records.

The sociodemographic data collected were: gender, schooling age, clinical: reason for consultation, diseases, smoking, alcoholism, physical activity practice and anthropometric: current weight, height, Waist Circumference (WC), Bicipital Fold (BF), Tricipital Fold (TF), Subscapular Fold (SCEF) and Suprailiac Fold (SIF).

To measure body weight, a Welmy® digital scale was used with a stadiometer coupled with a maximum capacity of 150 kg, with individuals standing barefoot with their backs to the scales. The height of the clients was also measured, with the arms extended close to the body, head elevated. Using weight and height, the Body Mass Index (BMI) was calculated by the formula weight/height² (kg/m²).

They used the cutoff points to classify the BMI of adolescents, adult and elderly. Waist circumference was measured with an inextensible tape measure, with the abdomen relaxed, arms relaxed at the side of the body, and the tape placed horizontally at the midpoint between the bottom edge of the last rib and the iliac crest, according to the reference manual anthropometric analysis. To classify WC, the stipulated value of ≥ 102 cm for men and ≥ 88 cm for women was used as the American best indicator of obesity and cardiovascular diseases [10-16].

The technique for making all adipose folds should be on the right side of the body, carefully identifying, measuring and marking the location of the adipose folds. It is necessary to define the major axis of the fold and it should be held firmly between the thumb and forefinger, left hand. The body fat percentage was calculated by summing the values in mm of the BF, TF, SCEF and SIF folds, and then finding the corresponding value, according to age and gender.

Nutritional data of energy values were collected from the 24-hour dietary recall method (R24h), which quantifies the foods and drinks consumed on the previous day. Like the R24h the prescribed diet was calculated by the Diet box Professional version 2017 software. Weight loss and number of consultations was collected from the client's first return to the clinic to seek diet and so on. All data were distributed by sex and age group: adolescents from 13 to 19 years old, adults from 20 to 59 years old and elderly from 60 to 86 years old [17-20].

Results

In the second semester of 2017, 922 clients were assisted, of which 216 met the inclusion criteria of the survey, where they were classified based on the degree of obesity (BMI ≥ 30 kg/m²). As observed in **Table 1**, among the 216 clients who were evaluated, females prevail over males, with age ranging from 20 to 59 years.

Age range	Males		Females	
Years	n	%	n	%
19-Oct	2	5,00	10	5,68
20-59	35	87,50	142	80,68
≥ 60	3	7,50	24	13,64
Total	40	100	176	100

Table 1: Gender and age range of clients seen at the UNA Integrated Health Care Clinic, period 2/2017.

Table 2 and **Table 3** show the educational level of the patients, ranging from illiterate to graduates with complete higher education and the use of tobacco, alcohol and physical activity.

Age range	Males				Females			
Years	Illiterate	Elementary	High School	Graduated	Illiterate	Elementary	High School	Graduated
19-Oct	0	0	1	1	0	4	9	3
20-59	2	6	13	13	5	11	70	49
≥ 60	0	2	2	0	4	7	13	1

Table 2: Degree of education, distributed by sex and age group, of the clients attended at the UNA Integrated Health Care Clinic, period 2/2017.

Age range	Males			Females		
Years	SMO	ALC	PA	SMO	ALC	PA
19-Oct	0	1	1	0	2	2
20-59	1	20	15	1	38	67
≥ 60	0	1	0	0	7	10

*Note: SMO=Smoker, ALC=Alcoholic, PA=Physical Activity.

Table 3: Tobacco, alcohol and physical activity use, distributed by sex and age group, of the clients attended at the UNA Integrated Health Care Clinic, period 2/2017.

Regarding the clinical data collected, the reasons for seeking care in the clinic reported by the patients were: dietary reeducation, weight loss, obesity, medical indication and diseases in which they intended to control or even suppress them. The most informed diseases were hypertension, type 1 and ll diabetes, obesity, and hyperthyroidism. **Table 4** and **Table 5** show the average data related to anthropometric assessment and dietary intake of clients evaluated at the Clinic. **Table 6** shows the average number of consultations and weight loss.

Age range	Males			Females		
Years	BMI	WC	%F	BMI	WC	%F
19-Oct	32.25	102	33.05	33.9	89.5	33.18
20-59	40	126.5	32.45	37.75	104	38.45
≥ 60	36.6	114	41.85	38.85	101.5	40.6

*Note: BMI=Body Mass Index, WC=Waist Circumference, (cm) %F=Fat Percentage.

Table 4: Average data-body mass index, waist circumference, fat percentage, distributed by sex and age group, of the clients attended at the UNA Integrated Health Care Clinic, period 2/2017.

