Prevalence of weight-loss strategies of young adults from the 1982 birth cohort in Pelotas, RS

Prevalência de estratégias para perder peso de jovens adultos da coorte de nascimentos de 1982 de Pelotas, RS

Abstract

The objective of this article was to identify, among the members of the 1982 birth cohort in Pelotas, those who were trying to lose weight at the age of 23, and which strategies they used. From 2004 to 2005, 4,297 individuals from the 1982 cohort were interviewed. The effects of demographic, socioeconomic and behavioral factors on the prevalence of any strategy to lose weight in the past year were assessed in a cross-sectional analysis with the Poisson regression. Out of all the youngsters interviewed, 28.5% reported having used some strategy to lose weight. In the adjusted analysis, gender, schooling, family income, body mass index and smoking were associated with the use of some strategy. The strategy used by most of the young people was diet followed by physical activity. The results showed that appropriate preventive measures and body weight control are necessary, along with public policies aimed at encouraging healthy habits among young people, including physical and dietary education.

Keywords: Adult. Diet. Weight loss. Strategy. Prevalence. Cross-sectional studies.

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Resumo

O objetivo deste artigo é identificar, entre os membros da Coorte de Nascimentos de 1982 de Pelotas, aqueles que estavam tentando perder peso aos 23 anos e quais as estratégias utilizadas por eles. Entre 2004 – 2005, foram entrevistados 4.297 indivíduos da Coorte de 1982. Os efeitos das variáveis demográficas, socioeconômicas e comportamentais sobre a prevalência do uso de estratégia para emagrecer no último ano foram analisados em uma análise transversal utilizando regressão de *Poisson*. Do total de jovens entrevistados, 28,5% referiram ter utilizado alguma estratégia para perder peso. Na análise ajustada o sexo, a escolaridade, a renda familiar, o índice de massa corporal e o tabagismo estiveram associados ao uso de alguma estratégia, sendo que a mais utilizada pela maioria dos jovens foi dieta seguida de exercício físico. Os resultados mostraram que medidas adequadas de prevenção e de controle do peso corporal são necessárias, com políticas públicas voltadas para a população jovem, incentivando hábitos saudáveis como atividade física e educação alimentar.

Palavras-chave: Adulto. Dieta. Perda de peso. Estratégia. Prevalência. Estudos transversais.

Introduction

Currently, obesity can be considered as one of the major health issues, since it is associated with several diseases[1,2]. According to the World Health Organization, more than one billion adults are overweight, and at least 300 million are clinically obese[2]. In Brazil, some studies have demonstrated the increased prevalence of obesity in several regions of the country[3-6]. Data available in the Family Expenditure Survey (*Pesquisa de Orçamentos Familiares* – POF), from 2008 to 2009, show that 12% of the Brazilian men and 17% of the Brazilian women aged 20 years old or more are with obesity[4].

A study conducted with the objective of investigating the reasons why people wished to lose weight showed that the appearance was mentioned as the main motive for the desire to be thinner by 50% of the people, followed by health (35%) and mood (15%)[7]. Whatever the reason, the fact is that studies conducted in countries like the United States or those in Europe point out that the prevalence of adults who wish to lose weight is high and similar[8-18]. Out of the studies carried out in the United States, by telephone inquiry, the proportion of people who wanted to lose weight ranged from 20% to 57%[8-10,12,14], while, in Europe, the prevalence of individuals who wished the same ranged from 19% to 66%[11,17,19]. In these studies, it was possible to observe that some aspects were associated with strategies to lose weight, especially with diet and physical exercise: female gender, being young, white, high schooling, not being smoker and being overweight[8-11,13-15,20]. On the other hand, body mass index (BMI) indicated the inverse relationship with the practice of physical exercises as a strategy to lose weight[21].

A study conducted in Brazil, with college students from the State of Pernambuco, analyzed their self-evaluation toward weight. Women reported to have been trying to lose weight more frequently, while men tried to gain it[22]. Population-based studies carried out in the city of Pelotas, in the State of Rio Grande do Sul, showed

that approximately one-quarter of the adults wanted to lose weight one year prior to the interview[23,24]. In one of the studies conducted in Pelotas[23], with adults, being a woman, non-smoker and obese have been associated with the attempt to lose weight. However, little is known about the strategies to lose weight involving young adults in Brazil.

