ISSN: 2318-8413 DOI: 10.18554/refacs.v9i4.5606 REFACS

Repercussions of mindful eating and intuitive eating approaches on the health of adult individuals: an integrative review

Repercussões das abordagens *mindful eating* e *intuitive eating* na saúde de indivíduos adultos: revisão integrativa

Repercusiones de los enfoques de *mindful eating* e *intuitive eating* en la salud de individuos adultos: revisión integradora

Received: 07/10/2020
Approved: 11/05/2021
Published: 14/10/2021

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This is an integrative review carried out in the first half of 2020, from October 2008 to December 2019 in the PubMed, LILACS, SciELO, PsycINFO and Scopus databases. It aimed to know the research production and repercussions of the approaches centered on "mindful eating" and "intuitive eating" in the health of adult individuals. The guiding question was: *What are the repercussions of approaches centered on "mindful eating" and "intuitive eating" on the health of adult individuals?* For the searches, descriptors were used: mindful eating, intuitive eating and "*atenção plena*" (mindfulness). The corpus consisted of 20 articles in full, all international, with three categories: *Results of approaches centered on mindful eating in mental health*; *Results of approaches centered on mindful eating in physical health*; and *Results of intuitive eating-centered approaches to mental and physical health*. Interventions based on mindful eating and/or intuitive eating had a positive impact on physical and mental health, improving eating behavior, food choices, reducing levels of emotional eating and stress, helping with weight loss, reducing body mass index and in the treatment of eating disorders, thus, promising strategies to improve the health of adult individuals.
Descriptors: Mental Health; Human Rights; Community Mental Health Services; Humanization of Assistance.

Esta é uma revisão integrativa realizada no primeiro semestre de 2020, considerando o período de outubro de 2008 a dezembro de 2019 nas bases de dados PubMed, LILACS, SciELO, PsycINFO e Scopus, com o objetivo de conhecer a produção de pesquisas e as repercussões das abordagens centradas no "*mindful eating"* e no "*intuitive eating"* na saúde de indivíduos adultos. A questão norteadora foi: *Quais as repercussões das abordagens centradas no "mindful eating" e no "intuitive eating" na saúde de indivíduos adultos?* Para as buscas, foram utilizados descritores: *mindful eating*, *intuitive eating* e atenção plena. O *corpus* foi composto por 20 artigos na íntegra, todos internacionais, com três categorias: *Resultados das abordagens centradas no mindful eating na saúde mental*; *Resultados das abordagens centradas no mindful eating na saúde física*; e *Resultados das abordagens centradas no intuitive eating na saúde mental e física.* As intervenções baseadas em *mindful eating* e/ou *intuitive eating* repercutiram positivamente na saúde física e mental, melhorando o comportamento alimentar, as escolhas alimentares, reduzindo os níveis de alimentação emocional e estresse, auxiliando na perda de peso, na redução do índice de massa corporal e no tratamento de transtornos alimentares, sendo assim, estratégias promissoras para melhorar a saúde de indivíduos adultos.
Descritores: Saúde Mental; Direitos humanos; Serviços comunitários de saúde mental; Humanização da assistência.

Esta es una revisión integradora realizada en el primer semestre de 2020, considerando el periodo comprendido entre octubre de 2008 y diciembre de 2019 en las bases de datos PubMed, LILACS, SciELO, PsycINFO y Scopus, con el objetivo de conocer la producción de investigaciones y las repercusiones de los enfoques de "*mindful eating*" e "*intuitive eating*" en la salud de individuos adultos. La pregunta guía fue: *¿Cuáles son las repercusiones de los enfoques de "mindful eating" e "intuitive eating" en la salud de los adultos?* Para las búsquedas se utilizaron descriptores: *mindful eating, intuitive eating* y *atenção plena* (atención plena). El *corpus* se compuso de 20 artículos completos, todos internacionales, con tres categorías: *Resultados de los enfoques de mindful eating en la salud mental; Resultados de los enfoques de mindful eating en la salud física;* y *Resultados de los enfoques de intuitive eating en la salud mental y física.* Las intervenciones basadas en *mindful eating* y/o *intuitive eating* han tenido repercusiones positivas en la salud física y mental, mejorando el comportamiento alimentario, la elección de alimentos, reduciendo los niveles de alimentación emocional y de estrés, ayudando a la pérdida de peso, reduciendo el índice de masa corporal y tratando los trastornos alimentarios, siendo por tanto estrategias prometedoras para mejorar la salud de individuos adultos.
Descriptores: Salud Mental; Derechos Humanos; Servicios Comunitarios de Salud Mental; Humanización de la Atención.