Age range	Males		Females	
Years	Recall Kcal	Diet Kcal	Recall Kcal	Diet Kcal
19-Oct	3.482	2.011	1.401	2.018
20-59	1.811	2.064	1.535	1.874
≥ 60	1.351	1.402	1.513	1.727

Table 5: Food recall and prescribed diet, distributed by sex and age group, of clients treated at the UNA Integrated Health Care Clinic, period 2/2017.

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46

Age range	Males		Females	
Years	Number of consultations	Weight loss (kg)	Number of consultations	Weight loss (kg)
19-Oct	1.5	1.5	2	0.76
20-59	1.82	1.28	2.14	1.18
≥ 60	4	1.66	2.62	0.97

Table 6: Number of consultations and weight loss, distributed by sex and age group, of the clients attended at the UNA Integrated Health Care Clinic, period 2/2017.

Discussion

Regardless of age group, it was found that females had more demand for clinical nutritional care, highlighting the age group of 20 to 59 years (Table 1). According to Oliveira, in Brazil, women are characterized by greater demand for nutritional care, seeking control and treatment of possible diseases. Usually men have a reluctance to seek care. Regarding the level of education (Table 2) the age group of 20 to 59 years, in both sexes, high school had the highest demand for nutritional care.

According to the Brazilians Oliveira patients education is fundamental to the success of the nutritional education work, since the concepts of healthy eating and proper food substitutions are often complex. Thus, care must be taken with the technical terms and concepts of nutrition science when targeting patients of different educational levels [21]. Since basic education there is a need for a nutritional approach, so that the client can grasp the importance of a healthy life, which will extend for a lifetime. Nutrition knowledge can also influence eating habits, suggesting that nutrition education is incorporated into the Brazilian school curriculum, actively involving teachers, the school community and family, in order to provide nutrition information and aspects related to food.

Regarding smoking (Table 3), similar results were obtained for both sexes, aged between 20 and 59 years old. According to the Ministry of Health, the age group with the highest prevalence of smokers in Brazil is from 20 to 49 years old, with a higher proportion of men. However, in recent years, the percentage of women has increased, as in the present study, where cigarette consumption by men and women was equal. According to Klein, smoking cessation can lead to a 75% increase in body weight in both sexes. Most studies related to smoking cessation and weight gain indicate that there is an increase in sweet food intake after cessation as a compensatory mechanism [22-25].

Regarding the consumption of alcoholic beverages, a greater number of alcoholics in the age group of 20 to 59 years old were identified in both sexes, from occasional consumption once a month to consumption 1 to 3 times a week. However, males stood out when compared to females. Considering that alcohol has energy value, it has the ability to suppress an individual's daily energy needs or overweight, depending on the amount, frequency and mode of consumption. Even with increased basal energy expenditure in alcoholics, this is often not enough to compensate for the large amount of energy intake. Thus, many alcohol-dependent individuals have overweight, obesity and even waist circumference above expected standards [26-29].

Among the practitioners of physical activity (Table 3), we highlight the age group of 20 to 59 years, in both sexes. Female clients practice a little more physical activity compared to male individuals. More than half of male clients do not practice any physical activity and the age group ≥ 60 years old have the worst result. In females, all age groups practice physical activity, but half of the clients did not practice any physical activity. The reported physical activities were characterized between walking, bodybuilding, Pilates, cross fit, volleyball, dance, running, aerobic among others. The World Health Organization recommends that adults perform physical activities in a variety of ways, such as through recreation, leisure, commuting, household chores, sports, or structured exercise.

Although these physical activities recommended for health, they should be designed in a special way for those who aim to reduce or control body weight. There is a consensus among researchers that physical activity is the best variable of energy balance components to predict success in maintaining body weight loss. People do not have enough time to perform constant physical activities, directly contributing to the concentration of excess body fat. Therefore, exercise should be recommended for obese individuals [30-33].

Regarding the reason for seeking nutritional care performed at the Clinic, it was found that dietary reeducation, obesity and weight loss were the main reasons for both sexes, in the age group of 20 to 59 years old. The largest demand among women occurred in all age groups. Overall, women use health services more than men, as women are more interested in their health, seeking more health services for routine screening and preventive care, while men are seeking more curative care [34,35]. Regarding illnesses, around half of male and female clients reported having no disease.