Out of the used strategies, some studies revealed that most people go on a diet or change their eating habits in order to lose weight, followed by physical exercises[9-17,23-25]. A recent study carried out in Pelotas confirms these data. Besides, the use of substances (medicines, teas, dietary supplements) to lose weight was mentioned by 48% of the studied people, and the intake of medicine, by 18% of the interviewed adults who reported some strategy to lose weight[24]. While women reported to have more control over the diet and the use of substances, men reported doing more physical exercises to lose weight, which had already been observed in a previous population-based study conducted in the same city[23].

As suggested by WHO, the prevention and control of obesity should be carried out through an integrated and multisectoral system, including environmental support for healthy diets and regular physical activities. However, unhealthy strategies that present risks for health, such as the use of medicine[23,24] to become thinner, are still being used. It is worth to mention that, recently, amphetamine-based drugs were forbidden in Brazil. The use of drugs with sibutramine is restricted to some indications, and it should only be used as adjunct therapy as part of a weight management program for obese patients, which should be followed-up by a food education program, besides the practice of physical activities that are compatible with the conditions of the user[26].

The objective of this article was to identify, among the members of the 1982 birth cohort in Pelotas, who were trying to lose weight when they were about 23 years old, as well as the main strategies they used.

Methods

This study was conducted with a population of young adults from the 1982 birth cohort in Pelotas, Rio Grande do Sul. In that year, all of the maternity hospitals in the city were daily visited, and the mothers were interviewed right after labor. All of the births were monitored. At first, the sample included 5,914 live born babies, whose families lived in the urban zone of the city. After the perinatal study conducted in 1982, there were several follow-ups, and the details of the methodology used in this birth cohort can be found in other publications[27-30].

Between October 2004 and August 2005, a search was conducted in the city of Pelotas for all of the individuals who were born in 1982, in order to perform interviews and examinations. In this follow-up, the member of the cohort was interviewed, the mean age being 23 years old (SD ± 0.4). The proportion of located young adults was 77.4%, including the 4,297 ones whose interviews were successfully made and the 282 deaths identified until 2005. A standardized and pre-codified research questionnaire was applied with household interviews. The questionnaire included several questions, including the matter of using some strategy to lose weight in the year prior to the interview, and, afterward, if the person was on any diet, drugs, physical exercise and/or tea in order to reduce body weight. For this study, pregnancy was defined as an exclusion criterion, which excluded the 103 women who were pregnant at the time of the interview. Trained interviewers applied the questionnaire and, at the end of the interview, the anthropometric measurements were collected. The technique for this collection was based on the recommendation by Lohmann[31]. Weight measurements were obtained with portable electronic scales (Seca uniscale®, Germany), with 100 g precision. Anthropometer made of aluminum were used to measure height[32].

The affirmative response to the following question was considered as a dependent variable: "to have used some strategy to lose

weight in the past year. Independent variables included in this analyses were demographic: gender (male or female), skin color (self-reported by the youngsters and classified as white or nonwhite) and marital status (with a partner or without a partner); socioeconomic: family income (sum of the values received in reais (Brazilian currency) by all of the residents in the household in the month prior to the interview, presented in tertile) and schooling (years of study presented in four categories: zero to four years; five to eight years; nine to eleven years; twelve years or more); behavioral: BMI, obtained through body weight measured in kilograms and divided by the square height in meters, presented according to the WHO classification (low weight, BMI < 18.5 kg/m^2; adequate weight, BMI 18.5-24.9 kg/m^2; overweight, BMI 25.0-29.9 kg/m^2 and obesity, BMI ≥ 30 kg/m^2)^2, and smoking (current tobacco consumption).

Data were doubly typed and compared in the software Epi-Info 6.04 and analyzed in the statistical software Stata, version 11.2. The population was described by prevalence and respective 95% confidence intervals (95%CI). The chi-square and the linear trend tests were used to compare the proportions. The interaction test by Mantel-Haenszel was used between the use of strategies to lose weight, gender and independent variables. The effects of demographic, socioeconomic and behavioral variables on the prevalence of the strategies used to lose weight in the past year were analyzed by the Poisson regression. The adjusted analysis was in accordance with a hierarchic model to include the variables. Therefore, demographic (gender, skin color and marital status) and socioeconomic variables (schooling and family income) were included. BMI and smoking were included together in the second level of analysis. The variables of the first level of analysis are adjusted and maintained in the model if $p < 0.20$. The variables in the second level are also adjusted and, for those in the first level, kept in the model. Variables with $p < 0.05$ were considered to be statistically significant. The prevalence of all of the strategies used to lose weight was presented for the whole group and separately, for men and women, and also according to BMI.

