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Instruments for Binge Eating Assessment in Adults: a Systematic Review

Instrumentos para avaliação da compulsão alimentar em Adultos: uma revisão sistemática

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Abstract

Objective: The aim of this study was to systematically review the methodologies used for BE evaluation/identification diagnosis in clinical trials (CT) with adults. Methods: The search was performed on PUBMED until July 2018. The PRISMA statement was used to improve the reporting of results. Results: 93 CTs were included among the 225 studies retrieved. The main BE evaluation/identification methods used in studies were: Binge Eating Scale; Diagnostic and Statistical Manual of Mental Disorders; Eating Disorder Diagnostic Scale; Eating Disorder Examination; Eating Disorder Examination Questionnaire; Eating Disorder Inventory; Loss of Control Over Eating Scale and Three-Factor Eating Questionnaire. Overlaps between methods were observed in studies, 61 used both DSM and an evaluation instrument, 06 only DSM and 26 only standardized questionnaires to assess BE disorder. Conclusions: The DSM-5 diagnostic criterion for binge eating disorder is considered excellent and widely used, however, when the objective of the study is to identify emotional, nutritional and qualitative issues, a questionnaire or interview about subjective perceptions can be used in a complementary way.

Keywords: *Diagnostic criteria. Binge eating. Binge eating diagnosis*

Resumo

Objetivo: O objetivo deste estudo foi revisar sistematicamente as metodologias utilizadas para avaliação/identificação da compulsão alimentar em ensaios clínicos com pacientes adultos. Métodos: A busca foi realizada no PUBMED até julho de 2018. Foi utilizado o protocolo PRISMA para reportar os resultados. Resultados: Foram incluídos 93 ensaios clínicos dentre os 225 que foram encontrados na busca da literatura. Os principais métodos de avaliação / identificação da compulsão alimentar utilizados nos estudos foram: *Binge Eating Scale*; Manual Diagnóstico e Estatístico de Transtornos Mentais; Escala de Diagnóstico de Transtorno Alimentar; Exame de Transtorno Alimentar; Questionário de Exame de Transtorno Alimentar;

Inventário de Desordens Alimentares; Escala de Perda de Controle sobre a Alimentação e Questionário de Alimentação de Três Fatores. Foram observadas sobreposições entre os métodos nos estudos, 61 utilizaram o DSM e outro instrumento de avaliação, seis estudos utilizaram apenas o DSM e 26 apenas questionários padronizados para avaliar o transtorno de compulsão alimentar. Conclusão: O critério diagnóstico do DSM-5 para o transtorno de compulsão alimentar é considerado excelente e utilizado amplamente, entretanto, quando o objetivo do estudo é identificar questões emocionais, nutricionais e qualitativas, pode ser utilizado de forma complementar um questionário ou entrevista sobre percepções subjetivas.

Palavras-chave: Critérios diagnósticos. Compulsão Alimentar. Diagnóstico de Compulsão Alimentar.

INTRODUCTION

Eating disorders (ED) are psychopathologies with multifactorial etiology, characterized by dysfunctional eating behaviors, causing imbalances in dietary pattern and attitudes. ED can lead to numerous medical complications, mostly due to late diagnosis. The main characteristic of these diseases is a change in eating behavior, which can progress to extreme thinness or obesity, among other physical and mental injuries [1,2]. The most studied and well-known ED are anorexia and bulimia nervosa [2]. Although binge eating disorder (BED) is not as studied as other eating disorders, it is the most common ED in the general population, with a lifetime prevalence estimated at 3.5% among females and 2% among males [3]. According to the new Diagnostic and Statistical Manual of Mental Disorders (DSM-5) [4], in which BED now has its own category as an eating disorder, BED is characterized by uncontrolled intake of a large amount of food along with a sense of loss of control, which are not followed by inappropriate compensatory behaviors such as self-induced vomiting, fasting, and extreme physical exercise. Because of that, individuals with BED usually are prone to develop overweight or obesity and are at higher risk of metabolic syndrome [5].

Treasure et. al.[1], performed a review about ED and concluded that the diagnosis of such disorders are challenging, mainly because there is an overlap of diagnostic symptoms and associated behaviors across all categories of ED. The inclusion of BED in DSM as a formal diagnosis was supported by a large body of research, and it will be very helpful to reassign many individuals to a diagnosis with greater clinical utility [6].