The age group of 20 to 59 years in females accounted for the highest percentage of reported diseases: 16.47% hypertension, 15.34% obesity, 2.11% with type 2 diabetes mellitus. The same age group also stood out in the male gender, identifying 25% with hypertension, 5% diabetes mellitus type 2 and 5% with obesity. The increased BMI, WC and %F values described in Table 4 demonstrate the importance of intensifying multi-professional follow-up. The highest BMI index was obtained in males (40 kg/m²), in the age group from 20 to 59 years old and in females (38.85 kg/m²) in those older than 60 years.

Lower values were found in another Brazilian study in a state bank: male group (36%) and women (17%) [36]. WC, the best indicator of obesity and cardiovascular disease, was above the standards indicated in both sexes, with a value of ≥ 102 cm for men and ≥ 88 cm for women, 19. The highest WC recorded was in the age group of 20 years. 59 year's old, male, with an average of 126.50 cm. The classification of fat percentage in women is estimated at <21% malnutrition, 21 to 32% eutrophic, 33 to 38.9% pre-obesity and >39% obesity. Males <8 malnutrition, 08 to 19.9% eutrophic, 20 to 24.9% pre-obesity, >25% obesity [37].

According to %F measured in the patients treated, there was a slight variation in relation to the data. Men and women, with the highest %F occurring in the age group of ≥ 60 years old in males with a mean of 41.85%. However, another study shows that the increase in body fat is higher in females, between 60 and 78 years old [38]. In studies by Matsudo, in Brazil, showed that over the years there is an increase in body fat and a reduction in lean mass in men and women. Data from the R24h reported by clients and the prescribed diet (Table 5) showed that the diet presented average energy consumption data higher than the dietary recall in the age group of 20 to 59 and ≥ 60 years old in both sexes, due to fact that customers have difficulty or are afraid to report their food intake [39].

The exception occurred only in the age group of 10 to 29 years in males, where the prescribed diet was lower than the 24-hour recall described by clients. In addition to the difficulty in correctly reporting the quantification of ingested foods, other factors are related to nutritional status and pathologies, in Brazilian study, people with low weight can stipulate the intake of food consumed, on the other hand, obese individuals tend to decrease this amount because the presence of diseases can lead to a memory bias report.

Recent studies show that the Brazilian diet has been increased with low nutrient and high calorie foods, called the risk diet. A high carbohydrate and lipid diet will certainly lead to obesity, as will a lack of physical activity to expend the excess energy accumulated. But

unlike the genetic factor, the environmental factor can be reversed [40-42].

The prescribed diet is designed according to the specificity of each patient, and should respect the possibility of each one to follow the suggested diet plan for weight loss. Dietary planning is based on the establishment of habits and practices related to food choice, eating behaviors, adequacy of energy expenditure and reduction of energy intake that will have to be incorporated in the long term, according the study conducted in Brazil [43]. Table 6 presents the average number of consultations and weight loss. The average number of consultations ranged from 1.5 to 04, where men stood out with a higher average of consultations, in the age group above 60 years, followed by the female group of the same age group.

Weight loss ranged from 1 to 12 kg among males, and the highest average was found in the age group $\geq$ 60 years old. The female group had a higher average weight loss, aged 20 to 59 years, followed by the group above 60 years. The World Health Organization recommends for moderately obese individuals (BMI<35.0 kg/m²) a weight reduction of 5% to 15%, which can be achieved through a nutritionally adequate diet that is easier to manage and maintain [44]. In addition, losses in these proportions are related to a significant reduction in associated comorbidities [43].

According to Willett the recommendation for dietary reeducation, conduct and the practice of eating healthy foods are stimulated aiming at progressive weight loss over time. Similarly, the percentage return of clients to the clinic shows a progress directly linked to weight loss, as seen in Table 6. The main limitation of this study is that the data collection was made from the Clinic Excel spreadsheet, which calculates the average customer data and has no median values and percentage distribution. It is known that the average values do not reflect the nutritional status of the clients. Like anthropometric data, the clinic's software has only average weight loss data [45].

Conclusion

According to the data presented, the greatest demand for nutritional care was for obese women aged 20 to 59 years old. However, the study showed that the male group stood out with a higher prevalence in BMI, WC and %F. The educational level was dominated by individuals with high school in the age group of 20 to 59 years old in both sexes. Smoking had the same number of clients for both male and female clients. As for alcohol, it identified the male customers with the highest consumption, aged between 20 and 59 years old.

However the practice of physical activity obtained the highest prevalence when compared with the opposite sex in the age group of 20 to 59 years old. In both sexes there was a proportion of treatment dropout. The largest number of appointments at the clinic was female, highlighting the age group from 20 to 59 years old. However, the greatest weight loss was recorded in males aged $\geq$ 60 years oldn, presenting a satisfactory weight loss among patients who remained assiduous at the appointments. Given this, it was emphasized the need for permanent and persevering nutritional care, evidencing weight loss.

