

EATING BEHAVIOR OF LOW-CARB DIETERS

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Abstract: Introduction: The search for weight control causes new fad diets to appear periodically, having food restriction as a common point. The indiscriminate adherence to these practices can generate risk behaviors for eating disorders. Objective: To describe the eating behavior of low-carb diet practitioners. Methodology: To identify the practice and frequency of the diet, a questionnaire adapted from Oliveira, Figueredo and Cordás was used. Eating behavior was analyzed using the Eating Attitudes Scale (EAAT) and, for body dissatisfaction, the Kakeshita silhouette scale was used. Results and discussion: The survey had 58 participants, 93.1% women, with a mean age of 31.62 years (SD=11.53) and a BMI of 23.88 kg/m² (SD=4.44). Among these, only 7 were considered for analysis since they were the ones that followed low-carb. 71.42% (n=5) stated that they were more concerned about weight and body shape after starting the diet. The EAAT score was high, as well as factors 1, 2, 4 and 5. Only 14.28% of participants were satisfied with their body image. The EAAT score showed a positive correlation with the level of body dissatisfaction and no association was found between the BMI value and the discrepancy in the silhouette scale (p-value=0.73). Final considerations: The high prevalence of concern about body image in practitioners of low-carb diets is highlighted, which can lead to risk behaviors for eating disorders. Because the BMI and the discrepancy in the silhouette scale are independent variables, even people with a good nutritional status showed body dissatisfaction.

Keywords: Low carb diet. Fashion Diets. Body Dissatisfaction.

INTRODUCTION

The current aesthetic standard that focuses on enhancing thin bodies causes great body dissatisfaction, making this incessant search for weight control influenced by sociocultural factors. The periodic emergence of new “fashion diets” (such as low-carb, intermittent fasting, use of shakes, etc.) has in common the reinforcement of food restrictions. However, indiscriminate adherence to these restrictive eating practices can generate dysfunctional eating behaviors that are triggers for the development of eating disorders.

SEARCH PROBLEM

Recently, one of the fad diets that had the most adherence was the low-carb diet, which, like all diets, can deteriorate the quality of life of its practitioners and lead to unhealthy eating practices.

Considering the metabolic and psychological problems that the indiscriminate implementation of restrictive fad diets can bring and the risk behaviors for eating disorders, the need to identify these unhealthy practices early is proven. Thus, health professionals must be aware of these problems and attentive to distorted attitudes in eating behavior.

GENERAL AND SPECIFIC OBJECTIVES

To describe the eating behavior of low-carb dieters.

Evaluate body dissatisfaction rates in low-carb diet practitioners;

Classify the nutritional status according to the Body Mass Index (BMI);

Identify the presence of purgatory practices;

Check risk behaviors for the development of eating disorders.

THEORETICAL REFERENCE

The term diet can be described as a restriction of the amount of food ingested with the aim of reducing or maintaining body weight and shape. For this to happen, signs of physical hunger and desire for food are ignored, so that you eat less than usual (SOIHET; SILVA, 2019).

According to the American Dietetic Association (2006), eating disorders (ED) are diseases with diagnostic criteria based on behavioral, psychological and physiological characteristics, having a considerable impact on the health of affected individuals. The classification of these disorders addresses three main groups of psychopathologies: Anorexia Nervosa (AN), Bulimia Nervosa (BN) and Eating Disorder Not Otherwise Specified (TASOE), including Binge Eating Disorder (BED). ED are usually related to an excessive concern with body image (BI) resulting in self-imposed behaviors, such as reduced food intake or vomiting after meals (AMORIM, 2019).

Studies have pointed to an increase in the incidence of ED, but there is no consensus, and this growth may be related to greater knowledge of these disorders. There is also underreporting, which is common in these cases, since usually only the most serious cases seek a specialized service. (PRISCO et al., 2012). It is estimated that 0.5 to 4% of women develop AN and 1 to 4.2% develop BN, with the incidence of ED being higher in women than in men (CARMO; PEREIRA; CÂNDIDO, 2014). The study by Prisco et al. (2012), who evaluated 1273 Brazilian workers from Feira de Santana (BA), of both sexes and over 15 years of age, corroborates these data. This study intended to verify the prevalence of BN and BED in workers and, in that sample, there was a prevalence of 4.3% of Binge Eating Disorder and 1% of BN. Despite the low prevalence, these disorders

have high rates of morbidity and mortality (PRISCO et al., 2012).