Take into account the difficulty of diagnosis, many authors, when conducting studies that analyze individuals with suspected BED, use DSM diagnostic criteria or other scales or questionnaires to perform the Identification. However, knowing the disparity and the variety of instruments used in the diagnosis of eating disorders, and taking into consideration that BED suffer the transition from research category to an official recognized disorder, this paper aims to systematically review the methods used to identify binge eating in adult population.

METHOD

This review was conducted according to a predetermined protocol and reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement[7]. A search of the scientific literature was conducted through July 2018 using PUBMED health care computerized database. This search specifically focused on BE diagnosis criteria among adults in studies published in the last 5 years. Search terms included "binge eating", "compulsive eating" and "binge eating diagnosis" and respective entry terms. Inclusion criteria were peer-reviewed clinical trials, databased publications in English with available full text published in the last 5 years.

Titles, abstracts and full texts were reviewed by two independent reviewers. Disagreements regarding study inclusion were settled by a third investigator. Data were extracted independently by two reviewers using a piloted form.

We excluded studies that evaluated children, adolescents and individuals with only bulimia or anorexia nervosa. Many studies included in our review, assessed other variables beyond the binge eating. Thus, emotion, depression and craving scales reported in these studies were not presented in this review. Once the instruments and methods used for achieve the identification of BED in the included papers were retrieved, we conducted a qualitative analysis and a brief review about the major aspects of each one, in order to better understand their utility and validation.

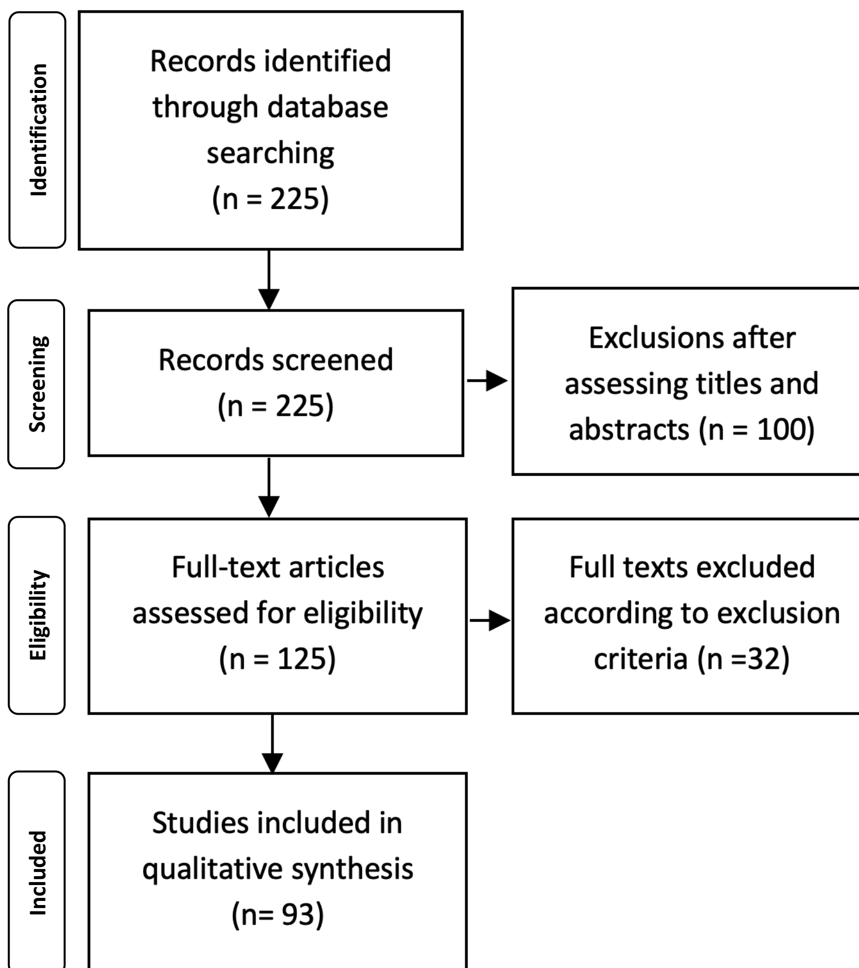
RESULTS

Literature Search and Study Selection

The flow diagram for the selection of eligible studies is presented in Figure. 1. Through database searching, we identified 225 studies. Of these 125 were directly related to the topic of interest, and were, therefore, fully read by independent pairs

for eligibility assessment. On further examination, 32 were excluded based on specific inclusion criteria. A total of 93 studies were included in the final qualitative analysis.