The research project was approved by the Research Ethics Committee of *Universidade Federal de Pelotas* (OF.15/11). In the follow-up of the longitudinal study in 2004 – 2005, the Ethics Committee approved the project and included the questionnaire. All of the participants signed the informed consent form. The authors declared there is no conflict of interests concerning this study.

Results

Out of the 4,194 individuals included in this study, there was slight predominance of the male gender (52.8%). Seventy five percent of the young adults defined themselves as being white and 62% had no partners. Almost half of the sample (48%) had completed from nine to eleven school years. With regard to nutritional status, 29% of the adults had excess weight (overweight or obesity) and 6% had low weight. Most of them did not practice physical activities during leisure time (64%) and 26% were smokers.

Among the interviewees, 28.5% (95%CI 27.1 – 29.8) reported having used some strategy to lose weight in the twelve months prior to the interview. There were significant differences as to gender, since 40% (95%CI 37.7 – 42.0) of the women used some sort of strategy when compared to 18% (95%CI 16.6 – 19.9) of the men. Even though this difference between men and women was significant, interaction tests between outcome, gender and dependent variables were not significant; therefore, we chose to show the total results, including men and women.

Table 1 describes the prevalence of the use of strategies to lose weight in the whole sample and its association with demographic, socioeconomic and behavioral variables. The use of strategies was more frequent among white-skinned individuals, with increased schooling, family income and BMI, and also among young adults who were not smokers. On the other hand, marital status was not associated with the prevalence of the use of strategies to lose weight ($p = 0.17$).

After analyzing the associations between the use of strategies with the independent variables for the whole population with the Poisson regression, it was observed that the crude effects were maintained in the adjusted analysis, except for skin color (Table 2). The 12% increase in the prevalence of the use of strategies among white-skinned people disappears after the adjustment for other socioeconomic variables. The prevalence of strategies to lose weight was twice as high among women in relation to men, and only 14% higher among non-smokers in comparison with smokers. The direct relation between the increased prevalence of the use of strategies and increased schooling and family income also remained in the adjusted analysis, and it is possible to observe the more present effect of schooling than of income, when these two variables are included in the adjusted analysis of the same level. Young adults with obesity presented about three times more risk for the use of

Table 1 - Prevalence of weight-loss strategies according to demographic, socioeconomic and behavioral factors. Pelotas, 2004 – 2005.
Tabela 1 - *Prevalência do uso de estratégia para perder peso, conforme as variáveis demográficas, socioeconômicas e comportamentais. Pelotas, RS, 2004 – 2005.*

Variable	n	%	95%CI
Skin color (self-reported)			
Nonwhite	1.030	26.0	23.3 – 28.7
White	3.162	29.3	27.7 – 30.8
Marital status			
With a partner	1.580	27.2	25.0 – 29.4
Without a partner	2.612	29.2	27.5 – 31.0
Schooling (years)			
0 – 4	337	11.3	7.9 – 14.7
5 – 8	1.170	19.9	17.6 – 22.2
9 – 11	2.022	31.6	29.6 – 33.6
≥ 12	663	42.7	39.0 – 46.5
Family income (2004 – 2005)			
First tertile (poorer)	1.373	22.7	20.5 – 24.9
Second tertile	1.400	27.9	25.6 – 30.3
Third tertile (richer)	1.419	34.5	32.1 – 37.0
BMI (kg/m^2)*			
Low weight (< 18.5)	257	4.3	1.8 – 6.8
Adequate (19 – 24.9)	2.739	21.8	20.3 – 23.4
Overweight (25 – 29.9)	848	46.5	43.1 – 49.8
Obesity (≥ 30)	340	55.6	50.3 – 60.9
Smoking			
Smoker	1.080	20.7	18.3 – 23.2
Non-smoker	3.112	31.1	29.5 – 32.8
Total	4.192**	28.5	27.1 – 29.8

BMI: Body Mass Index.
*It was not possible to measure the BMI of eight participants due to lack of information of weight and/or height. **There was no information for two interviewees in 2004 – 2005 about using or not some weight-loss strategy.
IMC: Índice de Massa Corporal.
**Para oito dos entrevistados não foi possível calcular o IMC por falta de informação do peso e/ou altura. **Para dois entrevistados em 2004 – 2005 não havia informações sobre ter utilizado alguma estratégia para perder peso.*

strategies to lose weight in comparison with those on adequate weight.