A study carried out by Ata and Berit (2001) in Sweden with 1157 women aged 18 to 30 years, found a prevalence of ED of 3.2%. SWANSON et al., 2011 found the prevalence of the appearance of AN throughout life was 0.5 to 1% and that of BN was 0.5 to 3%. Smink, Hoeken and Hoek (2012) in a bibliographic review describe that 0.9% of young women had AN throughout their lives while for BN, the prevalence was 0.9 to 1.5% among women and 0.1% to 0.5% among men. For ACT, lifetime prevalence was 3.5% for women and 2% for men.

Risk behaviors for ED, such as the presence of food restriction and/or binge eating, have different terminologies such as suspected ED, risk for ED or, according to the American Psychiatric Association and American Dietetic Association, disordered eating - this being last term encompasses the entire spectrum of abnormal eating behaviors, from dieting to ED per se (LEAL et al., 2013)

Lira et al. (2017) define body image (BI) as the body image built in the mind and the feelings, thoughts and actions related to the body, being influenced mainly by parents, friends and the media. Silva et al. (2018), point out that there is a relationship between dissatisfaction with HF and the development of eating disorders (ED).

Currently, the aesthetic standard is based on lean and/or shapely bodies, without imperfections, which leads a large portion of the population to be excessively concerned with weight and body shape (WITT; SCHNIDER, 2011). The ideals of thinness and the current unrealistic standards of beauty, conveyed mainly by the media – social networks, magazines, television and movies – end up being internalized in individuals. According to Lira et al. (2017),

internalization is the process in which external behavior patterns become internal and, then, guide the person's behavior. Thus, the media, being a quick source of information about beauty and weight loss, plays an important role, leading to the creation of standards that are impossible to achieve about what constitutes an attractive physical appearance (PEDERSEN; HICKS; ROSENRAUCH, 2018).

The divergence between the real body and the imposed ideal standard increases the search for alternatives for fast weight loss by the population (PEREIRA JUNIOR; CAMPOS JUNIOR; SILVEIRA, 2013). and this, associated with sociocultural pressure to achieve such ideals (due to body dissatisfaction), generates adherence to unhealthy and very dangerous weight loss eating practices (PEDERSEN; HICKS; ROSENRAUCH; 2018).

Recently the low-carb (LC) diet has emerged as an adapted version of the "protein diet" or "Dr. Atkins", being characterized by low carbohydrate intake (30 to 130g/day), with or without caloric restriction, fats and proteins (OLIVEIRA; FIGUEREDO; CORDÁS, 2019).

Noto et al. (2013), in a systematic review carried out with 272,216 people who followed CL, showed that this diet favored a reduction in fiber and fruit consumption and an increase in the intake of protein from animal sources, cholesterol and saturated fats. Thus, the author points out that it may increase risk factors for mortality from cardiovascular disease in the long term.

Fung et al. (2010), in a survey that analyzed data from 85,168 women (aged between 34 and 59 years old) for 26 years and 44,548 men (aged 40 to 75 years old) for 20 years, all without heart disease, cancer or diabetes, with the aim of After examining the association between LC and mortality, it was found that consumption of an LC diet based

on animal protein sources is associated with an increased risk of mortality. Seidelmann et al. (2018), in a prospective cohort study, with 15,428 adults between 45 and 64 years old, showed a long-term negative association between life expectancy and LC, when the origins of the food consumed are not taken into account, confirming the possible adverse effects on the long-term health of followers of this diet.

Fung et al. (2010) and Seidelmann et al. (2018) corroborate the findings of Noto et al. (2013), showing that the decrease in the consumption of grains, fruits and vegetables and the consequent increase in protein and fat from animal sources in the LC diets were associated with higher mortality for all types of diseases, in addition to suggesting an increase in the inflammatory reaction and of oxidative stress.

The excess of information available to individuals on websites and social networks makes people have the impression that they know exactly what to eat to have a healthy life, however, most of the time such information is distorted, leading to the adoption of unbalanced diets and the rise of eating disorders. (PELLERANO; GIMENES-MINASSE, 2015).

METHODOLOGY

This is a cross-sectional observational study of dieters over 18 years of age, carried out between 2021 and 2022. Sampling was carried out for convenience based on the dissemination of the form on social networks, such as specific groups on Facebook® and WhatsApp®.

The establishment of inclusion and exclusion criteria in a research is a standard and necessary procedure and, in the present study, the selection of eligible participants will be based on belonging to the target population and voluntary consent to participate in this

research. The established exclusion criteria will be the non-completion of the Free and Informed Consent Term and not performing the LC diet.