Figure 1 - PRISMA Flow Diagram of literature search and studies selection



Instruments, Diagnostic Criteria and identification methods for BE

It was found a wide variety of instruments for the recognition of BED. These results are summarized in table 1 and table 2. Below, it is briefly presented the main diagnostic methods that were used in the studies included in this review.

Table 1 - Instruments, Diagnostic criteria and identification methods used in the studies included in the review.

Method	Number of studies (%)
DSM IV or V + instrument	61 (65.60)
Only instrument	26 (27.95)
Only DSM IV or V	06 (6.45)

DSM - Diagnostic and Statistical Manual of Mental Disorders

Table 2 - Instruments / scales used for binge eating identification

Diagnostic criteria	N° of studies (%)
DSM [9, 14-15, 17, 19, 23, 26-85]	67 (72.04)
EDE -Q [14-15, 19, 27-29, 33-35, 37- 38, 40, 42-44, 47-50, 55-56, 58-60, 63-68, 70-71, 75-77, 81-83, 90-95]	44 (47.31)
EDE [14, 17, 27- 28, 30-33, 39, 45, 47, 50, 52- 53, 55, 57-58, 62-64, 68-71, 73, 78-80, 82-84, 86-89]	36 (38.70)
BES [8-25]	18 (19.35)
YBOCS-BE [15, 19, 36, 48, 56, 61, 65]	07 (7.52)
TFEQ [15, 17, 19, 51, 65, 98-99]	07 (7.52)
EDI [31, 53, 66, 78-80]	06 (6.45)
YFAS [20, 40, 93, 98]	04 (4.30)
EDDS [72, 96]	02 (2.15)
LOCES [14, 17]	02 (2.15)
QEWP-R [97]	01 (1.07)

BES - Binge Eating Scale; DSM - Diagnostic and Statistical Manual of Mental Disorders; EDDS - Eating Disorder Diagnostic Scale; EDE - Eating Disorder Examination; EDE -Q - Eating Disorder Examination Questionnaire; EDI - Eating Disorder Inventory; EDO-Q - Eating Disorder in Obesity Questionnaire, LOCES - Loss of Control Over Eating Scale; Q-EDD - Questionnaire for Eating Disorder Diagnoses, QEWP-R - Questionnaire on Eating and Weight Patterns – Revised; TFEQ - Three-Factor Eating Questionnaire; YBOCS-BE - Yale-Brown Obsessive Compulsive Scale Modified for Binge Eating; YFAS - Yale Food Addiction Scale.

Binge Eating Scale (BES) [100]

The BES is a 16-item questionnaire used to assess the presence of binge eating behavior indicative of an eating disorder. It was originally developed to assess affective/cognitive aspects and behavioral manifestations of binge eating problems in obese individuals. This instrument has been widely used as a dimensional measure of the severity of binge eating, as a screening tool and as a useful instrument to assess treatment outcomes. The questions are based upon both behavioral characteristics (e.g., amount of food consumed) and the emotional, cognitive response, guilt or shame. Each question has 3-4 separate responses assigned a numerical value. The score range is from 0-46, where:

Non-binging < 17

Moderate binging = 18-26

Severe binging ≥ 27

Diagnostic and Statistical Manual of Mental Disorders [4]

The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) recognizes binge eating disorder (BED) as a distinct disorder, defined by binge episodes, during which an individual consumes an unusual large amount of food and

experiences a sense of lack of control over his eating, but without the inappropriate compensatory behavior required by bulimia nervosa. Originally, BED was introduced in the 4th edition of the DSM as a subcategory of Eating Disorder not Otherwise Specified (EDNOS) but is now a separated diagnostic entity. The DSM-5 diagnostic criterion for BED included significant changes:

According to the DSM-5 criteria, to be diagnosed as having Binge Eating Disorder a person must show:

A. Recurrent episodes of binge eating. An episode of binge eating is characterized by both of the following:
   1. Eating, in a discrete period of time (e.g. within any 2-hour period), an amount of food that is definitely larger than most people would eat during a similar period of time and under similar circumstances.
   2. A sense of lack of control over eating during the episode (e.g. a feeling that one cannot stop eating or control what or how much one is eating).
B. The binge eating episodes are associated with three or more of the following:
   1. eating much more rapidly than normal
   2. eating until feeling uncomfortably full
   3. eating large amounts of food when not feeling physically hungry
   4. eating alone because of feeling embarrassed by how much one is eating
   5. feeling disgusted with oneself, depressed or very guilty afterward
C. Marked distress regarding binge eating is present
D. Binge eating occurs, on average, at least once a week for three months
E. Binge eating not associated with the recurrent use of inappropriate compensatory behaviors as in Bulimia Nervosa and does not occur exclusively during the course of Bulimia Nervosa, or Anorexia Nervosa methods to compensate for overeating, such as self-induced vomiting.

Eating Disorder Examination (EDE) [101]

The EDE is a semi-structured interview that assesses ED symptoms and psychopathology with a focus on the previous 28 days. The EDE assesses the frequency of different forms of overeating, including objective binge-eating episodes (Ex: large quantities of food with a subjective sense of loss of control) and subjective binge-eating episodes (Ex: episodes of loss of control while eating “subjectively” large quantities). The EDE also comprises four subscales (dietary restraint, eating concern, weight concern, and shape concern) the mean of which is

a total global score reflecting ED psychopathology. Items are rated on 7-point forced-choice scales (range 0–6), with higher scores reflecting greater severity/frequency. The EDE is widely viewed as the "gold standard" measure of eating disorder psychopathology. It provides a measure of the range and severity of eating disorder features. It can also generate operational eating disorder diagnoses. It is used in most treatment studies and in many other investigations of eating disorder psychopathology. The current version of the EDE is edition 17.0D. The main difference from the earlier edition (16.0D) is that it is designed to generate DSM-5 eating disorder diagnoses.

Eating Disorder Examination Questionnaire (EDE-Q) [102]

The EDE-Q is a self-reported questionnaire based upon the EDE interview. Its use is indicated when it is impracticable or undesirable to employ the interview. The EDE-Q is very widely used and is also available in many languages. The current version is EDE-Q 6.0. The EDE-Q is a 33-item screener which measures disordered eating over a 28-day period and is scored across 4 sub-scales: Eating Concern, Shape Concern, Weight Concern and Dietary Restraint, as well as a global score, which is an average of the sub-scales.

Eating Disorder Diagnostic Scale (EDDS) [103]

The EDDS is a brief self-report scale, contains 22 items that diagnose eating disorders, such as anorexia nervosa, bulimia nervosa, and binge eating disorder. The EDDS was developed by adapting items from structured clinical interviews (EDE and SCID) and cross-referencing the diagnostic criteria from the current DSM at the time (DSM-IV).

Eating Disorder Inventory (EDI) [104]

The EDI is a self-reported questionnaire widely used both in research and in clinical settings to assess the symptoms and psychological features of eating disorders. The latest revision to the Eating disorder inventory; Eating disorder inventory-three (EDI-3) was released in 2004. It contains 91 items divided into twelve subscales rated on a 0-4 point scoring system. Of this, three items are specific to eating disorders and nine are general psychological scales that, although not specific, are relevant to eating disorders. It yields six composites: Eating Disorder Risk, Ineffectiveness, Interpersonal Problems, Affective Problems, Overcontrol, General

Psychological Maladjustment. It is also a self-report questionnaire administered in twenty minutes.

Loss of Control Over Eating Scale (LOCES) [105]

The LOCES is a multidimensional scale designed to assess Loss of control eating in both clinical and nonclinical populations. Three factors of the LOCES emerged: (1) the behavioral aspects, (2) the cognitive/dissociative aspects, and (3) the positive/euphoric aspects. The two versions of LOCES are: with 24 items (original) and a short version with 7 items, as follows: 1 = never to 5 = very often, according to the description of the experience with eating in the last Eating Disorder Diagnosis 4 weeks.