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INTRODUCTION

Currently, it is known that many diseases presented by the population are linked to lifestyle habits, especially eating habits[1]. However, traditional nutritional intervention programs to help treat these diseases are not effective[2]. Such failure may be associated with the fact that conventional treatments are based almost exclusively on the prescription of diets. Such an approach is centered on food restriction and on the biological perspective of eating, not covering the multidimensionality of eating and health-related behaviors[3].

From this perspective, two approaches have been gaining prominence in the food and nutrition scenario: mindful eating and intuitive eating. Mindful Eating (ME) consists of the ability to bring loving attention to the entire eating process, in which individuals are aware of the food's taste, texture, without judgment. The proposal is that there is full attention to sensations, feelings and thoughts related to the presence or absence of hunger, both physical and emotional[4].

Thus, ME is an experience that involves body, mind and heart in the choice and preparation of food, as well as in the act of eating it[4,5]. Currently, there are different programs for the management of eating behavior through ME programs in different clinical settings. These programs are called Mindfulness Based Interventions (MBI), in which the ME is applied through these MBI's. Among these, there are two internationally recognized protocols that present evidence: (1) Mindfulness Based Eating Awareness Training (MBEAT)[6] and (2) Mindfulness Based Eating Solution (MBES-Eat for life)[7].

In the same vein, Intuitive Eating (IE) is an approach that aims to integrate mind, body and food, in which the subject must eat guided mainly by its physiological signaling of hunger and satiety. For this, it is extremely important that there is a connection with the body's internal signals. The main components of the intuitive eating style are: unconditional permission to eat; eating for physical and non-emotional reasons, and having confidence in your body and its hunger and satiety signals to determine when and how much to eat[8,9].

Interest in these relatively new approaches has increased, but the systematization of knowledge about them for the health of adult individuals is few. One can mention: verifying the effects of mindful eating on weight loss[10] and on behaviors related to obesity and eating disorders[5]. Other studies have addressed other aspects that not only the outcomes of ME and IE interventions on food intake and health[11], eating behavior[12,13] and weight[14], but also the effects of non-diet and/or mindfulness-based interventions, acceptance and commitment and behavioral dialectics.

There are few studies that only presented results of interventions based on mindful eating and/or intuitive eating in health (especially Brazilian ones[5]), as a multidimensional concept that involves physical, mental and social well-being proposed by the World Health Organization (WHO)[15] and in which this review is supported by adult individuals.

The systematization of this knowledge is important not only for a better understanding, but also to spread, in Brazil, the knowledge of international research involving these approaches (mindful eating and intuitive eating), contributing to the reduction of this knowledge gap. Thus, this study aimed to know the production of research and the repercussions of approaches centered on “mindful eating” and “intuitive eating” on the health of adult individuals.

METHODS

It is an integrative review, which seeks to synthesize the state of knowledge about a given subject, discussing it in an integrated manner, with the possibility of surveying gaps that require further research. The initial purpose of this method is to obtain a deep understanding of a given phenomenon based on previous studies[16].

The integrative review includes the analysis of research that is relevant and that will serve

as a basis for decision making and for improving clinical practice. The procedure performed in this review followed the following steps: (1) identification of the theme and guiding question; (2) establishment of inclusion/exclusion criteria; (3) categorization of studies; (4) evaluation of studies; (5) interpretation of results and (6) synthesis of knowledge. The international protocol for systematic review studies and meta-analyses, the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses), was also adopted to guide both the inclusion and exclusion of articles and the writing of this review[16].

For this study, the research question was defined based on the PICO strategy, which provides for the definition of the participant (P), intervention (I), comparison (C) and outcomes (O), with the exception of the comparison item, which was excluded from the wording of the question, a change that is foreseen in the PICO methodology in some cases[17]. It is intended to answer the guiding question: What are the repercussions of the approaches centered on "mindful eating" and "intuitive eating" (I) on the health (O) of adult individuals (P)?

The selection of articles took place in January 2020, and was carried out by two independent judges. If there was disagreement among reviewers as to the adequacy of the study, an evaluation by a third judge took place. Searches were performed in the PubMed, *Literatura Latino-americana e do Caribe em Ciências da Saúde* (LILACS), Scientific Electronic Library Online (SciELO), PsycINFO and Scopus databases. Studies in Portuguese, English and Spanish were considered. These databases were chosen for their extend, nationally and internationally, published on the topic of interest, and also for including reputable journals in the health area.