The prescribed diet, therefore, must be well planned according to the individuality of each patient, executed and evaluated throughout the process, requires continuity, effort and permanence in the treatment. According to Amorim et al., 2018 the client's presence in the office proved to be fundamental for improving the anthropometric profile of people with obesity, however adherence to treatment is influenced by numerous factors that still need to be studied, as data are scarce in literature [46].

Acknowledgement

References

1. World Health Organization. Obesity: Preventing and managing the global epidemic. Geneva 1998.
2. Bernardi F, Cichelero C and Vitolo MR. Dietary restriction behavior and obesity (2005) Rev Nutr 18: 85-93. http://dx.doi.org/10.1590/S1415-52732005000100008
3. Monteiro CA and Conde WL. The secular tendency of obesity according to social strata: northeastern and southeastern Brazil 1975-1989-1997 (1999) Arq Bras Endocrinol Metabol 43: 186-94. http://dx.doi.org/10.1590/S0004-27301999000300004
4. Brazil. Brazilian Association for the Study of Obesity and Metabolic Syndrome (2016) Brazilian Obesity Directive, Sao Paulo 4: 16-20.
5. Aguiar SR and Manini R. The Physiology of Obesity: Genetic, Environmental Bases and Their Reaction to Diabetes (2013) With Science 145: 6-27.
6. Bouchard C. Physical activity and obesity. Sao Paulo: Manole; 2000.
7. Wadden TA and Foster GD. Behavior treatment of obesity (2000) Med Clin North Am 8: 441-461. http://10.1016/s0025-7125(05)70230-3
8. Bays He. Current and investigational antiobesity agents and obesity therapeutic treatment targets (2004) Obes Res 12: 197-211. https://doi.org/10.1038/oby.2004.151
9. Amorim MMA, Santiago MC and Azevedo DQ. Building Interdisciplinary Training at the Integrated Health Clinic at UNA University Center/Belo Horizonte/Brazil [Construction of Interdisciplinary Training at UNA Integrated Health Clinic/Belo Horizonte/Brazil] In: Rangel, MLS, Ramos, N) Communication and health: contemporary perspectives. Salvador 2017-2018.
10. Jelliffe DB. The assessment of the nutritional status of the community (1966) Monogr Ser World Health Organ 53: 3-271.
11. World Health Organization. Physical status: The use and interpretation of anthropometry. Geneva 1995
12. Cole TJ, Bellizzi MC, Flxegal KM and Dietz WH. Establishing a standard definition for child overweight and obesity worldwide (2000) international survey 320: 1240-1242. https://doi.org/10.1136/bmj.320.7244.1240
13. World Health Organization. The physical state: use and interpretation of anthropometry (1995) Genebra 452-854.
14. Lipschitz DA. Screening for nutritional status in the elderly (1994) Primary Care 21: 55-67.
15. Callaway CW, Chumlea WMC, Bouchard C, Himes JH, Lohman TG, et al. Circunferences in Anthropometric standardization reference manual (1998) 39-54.
16. Nhlbi. Obesity Education Initiative Expert Panel. Clinical Guidelines on Identification. Evaluation and Treatment of Overweight and Obesity in Adults. The Evidence Report; 1998. Available in: https://www.ncbi.nlm.nih.gov/books/NBK2003/. Acess in 2 Dec 2018
17. Moreira MH. Adipose Fold Evaluation. University of Trás-os-Montes and Alto Douro: Vila Real 1995.
18. Durnin JVA and Worsley J. Body fat assessed from total body density and its estimation from skinfold thickness (1974) British J Nutr 32: 77-97. https://doi.org/10.1079/bjn19740060
19. Gibson RS. Principles of nutritional assessment. Oxford: Oxford University Press (1990) Food consumption of individuals. 37-54
20. Buzzard M. 24-hours dietary recall and food record methods. In: Willett WC (1998) Nutr Epidemiology 50-73. https://doi.org/10.1093/acprof:oso/9780195122978.003.04
21. Oliveira AFL de S and Fatel EC de S. Profile of Patients Seeking Nutritional Care (2008) Guarapuava 2: 15-21.

