

SCIENTIA MEDICA

Scientia Medica Porto Alegre, v. 34, p. 1-9, jan.-dez. 2024 e-ISSN: 1980-6108 | ISSN-L: 1806-5562

http://dx.doi.org/10.15448/1980-6108.2024.1.44842

ORIGINAL ARTICLE

Eating attitudes and restrictive diets in an adult population

Atitudes alimentares e dietas restritivas na população adulta

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Received on: Jun 15, 2023. Approved on: Nov 17, 2023. Published on: Mar 13. 2024.



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Palavras-chave: dietas restritivas, restrição alimentar, comportamento alimentar.

Abstract

Aims: to investigate if individuals, who have already been and/or are still on restrictive diets, present high scores for risk of disordered eating attitudes.

Methods: a cross-sectional study was carried out online in the Research Electronic Data Capture platform using social media (Instagram and Whatsapp). The study sample consisted of 539 individuals aged over 18 years and the questionnaire was divided into three parts: sociodemographic data, questions about the practice of restrictive diets developed by the authors, and the Disordered Eating Attitudes Scale. The chi-square test was used to compare categorical variables and the Student's t or ANOVA tests were used to compare averages. The significance level adopted was 5%.

Results: the final mean in the Disordered Eating Attitudes Scale was 74.4 (SD=18.6). Individuals who had already been and/or are still on restrictive diets presented higher scores than those who had never been on this type of diet.

Conclusions: eating attitudes of individuals who adhere to restrictive diets tend to be less healthy than those who have never been on this type of diet. Our findings demonstrate an increased focus on weight-related concerns following these dietary practices, as well as the challenges faced in maintaining a desired weight.

Keywords: dietary restriction, diet modification, feeding behavior.

Resumo

Objetivos: verificar se indivíduos que já realizaram e/ou ainda realizam dietas restritivas apresentam altos escores para risco de atitudes alimentares desordenadas.

Métodos: trata-se de um estudo com delineamento transversal, com coleta de dados *online*, através da plataforma Research Electronic Data Capture divulgado nas mídias sociais (Instagram e WhatsApp). A amostra foi composta por 539 indivíduos com idade acima de 18 anos e o questionário foi subdividido em três partes: uma seção para dados sociodemográficos, outra com questões sobre a realização da prática de dietas restritivas elaboradas pelas autoras, e a última contendo a Escala de Atitudes Alimentares Transtornadas, a qual tem a finalidade de mensurar as atitudes alimentares desordenadas, avaliando crenças, pensamentos, sentimentos, comportamentos e relação com a comida. Foi utilizado o Teste qui-quadrado para comparação entre variáveis categóricas e para comparação de duas médias foi utilizado o Teste t de Student ou Teste de ANOVA para comparação de médias. O nível de significância adotado foi 5%.

Resultados: a média de pontuação final da Escala de Atitudes Alimentares Transtornadas foi de 74,4 (DP= 18,6). Com pontuações maiores para os indivíduos que já realizaram e/ou ainda realizam quando comparado com aqueles que nunca utilizaram essa prática.

Conclusões: as atitudes alimentares dos praticantes de dietas restritivas são mais inadequadas do que aquelas dos indivíduos que nunca realizaram essa prática. Do mesmo modo, demonstram um aumento na preocupação com o peso após a realização dessas dietas e a dificuldade de manter a redução do mesmo.

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Introduction

Although nutrition and food consumption has received widespread attention, there is still some resistance from professionals in the area to expand horizons beyond the dichotomies "healthy and unhealthy attitudes" or "good food and bad food (1)."

Professionals from the area should not have a reductionist perspective regarding an individual's relationship with food. They should be concerned not only with nutritional functions and fighting diseases but also with understanding the subjectivity of this issue. If professionals do not consider people's essence, affective memories, family context, cultural aspects, religious beliefs, political scenario, gender, and relationship issues, they go against health aspects (2, 3).

In this context, it is essential to consider that eating attitudes may influence food choices and health (4). These attitudes may be defined as beliefs, thoughts, feelings, behaviors, as well as environmental and internal factors influencing the relationship with food (5).

Eating disorders are defined as disordered eating attitudes and behaviors which encompass obsessive thoughts about calories and food, anger feelings when hungry, anxiety and difficulties in choosing what to eat, searching for psychological relief in food, believing in myths, and having ungrounded beliefs regarding food and weight, as well as binge eating. Dysfunctional eating attitudes, which may precede future eating disorders, may considerably impact individuals' health status, having potential health hazards (6, 7).