The main strategies used to lose weight are presented in Table 3. Most young adults tried diet followed by physical exercises. The combination of diet and physical exercise was used by 20% of the people, while 13% were on diet pills. The least mentioned strategy was the weight-loss tea (8%). After analyzing these strategies according to gender, it is observed that the diet, the pills and the teas are mostly used by women in

Table 2 - Crude and adjusted analysis of independent variables on the use of weight-loss strategies by young people interviewed in 2004 – 2005. Pelotas, RS.
Tabela 2 - *Análise bruta e ajustada das variáveis independentes sobre a utilização de estratégia para perder peso pelos jovens entrevistados em 2004 – 2005. Pelotas, RS.*

	Variable	Crude analysis		Adjusted analysis*	
		PR (95%CI)	p-value	PR (95%CI)	p-value
	Gender		< 0.001**		< 0.001**
	Male	1.00		1.00	
	Female	2.18 (1.97–2.42)		2.06 (1.86 – 2.29)	
	Skin color (self-reported)		0.048**		0.22**
	Nonwhite	1.00		1.00	
	White	1.12 (1.00 – 1.26)		0.93 (0.83 – 1.04)	
	Marital status		0.17**		0.47**
	With a partner	1.00		1.00	
	Without a partner	1.07 (0.97 – 1.19)		0.96 (0.87 – 1.07)	
1	Schooling (years)		< 0.001***		< 0.001***
	0 – 4	1.00		1.00	
	5 – 8	1.77 (1.28 – 2.43)		1.72 (1.25 – 2.35)	
	9 – 11	2.80 (2.06 – 3.81)		2.40 (1.76 – 3.26)	
	≥ 12	3.79 (2.77 – 5.17)		2.88 (2.09 – 3.98)	
	Family income (2004 – 2005)		< 0.001***		0.006***
	First tertile (poorer)	1.00		1.00	
	Second tertile	1.23 (1.08 – 1.40)		1.09 (0.95 – 1.23)	
	Third tertile (richer)	1.52 (1.35 – 1.72)		1.22 (1.07 – 1.39)	
	BMI (kg/m^2)*		< 0.001***		< 0.001***
	Low weight (< 18.5)	0.20 (0.11 – 0.35)		0.18 (0.10 – 0.33)	
	Adequate (19 – 24.9)	1.00		1.00	
	Overweight (25 – 29.9)	2.13 (1.92 – 2.35)		2.32 (2.11 – 2.56)	
	Obesity (≥ 30)	2.55 (2.26 – 2.87)		2.71 (2.41 – 3.05)	
2	Smoking		< 0.001**		0.025**
	Smoker	1.00		1.00	
	Non-smoker	1.50 (1.32 – 1.71)		1.14 (1.01 – 1.29)	

PR: Prevalence Ratio; BMI: Body Mass Index.
*The variables in the first level were adjusted and kept in the model if p < 0.20. The variables in the second level were fit together and adjusted for the variables in the first level that maintained significance (gender, schooling and family income).
**Test for heterogeneity. ***Test for linear trend.
RP: Razão de Prevalência. IMC: Índice de Massa Corporal.
**As variáveis do primeiro nível foram ajustadas entre si e mantidas no modelo de análise se p < 0,20. As variáveis do segundo nível foram ajustadas entre si e ajustadas para as variáveis do primeiro nível que mantiveram significância (sexo, escolaridade e renda familiar). **Teste para heterogeneidade. ***Teste para tendência linear.*

Table 3 - Prevalence of the main weight-loss strategies in the year prior to the interview, according to gender. Pelotas, 2004 – 2005.