To assess the nutritional status, the body mass index (BMI) was calculated with the self-reported weight (kg) and height (square meters) variables, using the cutoff points established by the World Health Organization (WHO, 1995). The instrument used to identify the practice and frequency of CL among the participants was a questionnaire with 5 questions adapted from the research developed by Oliveira, Figueredo, and Cordás (2019), created following the model proposed by the questionnaire by Hay (1998), which measured the frequency of binge eating and compensatory practices in the last three months.

Eating behavior was analyzed according to the Eating Attitudes Scale (EAAT), consisting of 25 questions, organized both for dichotomous answers and in a Likert-type scale, which consists of a summation system of scores that provides answers with a uniform interpretation. The minimum score is 37 points and the maximum is 190, and the higher the points, the more dysfunctional the eating attitudes. This scale has five subscales: “relationship with food”; “concern about food and weight gain”; “restrictive and compensatory practices”; “feelings about food”; and “normal eating concept”.

Regarding the score, for the dichotomous items, 1 point was attributed to “yes” and 5 points to “no”. As for the Likert-type items, the scores were: 1 for “rarely/never”, 2 for “sometimes”, 3 for “often”, 4 for “usually” and 5 points for “always”. However, for questions 1 and 12, a 3-point scale (1, 3 and 5) was applied, with anchors 1 for “people must eat this food often” and 5 for “people must never eat this food”. food”. If the individual answered “people must eat this food sometimes” he/

she scored one point in question 1a and 3 points in questions 1b and 1c. In question 12, the anchors were 1 for “restart eating normally”, 3 for “assuming you have lost control and continue to eat even more, or go on a diet to compensate” and 5 for “use some compensatory practice as an activity physical activity, vomiting, laxatives or diuretics” (ALVARENGA, SCAGLIUSI, PHILIPPI, 2010).

The criterion used to evaluate the body dissatisfaction index was the scale of silhouettes adapted for the Brazilian biotype, made by Kakeshita (2008). represents your current size and then the figure you would like to have. The discrepancy between the current body perception and the size you would like to have, the one seen as possible and achievable for yourself, is accepted as a measure of body dissatisfaction (KAKESHITA, 2008).

For statistical analysis, organization and tabulation of data, Microsoft Excel® version 2016 was used. The adopted significance level was 5% ($\alpha = 0.05$) for all analyses, and the descriptive variables were presented in the form of tables and graphics.

To analyze the correlation between the EAAT score and the score obtained by the discrepancy in the Silhouette Scale test, Pearson’s correlation coefficient (r) was calculated. The chi-square test was applied to analyze the association between the nutritional status of the participants in relation to the frequency of participants classified as satisfied and dissatisfied with their body image using the Silhouette Scale.

Data collection was performed using the Google Forms® virtual platform. Participation was voluntary and expressed through the signing of the Free and Informed Consent Form (TCLE) before completing the online questionnaires, and the research project was approved by the Ethics Committee for Research in Human Beings (CEP) of

Universidade Presbiteriana Mackenzie (CAAE 51167321.8.0000.0084). The research guaranteed the participants' anonymity and confidentiality, as well as respecting legislation number 466/12 of the National Health Council on ethics in research with human beings.

RESULTS AND DISCUSSION

58 practitioners and non-practitioners of fad diets participated in the survey, most of whom were female. 93.1% (n=54). Mean age was 31.6 (SD = 11.53; min: 18 and max: 59) and mean BMI was 23.88 kg/m² (SD = 4.44; min: 17.3 and max : 37.1).

The literature shows that women are the most susceptible public for the development of inappropriate eating behaviors to reduce weight. The media leads them to believe that obtaining a thin body that is within the ideal aesthetic standard would be the key to success, acceptance and happiness (SHUWEN; ORDOÑEZ; FERNANDES, 2020).