Restrictive diets (RD) can be used in different situations and pathologies. These diets are often necessary to treat or prevent specific episodes, such as digestive symptoms in individuals with celiac disease. However, restricting certain foods aimed at losing weight and without a nutrition professional may be harmful to health. In this way, restrictive diets play an important role in triggering and maintaining eating disorder attitudes. This article uses the following definition for RD:

Restrictive alterations, self-imposed, which change the quantity and/or quality of the consu-

med food, aiming at controlling or altering body weight. This concept may include skipping meals, fasting, decreasing intake, restricting fattening food groups, counting food calories, consuming only diet and/or light products, and all fashionable diets (detox, liquid, and magazine diets) (8).

The inappropriate use of dietary restrictions, not due to health problems but merely aesthetic objectives, may be intimately linked to the social and cultural context of beauty and aesthetics, searching for a body that fits the beauty standards dictated by society and going over health limits (8, 9). Several studies indicate that RD do not bring satisfactory results regarding losing weight in the long term. This finding may be related to the constant increase in obesity and disordered eating (10-12). In addition, several negative consequences (physical and psychological) that RD may entail are well documented, such as changes in energetic metabolism, body composition, neuroendocrine disorders, gastrointestinal alterations, and binging eating (13, 14).

It is well known that much progress has been made regarding understanding dysfunctional eating attitudes and eating disorders. However, more studies are necessary to search for efficient alternatives for these disorders. We still need to view nutrition not solely as a science concerned with food as a source of nutrients, but also within a multifaceted context.

A multidisciplinary approach is imperative to attend to individuals with eating disorders, considering attitude and disorder levels and emphasizing the meaningful role that nutritional care plays in preventing these disorders (6). Considering this context, this study aimed to verify whether individuals who were and/or still are on restrictive diets presented high scores of risks for disordered eating.

Methods

This cross-sectional study collected data using an online questionnaire on Research Electronic Data Capture (RedCap), and it was widely publicized on social media (Instagram and WhatsApp).

The study population was made up of adults older than 18 years. Illiterate individuals, as it was a self-report questionnaire and those who did not answer all the questions were excluded from the study to interpret and analyze data accurately. The sample size was calculated based on an irregular eating prevalence of 76%, according to Matos et al. (15), with a power of 80% and a sampling bias of 5 percentage points, totaling 281 individuals. We also performed another sample size calculation using the average Disordered Eating Attitudes Scale (DEAS) score of 64.6±16.7 points (16), using the same parameters mentioned above, totaling 271 individuals. The calculations were carried out separately, and to the best of our knowledge, there is no study using these two variables together in the literature.

The questionnaire is divided into three sections. The first section approaches sociodemographic characteristics, and the second section (devised by the authors) is about the practice of restrictive diets, as we did not find an instrument that assesses these types of diets in the literature. The third section used the DEAS, which measures disordered eating attitudes based on beliefs, thoughts, feelings, and behavior regarding food. This instrument was developed, validated in Brazil, and presented an adequate internal consistency – Cronbach's alpha of 0,75 – and reliability. It was found to be helpful to assess disordered eating attitudes in various populational groups and patients with eating disorders (5).

The DEAS is composed of 25 questions, divided into five subscales: (1) relationship with food; (2) concerns about food and weight gain; (3) restrictive and compensatory practices; (4) feeling toward eating; and (5) idea of normal eating. The items in this questionnaire were devised to be assessed using a Likert scale, ranging from 38 to 190 points. The higher the punctuation, the more dysfunctional/disordered the attitude toward food consumption is (5).

Body mass index (BMI) was calculated based on self-reported height and weight. We used the reference created by the World Health Organization (17) to stratify BMI, which classifies individuals into four categories: under-weight (lower than 18.5 kg/m²), eutrophy (between 18.5 and 24.9 kg/m²), over-weight (between 25 and 29.9 kg/m²), and obesity (above 29.9 kg/m²).

Data were directly stored in a dataset in RedCap and later exported to IBM SPSS Statistics 25. The categorical variables were described using absolute and relative frequencies, and numerical variables using mean and standard deviation. We used the chi-square test to compare categorical variables, the t-student test, or the ANOVA test to compare the means, and the significance level was 5%.

This study followed all regulations from the National Health Council to perform research with human beings, according to Resolution 466/18 (12), and it was approved by the Ethics Committee in Research with human beings at the Federal University of Health Science of Porto Alegre (UFSCPA), under protocol number 5.406.960. Participants provided full informed consent and were also informed about the objectives of the study and procedures.