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48

22. RM Triches and Giugliani ER. Obesity, eating practices and nutrition knowledge in schoolchildren (2005) Rev Saude Publica 39: 541-547. https://doi.org/10.1590/s0034-89102005000400004

23. Brazil. Ministry of Health. National Cancer Institute. Smoking in Brazil and worldwide.

24. Klein LC, Corwin EJ and Ceballos RM. Leptin, hunger, and body weight: Influence of gender, tobacco smoking, and smoking abstinence (2004) Addict Behav 29: 921-927. https://doi.org/10.1016/j.addbeh.2004.02.023

25. Rosemberg J, Rosemberg AMA and Moraes MA. Nicotine: universal drug [Nicotine: Universal Drug]. Sao Paulo

26. Gurr M. Alcohol, health issues related to alcohol consumption Bruxelas: International Life Sciences Institute (ILSE) 1996.

27. Suter PM. Is alcohol consumption a risk factor for weight gain and obesity? (2005) Crit Rev Clin Lab Sci 42: 197-227.

28. Vadstrup ES, Petersen L, Sorensen TIA, Grombaek M. Waist circumference in relation to history of amount and type of alcohol: results from the Copenhagen City Heart Study. Int J Obesity 2003; (27): 238-246. https://doi.org/10.1038/sj.ijo.802203

29. Kachani AT, Cardoso A, Furtado Y, Barbosa ALR, Brasiliano S, et al. Waist circumference measurement in alcohol and drug-dependent women. In: XXVIII Congress of the Society of Cardiology of the State of São Paulo (SOCESP) 2007.

30. https://apps.who.int/iris/bitstream/handle/10665/44399/9789241599979_eng

31. Dishman RK, Washburn RA and Heath GW. Physical activity and obesity. In: Physical activity epidemiology (2004) Champaign: Hum Kineti 165-188.

32. Keller S and Schulz PJ. Distorted food pyramid in kid's programmes: a content analysis of television advertising watched in Switzerland (2010) Europ J Pub Health 3: 300-305. https://doi.org/10.1093/eurpub/ckq065

33. Wallace JP, Ray S, Moore GE, Painter PL and Roberts. ACSM'S exercise management for persons with chronic diseases and disabilities (2009) Champ Hum Kinetic. https://doi.org/10.1080/01924788.2012.677794

34. Verbrugge LM. The Twain meet: empirial explanations of sex differences in health and mortality (1989) J Hel Soc Behavi 30: 282-304.

35. Cherry DK and Woodwell DA. National ambulatory medical care survey: 2000 summary. Centers for Disease Control and Prevention Advanced Data No. 328, June 5, DHHS Publication No. (PHS) 2002; 1250, 02-0379 (5/02).

36. Ell E, Camacho LAB and Chor D. Anthropometric Profile of State Bank Employees in the State of Rio de Janeiro (1999) Cad Public Health 15: 113-121. https://doi.org/10.1590/s0102-311x1999000100012

37. Gallagher D, Heymsfield SB, Heo M, Jebb SA, Murgatroyd PR, et al. Healthy percentage body fat ranges: an approach for developing guidelines based on body mass index (2000) Am J Clin Nutr 72: 694-701. https://doi.org/10.1093/ajcn/72.3.694

38. Dodd KW, Guenther PM, Freedman LS, Subar AF, Kipnis V, et al. Statistical methods for estimating usual intake of nutrients and foods: a review of the theory (2006) J Am Diet Assoc 106:1640-1650

39. Matsuto SM, Matsuto VKR and Barros TLN. Impact of aging on anthropometric, neuromotor and metabolic variables of physical fitness (2000) Braz J Sci Mov 4: 21-32.

40. Slater B. Development and validation of a semi-quantitative food frequency questionnaire for adolescents 2001 [doctoral dissertation]. São Paulo: School of Public Health, University of São Paulo.

41. Mahan LK, Escott-Stump S, and Gee M. Body Weight Control: food nutrition and diet therapy (2010) Elsevier 5: 532-562.

42. Bernardi F, Cichelero C and Vitolo MR. Dietary restriction behavior and obesity (2005) Rev Nutr 8: 1. https://doi.org/10.1590/s1415-52732005000100008

43. World Health Organization. Obesity: preventing and managing the global epidemic. Report of a World Health Organization Consultation. Geneva: World Health Organization 2000 256. https://doi.org/10.1017/s0021932003245508

44. Latin American Consensus on Obesity. Montevideo 1998.

45. Willett WC, Dietz WH and Colditz GA. Guidelines for health weight (1999) N Eng J Med 6: 427-434. https://10.1056/NEJM199908053410607

46. Amorim MMA, Santana NES, Souza AH and Santiago MC. Client adherence to nutritional obesity treatment in a school clinic (2018) Diabetes Updates 1: 1-9. https://doi.org/10.15761/du.1000109

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49