Tabela 3 - *Prevalência das principais estratégias utilizadas para perder peso no ano anterior à entrevista, de acordo com o sexo. Pelotas, RS, 2004 – 2005.*

Strategies	Total		Men (n = 404)		Women (n = 789)	
	%	95%CI	%	95%CI	%	95%CI
Diet	67.2	64.6 – 69.9	49.8	44.9 – 54.6	76.2	73.2 – 79.2
Physical exercises	47.1	44.3 – 49.9	68.8	64.3 – 73.3	36.0	32.6 – 39.4
Diet + exercise	19.7	17.4 – 22.0	18.8	15.0 – 22.6	20.2	17.3 – 23.0
Medicine	13.1	11.2 – 15.0	5.2	3.0 – 7.4	17.1	14.5 – 19.7
Teas	8.2	6.7 – 9.8	2.5	1.0 – 4.0	11.2	9.0 – 13.4

the attempt to lose weight, while physical exercises were mostly adopted by men.

In Figure 1, it is possible to observe the prevalent strategies used to lose weight according to BMI for men and women. Low weight was not included, because there were only few young adults with weight deficit using any strategy to lose weight. Physical exercise was mostly adopted by men, and diet was more used by women, and these results were also observed in all of the BMI classification categories. With regard to the diet among men, it is observed that it was mostly mentioned among those who were overweight and obese when compared to those with adequate weight, and this same result was observed for the combination of diet and physical exercises. Medicines were mostly used by obese men, while these proportions were also higher among women with adequate weight. It is worth to mention that, among women, the proportion of use of any of the strategies was similar in the three nutritional classification categories.

Discussion

The main advantage of this study is related to the fact that it refers to a young adult population representing all of the births of Pelotas in the year of 1982. This is the longest and oldest cohort study developed in medium- or low-income countries, with appropriate methods and high follow-up rates[33]. On the other hand, this study is restricted to the investigation of the used strategies, including the diet, without analyzing if such a diet is nutritionally balanced and efficient in order to lose weight. However, considering the high prevalence of excess weight in this population of young adults[34], the description of the main weight-loss strategies should contribute and lead to proper interventions to control and treat the excess weight in young populations. Also, one of the possible limitations of this study is the fact that the participants might have used more than one strategy to lose weight, and at the time of the interview they only mentioned one of the options.

Some kind of strategy to lose weight was used in the past year by almost one-third of the young adults in the 1982 birth cohort. Most inquiries conducted in high-income countries show higher prevalence[12-14,16-19,25]. It is worth to mention that, in these studies, such prevalence refers to adults of all age groups[12–14,16,25], including college students[19]. The sample of one study in Spain included three times more women than men[17]. In relation to population-based studies conducted in Pelotas, the prevalence factor was very similar to the one found in this study[23,24], as well as in the study carried out in Pernambuco, which included college students with the same mean age as the participants in this study[22].

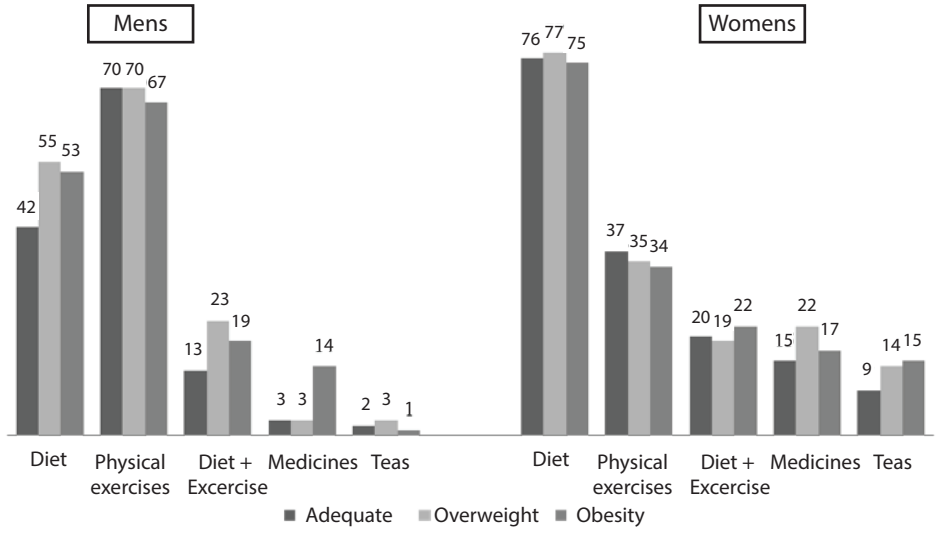

Figure 1 - Prevalence of weight-loss strategies among young people who wanted to lose weight according to body mass index for men and women. Pelotas, 2004 – 2005.
Figura 1 - *Prevalência do uso de estratégias entre os jovens que desejavam perder peso de acordo com Índice de Massa Corpórea para homens e mulheres. Pelotas, RS, 2004 – 2005.*

The associations between weight-loss strategies and socioeconomic variables show that the effects of the highest socioeconomic level are still associated, even when all of the variables are included in the model; however, the effect of schooling seems to have more impact than the effect of family income. The association between the use of weight-loss strategies and schooling was similar to the results of two studies conducted with North-Americans who were interviewed by telephone inquiries[9,12].