Results

A total of 539 individuals participated in the study, mostly females between 18 and 63 years of age. **Table 1** presents the complete description of the sample and compares the variables between the group following restricted diets and the one not following them. Regarding sex, just 8 male volunteers participate in the study. Regarding sex, age, marital status, occupation, and height, there was no significant difference between the groups which had already been and/or were still on restrictive diets compared to those who had never been on such diets. However, race, schooling years, country regions, weight, BMI, and BMI classification presented significant differences between the groups.

Variables	Total Sample (N= 539)	With RD (N=324)	Without RD (N=215)	Р
Age	28.1 <u>+</u> 6.1	28.38 <u>+</u> 5.8	27.8 <u>+</u> 6.7	0.28
Ethinicit white	420 (77.9)	262 (62.4)	158 (37.6)	0.04 [‡]
Marital status: with a partner	331 (61.4)	197 (59.5)	134 (40.5)	0.72 ⁺
Schooling				0.02 [‡]
Primary school	8 (1.5)	4 (50.0)	4 (50.0)	
Secondary School	137 (25.4)	65 (47.4)	72 (52.6)	
Undergraduate	394 (73.1)	255 (64.7)	139 (35.3)	
Ocupation: with an income	325 (60.3)	206 (63.4)	119 (36.6)	0.06+
Country region				0.04 +
South	296 (54.9)	186 (62.8)	110 (37.2)	
Southeast	155 (28.8)	95 (61.3)	60 (38.7)	
Center-west	30 (5.6)	12 (40.0)	18 (60.0)	
Northeast	48 (8.9)	28 (58.3)	20 (41.7)	
North	10 (1.9)	3 (30.0)	7 (70.0)	
Weight (kg)	72.1 <u>+</u> 16.9	76.3 <u>+</u> 17.3	65.9 <u>+</u> 14.1	≤0.001 [°]
Height (m)	1.64 <u>+</u> 0.07	1.64 <u>+</u> 0.07	1.63 <u>+</u> 0.07	0.57 [.]
BMI (kg∕m²)	26.9 <u>+</u> 5.9	28.4 <u>+</u> 6.2	24.7 <u>+</u> 0.33	≤0.001 [°]
BMI classification				≤0.001 [‡]
Underweight	10 (1.9)	4 (40.0)	6 (60.0)	
Eutrophy	230 (42.7)	108 (47.0)	122 (53.0)	
Overweight	167 (31.0)	108 (64.7)	59 (35.3)	
Obesity	132 (24.5)	104 (78.8)	28 (21.2)	

TABLE 1 – Adult Sociodemographic and anthropometric characteristics Brazil, 2022.

BMI, body mass index; RD, restrictive diet. ⁺ Student's t-Test. ⁺Chi-square Test.

Table 2 shows the complete description of thequestionnaire regarding the practice of restrictivediets. It is worth highlighting that the remainingfive questions would follow if participants answe-

red the first question about performing restrictive diets positively. If not, participants would be directed to the next section.

TABLE 2 - Description of restrictive diets among adults. Brazil, 2022.

Variables	Total N(%)
Have you ever been on a restrictive diet?	324 (60.1)
How many times did you start a restrictive diet?	
Only once	45 (13.9)
Between 2-3 times	101 (31.2)
Between 4-10 times	108 (33.3)
More than 10 times	70 (21.6)
If you lost weight on a restrictive diet, how long did you keep your reduced weight?	
Less than 1 month	74 (22.6)
From 1 to 3 months	89 (27.6)
From 3 to 6 months	66 (20.4)
More than 6 months	44 (13.6)
More than 1 year	51 (15.8)
Did you notice that your concern with weight increased after being on any type of	
restrictive diet?	
Yes	249 (76.9)

Variables	Total N(%)
No	33 (10.1)
Did not notice	42 (13.0)
What was your main food behavior change when on a restrictive diet?	
Decrease calory intake	160 (49.4)
Restriction of some food groups	147 (45.4)
Other	17 (5.2)
What was your aim when you started a restictive diet?	
Body weight control	15 (4.6)
Body weight reduction	298 (92.0)
Other	11 (3.4)

TABLE 2 – Description of restrictive diets among adults. Brazil, 2022 (cont.).

Results were significant in all scales and subscales when analyzing the practice of restrictive diets, except for subscale 5, which was about the idea of normal eating. **Table 3** presents the complete score and the comparison between participants on restrictive diets with those who were not. **Table 4** brings the relationship between the number of times participants performed restrictive diets and the score for disordered eating attitudes. We observed that the more frequently participants performed restrictive diets, the higher their scores for disordered eating attitudes.