As there are no indexed descriptors according to the standardization of DeCs/MeSh, for the searches, non-indexed descriptors were used, but that are directly related to the theme, namely: mindful eating, intuitive eating and *atenção plena* (mindfulness). These keywords appeared in at least one of the following search fields: title, abstract, subject or keyword.

The established inclusion criteria were (a) articles published between October 2008 and December 2019; (b) that directly address the topic of interest; (c) empirical; (d) with adults; (e) that were freely available for full reading; (f) that sought to assess the repercussions of approaches centered on ME or IE on some health outcome; and (g) published in Portuguese, English and/or Spanish.

The following were excluded: (a) studies with children, adolescents and the elderly; (b) materials such as monographs, editorials, books, book chapters, reviews and abstracts in conference proceedings; (c) association studies; (d) review articles; and (e) studies on the development and validation of protocols or questionnaires. Studies that were repeated in more than one database were computed only once.

To check whether the articles met the inclusion and exclusion criteria, an evaluation was carried out by two independent reviewers, in the following order: (1) titles of all identified studies; (2) abstracts of the studies selected in the previous phase and (3) complete reading of the selected texts.

After excluding the articles that did not meet the inclusion criteria, all articles that made up the corpus of analysis of this study were registered, with the following information: title, authors, year and place of publication, database in which the study was found, design, sample, instruments used, objectives, main results and main conclusions.

In possession of the articles, categories were built with productions that had similarities to each other. The World Health Organization (WHO)[15] concept of health was used to support this categorization. Within the scope of "physical well-being", issues related to their own biological health or any behavior that directly affected it were considered. Therefore, the effects on physical well-being in relation to weight, body mass index (BMI), weight maintenance, improvements in fasting blood glucose, postprandial blood glucose, glycated hemoglobin and C-reactive protein levels were considered.

For "mental well-being", some repercussion involving psychological health was

considered, such as food choices, eating behavior, emotional eating, consumption of sweets in diabetic patients, in the treatment of eating disorders, psychological distress and body appreciation.

RESULTS

The combination of descriptors used in the search strategies in each database is described in Table 1. The searches in the databases resulted in a total of 850 articles. The database with the highest number of articles was PubMed (393), followed by PsycINFO (239), SCOPUS (200), LILACS (12) and SciELO (6).

Table 1. References found in the databases according to the search strategy used. Ribeirão Preto, 2020.

Search strategy	Database	Number of articles found
((Mindful* **OR** intuitive) **AND** eating)	PsycINFO	239
((Mindful* **OR** intuitive) **AND** eating)	PubMed	393
((Mindful* **OR** intuitive) **AND** eating)	SCOPUS	200
((Mindful* **OR** intuitive) **AND** eating)	LILACS	12
((Mindful* **OR** intuitive) **AND** eating)	SciELO	6
Total		**850**

In the first stage of the analysis, 79 articles were excluded for being duplicates and 50 articles were literature reviews. Subsequently, 628 articles were excluded, mainly because they did not directly address the topic of interest. There were 93 articles left for full reading and, after this reading, 73 articles were also excluded for not meeting the inclusion criteria, thus making a total of 20 articles that made up the corpus of this review. Figure 1 presents the study selection strategy flowchart according to PRISMA standards.

Figure 1.Selection steps of articles included in the integrative review. Ribeirão Preto, 2020.