Regarding the associations of weight-loss strategies and nutritional status, this study shows that the strategies were used by those who actually needed them, since the prevalence of some kind of weight-loss strategy increased with the increased BMI. These results are similar to those of two studies conducted in the United States[8,12]. On the other hand, an inquiry with the population of the United States[9] showed higher prevalence of the wish to lose weight among those individuals presenting with BMI < 26 kg/m^2.

The higher prevalence of the attempt to lose weight among the non-smoker interviewees in this study had already been reported in the study of Pelotas[23]. Likewise, in the adult population of the United States, counting on physical activities as a weight-loss strategy was more frequently reported among non-smokers[10].

Therefore, as reported in other studies[8,10,12-15,20,22-25], the prevalence of weight-loss strategies is always higher among women in comparison with men. Among the women in the birth cohort, the prevalence of weight-loss strategies (40%) was similar to that observed in the Behavioral Risk Factor Surveillance System (BRFSS-1989)[8] and also to that of young college students of Pernambuco[22].

On the other hand, among men, the prevalence of weight-loss strategies was around 20%, similar to that found in individuals aged fifteen years old or more in the European Union[11]. The highest prevalence of men willing to lose weight (42%) was observed in the state of Minnesota, in the United States[14].

However, it is important to consider that, in general, women are less satisfied with their weight. Two studies carried out in the United States assessing the difference between genders with regard to

the perception and satisfaction with body weight and weight-loss strategies showed that women were more dissatisfied with their weight. Likewise, the prevalence of weight-loss strategies was higher among them[35,36]. In a study conducted in Florida[36], men were significantly more satisfied than women in relation to weight, while women used more weight-loss strategies when compared to men.

Diet and physical exercises have been the most used weight-loss strategies in this study and others[9-15,21]. However, in the study conducted in Spain[17], most participants increased the frequency of physical exercises in order to lose weight. Among the women in the 1982 birth cohort, however, most of them reported using all of the strategies to lose weight, except for physical activity, which was more prevalent among men. These results had already been presented for the adult population of Pelotas[24]. The concern about body weight was more frequently reported by the female college students of Pernambuco, and the practice of physical activities as a way to lose weight, likewise, was mostly mentioned by men[22].

By assessing the use of medicines or teas, such strategies were also mostly used by women in the cohort and in the more recent population-based study conducted in Pelotas[24], which reinforces the fact that women wish to lose weight in a negligent manner, which can expose them to non-recommended practices, such as the use of anorexigenic agents[10,23,26].

It is also important to remember that the data in this study indicate that the attempt to lose weight by combining health practices, such as diet and physical exercise, was less frequent in comparison with the separate analysis of diet and exercises, which was similar to the results found in the United States[9,15] and in the adult population of Pelotas[24].

In this study, it is important to mention that obese men presented four times more chances of using a weight-loss strategy when compared to those with adequate weight. As to obese women, they presented two times more chances than those with adequate weight. Also, after analyzing the prevalence of all weight-loss strategies according to BMI, it was observed that even with adequate weight, women use weight-loss strategies. The results suggest that the wish to lose weight among women is being less influenced by the obesity condition. This reinforces the idea that the woman, even with adequate weight, wants to lose weight, which was also demonstrated in a study with college students from Madrid[19], in which 92% of the women who wanted to lose weight had adequate BMI.

Therefore, the idea that one out of three people with mean age of 23 years old used some weight-loss strategy in the past year indicates that adequate measures are necessary and urgent. So, it is important to avoid the practices considered to be improper to lose weight by means of public policies addressed to the young population and to the population with lower socioeconomic level, since these are the ones who do not use so many weight-loss strategies. This way, it can be possible to incorporate healthy techniques and habits, such as physical activity and food education. Once this is the most adequate proposal, which presents the best results[37], it should be encouraged as the main tool of prevention and control of body weight, thus preventing the progress of obesity and its complications throughout life.

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