TABLE 3 – Total and subscale scores comparing individuals who are or have been on restrictive diets and those who have never been on this type of diet. Brazil, 202.

Subscales	Total Score	On RD	Not on RD	P*
Relationship with food.	25.4 <u>+</u> 11.4	28.7 <u>+</u> 12.0	20.4 <u>+</u> 8.3	≤0.001
Concerns about food and weight gain.	7.2 <u>+</u> 3.3	8.1 <u>+</u> 3.6	5.9±2.3	≤0.001
Restrictive and compensatory practices	6.8 <u>+3</u> .8	7.7 <u>+</u> 4.2	5.5 <u>+</u> 2.5	≤0.001
Feeling toward eating	3.6 <u>+</u> 1.9	3.8 <u>+</u> 2.1	3.4 <u>+</u> 1.3	0.04
Idea of normal eating	29.0 <u>+</u> 7.3	28.6 <u>+</u> 7.1	29.6 <u>+</u> 7.5	0.125
Total DEAS	74.4 <u>+</u> 18.6	79.1 <u>+</u> 19.6	67.2 <u>+</u> 14.1	≤0.001

DEAS, Disordered Eating Attitude Scale; RD, restrictive diet. *Student's t-Test.

TABLE 4 – Comparison between the number of times individuals were on any type of restrictive diet with the total DEAS score. Brazil, 2022.

Variables	Total Score	Р
Only once	70.6 <u>+</u> 17.2	≤0.001 [°]
2-3 times	76.1 <u>+</u> 16.7	
Between 4-10 times	79.6 <u>±</u> 19.5	
More than 10 times	88.4 <u>+</u> 21.8	
Total DEAS	79.1 <u>+</u> 19.6	

DEAS, Disordered Eating Attitude Scale; * ANOVA Test.

Finally, we also investigated whether participants' concern about body weight was related to a higher score for the risk of disordered eating attitudes. Our findings showed that participants concerned with body weight presented higher total score and higher scores in the following domains: relationship with food, concerns about food and weight gain, and restrictive and compensatory practices.

Discussion

The present study aimed to investigate the possible association between restrictive diets and the high score for the risk of disordered eating attitudes. To the best of our knowledge, this is the first study to investigate eating attitudes in relation to restrictive diets in an adult population.

Our findings have shown that individuals who performed and/or still perform restrictive diets presented significantly higher disordered eating attitude scores than those who did not. Evaluating the differences between males and females was not feasible due to the reduced number of male participants. Thus, applying any statistical test was not possible since assumptions would not be met. In this context, the specific health area investigated in this study may explain the small number of male participants. Studies regarding disordered eating attitudes are more prevalent among women than men (19-22).

Vasconcellos et al. (23) assessed ballet dancers of both sexes who were members of professional dance companies in the southern and southeastern regions of Brazil and found an eating attitude score for men of 71.1±12.4 and for women of 67.5±15.8, not establishing a significant difference between males and females. Silva and Koritar (24), when analyzing weightlifting and functional training practitioners, found a total average score in the questionnaire of 68.1±15.9. The authors' findings are in accordance with Vasconcellos et al. (23), who did not find any significant difference between the sexes.

On the other hand, Privitera and Dickinson (25) examined college athletes from various sports, reaching a total average score of 50.4±11.2). Female athletes, who presented a more significant score, reached 52.7±9.9, and male athletes 47.8±12.1. Claumann et al. (26) also investigated resistance training practitioners and found a total average score of 70.0±15.2, also presenting a significant difference between sexes, 64.98±14.4 for male practitioners, and 74.7±14.5 for female practitioners.

Alvarenga, Scagliusi, and Philippi (27) conducted another study using DEAS. They compared eating attitudes among Brazilian female college students from the five regions of the country and found a total average score of 64.6±16.7. Alvarenga et al. (28) assessed the psychometric properties of DEAS among male college students from São Paulo and Minas Gerais in a study conducted only with males. Individuals without the risk of developing eating disorders presented a total average score of 55.8±10.2 using EAT-26 (score <21) and 78.7±14.6 for those at risk (score > 21). This study also presented a score for the population diagnosed with eating disorders, which was 105.4±27.8, showing the great difference between the populations with and without this diagnosis.