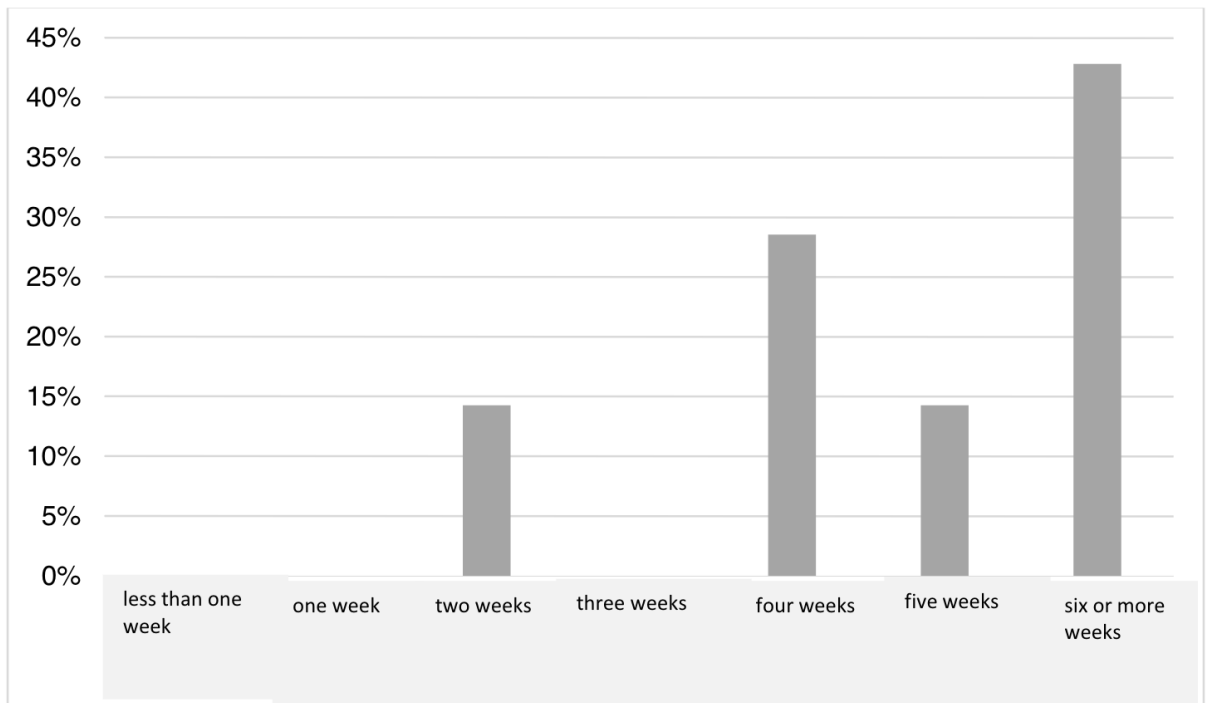
Currently, there is a great offer of fad diets due to the urgency for quick and easy weight loss. This is due to the population's incessant search for satisfaction with their own bodies and a feeling of belonging to the imposed beauty standard, especially for women. One factor that can generate this body dissatisfaction is the dissemination of a single standard of beauty by the media and social networks without proper supervision of what is disclosed. Thus, the ease of access to information without scientific basis on food and ways to lose weight quickly has been causing harm to society (FOCHESATTO, 2020; ABREU et al. 2013; SOIHET; SILVA, 2019). Among the survey participants, 44.8% followed Instagram profiles with tips for weight loss and about the fitness world in general. Therefore, media pressure and constant exposure to bodies with unrealistic standards and often digitally modified

increase dissatisfaction with one's own body and can lead to numerous harms.

Among the interviewees, 36.2% (n=21) said they were on a diet, and among these, 33.3% (n=7) were on CL, followed by a vegetarian/vegan diet (23.8%; n=5), food reeducation (14.2%; n=3), gluten restriction (9.5%; n=2) and "mixed", "diet for hypertrophy", "self-control" and "intermittent fasting" with 4, 7% (n=1).

Furthermore, unlike Fochesatto (2020), whose 75% of the sample reported using the internet as a form of dietary guidance, in our sample no CL practitioner reported using the internet for this purpose. The vast majority of this research (85.71%, n=6) were instructed by a nutritionist or doctor to follow the CL, while 14.28% (n=1) claimed self-prescription. In fact, the participant who stated that he had not gone to a consultation to start the CL was the only one who was dissatisfied with the result of the diet because he did not lose weight. It must be borne in mind that dietary prescription is the sole and exclusive activity of the nutritionist and, therefore, according to CFN Resolution No. 600/2018, physicians are not authorized to provide such assistance.

Among LC diet practitioners, 85.71% (n=6) were committed to the diet, which is corroborated by the data in graph 1, since most practitioners remained on LC four or more weeks in the last three months. Also, 85.71% (n=6) stated that they were satisfied with the result of the current LC diet. However, Nogueira et al. (2016) showed that, although fad diets are ineffective in maintaining weight loss for longer than a year, most practitioners rate their gains as very good, possibly due to the short-term result they offer..



Graph 1 – Practice time (weeks) of low-carb diet (LC) practitioners in the last three months, SP, 2022.

Source: by the authors.

In the present study, the mean BMI of the LC diet practitioners was eutrophic (table 1) and only 1 (14.28%) was satisfied with her body image according to the silhouette scale. This proves that even those with adequate nutritional status are led to body dissatisfaction, which causes them to start strategies to try to reverse this situation, such as restrictive diets and the use of practices harmful to health (for example, the use of laxatives, fastin, excessive physical activity) (SHUWEN; ORDOÑEZ; FERNANDES, 2020).