Three-Factor Eating Questionnaire (TFEQ) [106]

The TFEQ is a self-assessment questionnaire designed to measure cognitive and behavioral components of eating in obese populations. It contains 51 items, aggregated into three scales: "Cognitive Restraint", "Disinhibition" and "Hunger". Each item scores either 0 or 1 point. The minimum score for factors I-II-III is therefore 0-0-0, the possible maximum score 21-16-14. There are reduced versions and also validated - TFEQ-18 and TFEQ-21.

Yale-Brown obsessive compulsive scale modified for binge eating (YBOCS-BE) [19]

The Yale-Brown Obsessive Compulsive Scale modified binge eating for measured obsessiveness of BE thoughts and compulsiveness of BE behaviors. Y-BOCS-BE total score ranges from 0 to 40, with higher scores indicating more severe symptoms.

Yale Food Addiction Scale (YFAS) [107]

The Yale Food Addiction Scale (YFAS) assesses addiction-like eating of palatable foods based on the seven diagnostic criteria for substance dependence in DSM-IV. The YFAS consists of 27 questions, 16 that assess the frequency of behaviors such as overeating and the experience of withdrawal symptoms, 8 yes/no questions that assess the impact of eating behaviors and success of trying to cut down on certain foods, and 3 questions that assess which foods the respondent finds problematic. The YFAS has been reported to have adequate internal reliability and convergent, discriminant, and incremental validity among undergraduates.

DISCUSSION

This systematic review enabled us to describe the instruments and diagnostic criteria for Binge Eating Assessment for Adults used in CTs. The criteria or factors used to diagnose BE in the DSM are objective, and its severity and characterization are focused on the quantification of the binge eating episodes. Although in some items appear the feeling of "guilt" or "shame" the DSM does not assess specific issues about the intensity of these feelings, thoughts and sufferings. The scales (questionnaires) have several advantages in their use: many are easy, quick to administer, do not involve training, are efficient, economical, and capable of revealing behavior that, being considered shameful, could be omitted in an interview. They have disadvantages such as: not accurately evaluating some more complex concepts, which are better investigated by clinical interviews.

The Eating Disorder Examination (EDE) [101], is a semi-structured clinical interview considered the gold standard in diagnosis of eating disorders, and also evaluates the severity of psychopathology with good levels of validity and reliability. However, EDE is a long questionnaire, taking an average of 60 minutes to complete. Thus, a faster version of EDE was adapted (15 minutes) and self-administered: the EDE-Q [102]. This questionnaire has 36 items and provide a satisfactorily way to assess eating disorders also based on the four subscales. The Binge Eating (BES) [100] is self-administered questionnaire adequate to assess the interrelationships between binge eating, psychopathological symptoms and weight changes. BES is used to identify obese patients with binge eating and contributes to in planning of effective therapeutic strategies expanding knowledge of psychopathological symptoms.

This systematic review has some limitations. We restricted our search for studies published in English and we didn't perform a search in grey literature, thus the contribution of non-English reports and unpublished studies to our findings is unknown. Although we have not registered our protocol, the complete search strategy is available at Supplemental Content to enable the replication of the search.

The DSM-5 diagnostic criteria for BED it is considered an excellent diagnostic criteria, however, in our perception, if the objective is to identify emotional and qualitative issues, it could be included with the DMS-5 a questionnaire or interview about subjective perceptions.

The questionnaires and interviews also assessed the feelings and behaviors involved in the individual's daily life, before, during and after episodes of binge eating, or

even when the episode did not happen, but the thoughts were focused on this. When used in isolation questionnaires may even contain points of the DSM, however, for a full evaluation and diagnosis for to identify behavior and nutritional issues, the ideal would be to use a tool to assess the feelings and behavior as a whole, and also quantify the episodes. The most used instrument in the studies is the EDE interview and the EDE questionnaire; however, our perception is that, when used in association with DSM, any questionnaire presented in this review would be more complete as diagnostic method. We conclude that the best way to diagnose binge eating - qualitative and quantitative - is to use DSM with an instrument (any tool reported in this review).

CONCLUSION

The DSM-5 diagnostic criterion for binge eating disorder is considered excellent and widely used, however, when the objective of the study is to identify emotional, nutritional and qualitative issues, a questionnaire or interview about subjective perceptions can be used in a complementary way.

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