DEAS is a tool that does not present a cut-off point to identify a risk behavior for eating disorders. The validation article of this tool only considers higher scores indicating more dysfunctional eating attitudes, in which the total scale varies from 38 to 190 points (5). Both studies previously mentioned presented a total male score of 71.1±12.4 (23), and a total average of 70.0±15.2 (26). Results suggested that participants did not present disordered eating attitudes and had a low risk of developing eating disorders. Considering our findings, we could also conclude that the results do not indicate harmful attitudes toward health. However, it is worth noting the considerable difference in scores between the population on restrictive diets and those not on RD. Further studies are needed with these groups to confirm the impact of restrictive diets on individuals' eating attitudes.

The results of the investigation on restrictive diets bring important data to be analyzed and discussed. Individuals who never underwent RD had an average BMI classified as eutrophic, while those who underwent RD presented an average BMI considered overweight. Specifically analyzing the results of participants who have already performed and/or are still following restrictive diets, most performed this type of diet to reduce body weight, and more than half remained with the reduced weight for a maximum of six months. This last finding correlates with a result found in the study by Crujeiras et al. (29), which investigated weight recovery after an eight-week hypocaloric diet-induced loss, in which of the 104 research volunteers, 49 (47.1%) regained at least 10% of the lost weight when they were re-evaluated 32 weeks later.

In addition to the points previously discussed, another point that draws attention is the fact that the concern with weight increased significantly after performing this practice. This finding agrees with the results of subscales 2 and 3, which deal with concerns about food and weight gain and restrictive and compensatory practices, respectively. Both participants who had already performed some type of restrictive diet obtained higher and significant scores in relation to participants who had never performed this type of diet.

Individuals who successfully maintain weight loss vary according to the definition of "successful weight loss maintenance." In a study aiming at defining this parameter, Wing and Hill (30) proposed a definition of the intentional loss >10% of the initial weight, maintaining it for at least one year. In the same study, approximately a quarter of overweight/obese people reported successfully maintaining weight reduction.

Finally, another finding of the present study was to identify that the DEAS scores increased statistically and significantly according to the increase in the number of times an individual underwent a new restrictive diet, proving a greater risk of disordered eating attitudes with each newly implemented RD. In this context and making an association with the maintenance of weight loss previously discussed, two literature reviews, by Greenway (11) and Maclean et al. (12), show that restricting food through diet commonly leads to successful weight loss in the short term. However, in the long term, many regain part or all lost weight. This finding shows that restrictive diets are not individually effective, requiring a series of other changing behaviors to maintain weight.

The small sample size of male volunteers can initially be considered as a limitation of this study, making comparisons of the variable sex unfeasible. It would be interesting and important to compare both sexes as more studies are conducted with women than men. It is also important to point out that there was no inclusion of a question in the sociodemographic data collection section that distinguished vegetarians from non-vegetarians since the DEAS brings questions related to meat consumption. This question may have biased the response of some participants. Another limitation is using self-reported anthropometric measurements, such as weight and height. We did not aim to evaluate other lifestyles and dietary characteristics. However, this could be further explored as different lifestyles and dietary characteristics may interweave, affording a more complex picture of this association.

In turn, the present study has as strong points the sample size, using of a tool that encompasses a broader and more complete concept of eating attitudes, considering beliefs, thoughts, feelings, behaviors, and relationship with food, unlike other validated questionnaires and widely used. In addition to adding to the literature an important agenda on the discussion of the practice of restrictive diets, including specific groups - RD practitioners and non-practitioners - yet to be studied.

In conclusion, the eating attitudes of RD practitioners are more inadequate than those of individuals who have never engaged in this practice. There is an evident rise in weight-related concerns following the adoption of such diets, accompanied by challenges in sustaining weight reduction. More studies are needed to distinguish between these groups, and it would be recommended to investigate a cutoff point for the DEAS. This would help establish clearer criteria for identifying the risks associated with disordered eating attitudes, reducing subjectivity in the assessment process.

Notes

Funding

This study did not receive financial support from external sources.

Conflicts of interest disclosure

The authors declare no competing interests relevant to the content of this study.

Authors' contributions

All the authors declare to have made substantial contributions to the conception, or design, or acquisition, or analysis, or interpretation of data; and drafting the work or revising it critically for important intellectual content; and to approve the version to be published.

Availability of data and responsibility for the results

All the authors declare to have had full access to the available data and they assume full responsibility for the integrity of these results.

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Os textos deste artigo foram revisados pela SK Revisões Acadêmicas e submetidos para validação das autoras antes da publicação.