Such body dissatisfaction found is considered a risk factor for the development of ED, including being one of its diagnostic criteria (APA, 2014). It may be related to low self-esteem, anxiety, depression, lower quality of life, comparisons with other people's bodies, and also the search for weight loss and control through the adoption of restrictive diets, such as low-carb (FOCHESATTO, 2020).

Gender	n (%)
Female	7 (100%)
BMI	
Low weight	0 (0%)
Eutrophy	4 (57,14%)
Overweight	1 (8,16%)
Obesity	2 (28,57%)
Total	7 (100%)

Table 1 - Percentage distribution according to gender and nutritional status of participants who performed the LC diet (n=7), SP, 2022.

Source: by the authors.

In addition, in the last year, 3 CL practitioners (42.85%) reported following more than one type of diet and after starting it, 71.42% (n=5) stated they were more concerned with weight and body shape. Such a high prevalence of concern about body image among LC diet practitioners in this research converges with the results of Oliveira, Figueiredo and Cordás (2019),

which pointed out that in the LC diet group, the majority (71.03%) increased concern with weight and body shape confirming that diets worsen body dissatisfaction.

As for the eating behavior of the interviewees in this study, table 2 shows that the total EAAT score was, on average, 63.25 among all research participants, and among practitioners of the LC diet the value was 63.85. The score for the factors “relationship with food”, “concern about food and weight gain”, “feelings about food” and “concept of normal eating” was also higher in those who underwent CL.

	% (± dp)
EAAT Total*	63,85 (± 10,76)
Relationship with food	26,85 (± 8,19)
Preoccupation with food and weight gain	10,57 (±3,99)
Restrictive and compensatory practices	12,28 (± 3,72)
Feelings about food)	4,14 (± 3,02)
Concept of normal eating	9,42 (± 2,76)

Table 2 - Scale of Eating Attitudes (EAAT) of research participants who performed a Low Carb (LC) diet, SP, 2022.

Source: by the authors.

In table 2, it can also be seen that most of the values were high among individuals who were on the LC diet, in line with data from the research by Faria, Almeida and Ramos (2021), which showed that weight loss strategies are the main precipitating factors in AD, increasing the risk by 18 times for the development of AD. This is even more evident in restrictive diets, as the habit of frequently being on food restrictions is already a characteristic of ED. These unhealthy practices for weight control, such as eating very small amounts of food or skipping meals, also generate hormonal imbalances in the body, which leads to, for example, anxiety, depression, nervousness, obsession with food, decreased satiety,

increased hunger, anguish, guilt, loss of control over food intake (FARIA, ALMEIDA, RAMOS, 2021).

Because the score on factor 5 “concept of normal eating” is not so high, it can be inferred that this is related to current opinions about body and diet. Currently, all populations, regardless of sex or age, are exposed in some way to what is considered beauty and how to achieve it. A lean and “beautiful” body would be possible to obtain through a “healthy” diet that restricts the intake of certain food groups and the consumption of those rich in fats and sugars, such as carbohydrates (ALVARENGA et al., 2013).

However, in factor 3 “restrictive and compensatory practices” the participants who did CL did not have high values. Also, regarding the issue of purgatory practices, only 1 CL practitioner (14.28%) reported assuming the loss of control and continuing to eat even more or go on a diet to compensate after eating a larger amount of food than usual. However, it is noteworthy that Soihet and Silva (2019) and Dayan et al. (2019) state that there is no healthy restrictive diet since its practitioners do not have a good psychological health due to the impositions that the way of eating requires. concept of normal eating” LC practitioners scored high.

Furthermore, the total EAAT score showed a positive correlation ($r=+ 0.45$) with the level of body dissatisfaction and no association was found between the BMI value and the difference in silhouette scale values ($p\text{-value}=0, 73$). This demonstrates that the discrepancy in the scale and the BMI are independent variables and, therefore, even people with a healthy nutritional status showed body dissatisfaction.

Despite the small number of participants, the data can contribute to future studies with an assessment of food consumption associated with behavioral parameters.

FINAL CONSIDERATIONS

We highlighted the high prevalence of concern about body image in those who follow the LC diet, which can lead to risk behaviors for eating disorders. It is also noteworthy that, due to the fact that BMI and discrepancy in the silhouette scale are independent variables, even people with a good nutritional status showed body dissatisfaction. Thus, health professionals must be aware of these problems and attentive to distorted attitudes in eating behavior so that fewer dysfunctional eating-related behaviors occur in society.

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