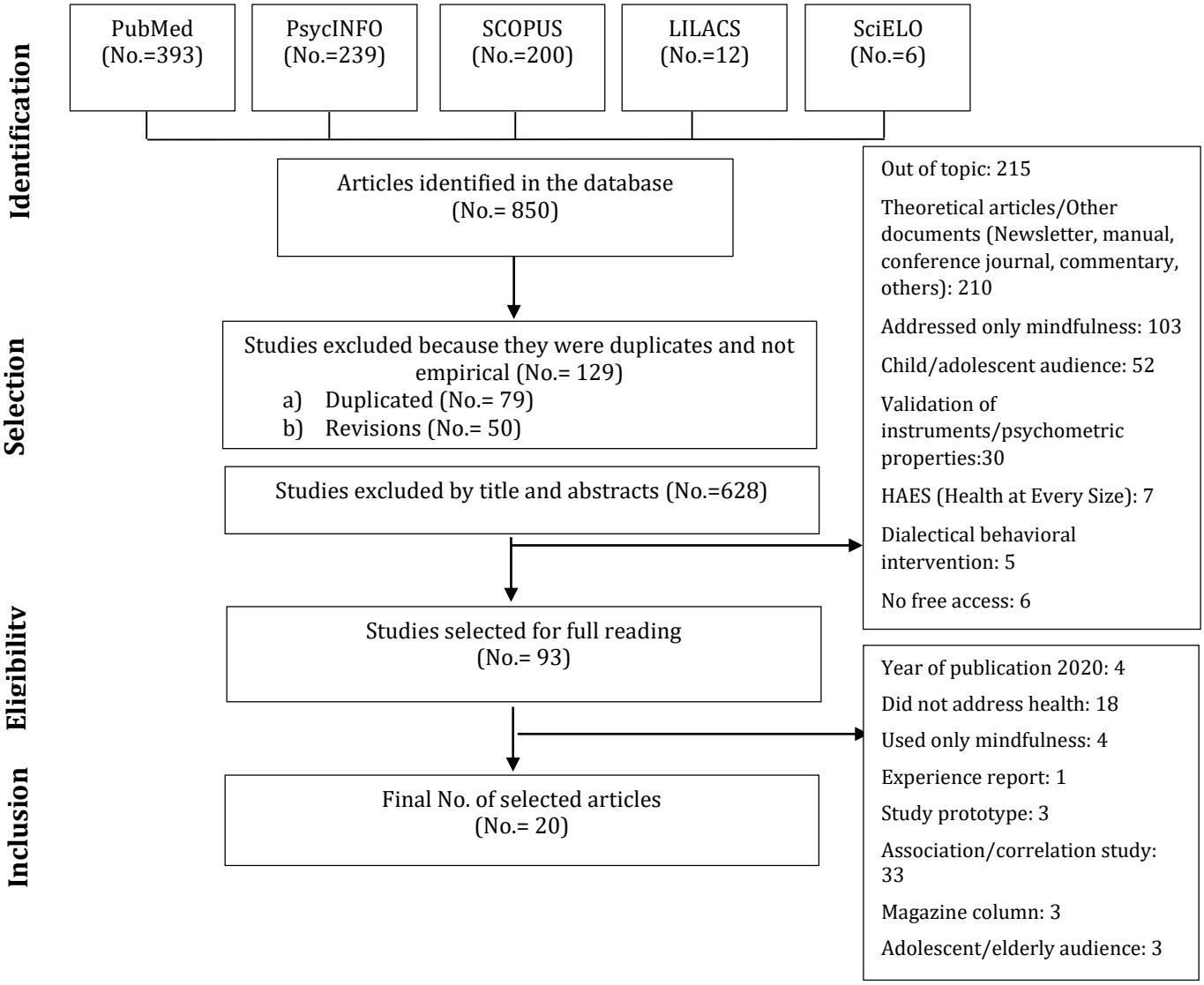

Table 2 shows information related to authors, year of publication, sample, design, main objective and main results found in the selected articles.

The articles that make up this review are exclusively international and written in English. The country with the highest number of publications was the United States (No. = 14; 70.0%), followed by Australia (No. = 03; 15.0 %), Canada (No. = 01; 5.0%), Spain (No. = 01; 5.0%) and Thailand (No. = 01; 5.0%). The year with the highest number of publications was 2010 (No. = 04; 20.0%), followed by 2019, 2017, 2014 and 2012 with 3 articles (15.0%) each. The years 2018, 2016, 2015, and 2013 were the ones with the lowest number of publications, with only 01 article (5.0%) each.

The sample size of the studies ranged from 01 (smallest sample number)[34] to 194 (largest sample number)[25] of participants. Most of the studies were developed with men and women (No. = 10; 50.0%), however an important portion of the studies were carried out exclusively with women (No. = 09; 45.0%) and only 01 (5.0) %) was performed exclusively with men.

Most of the studies were carried out with overweight and obese subjects (No. = 06; 30.0%), followed by individuals with eating disorders (No. = 03; 15.0%) and individuals with diabetes (No. = 02; 10, 0%). One (5.0%) study with pregnant women with gestational diabetes mellitus and 01 (5.0%) study with subjects with severe mental illness.

Regarding the type of study, most articles fit into the randomized type (No. = 10; 50.0%), followed by the evaluation of participants before and after the intervention (No. = 07; 35.0%). The longest intervention lasted 5.5 months[24], and the shortest lasted a single session[23]. The intervention time most commonly found in the studies was 8 weeks (No. = 03, 15.0%) and 6 weeks (No. = 03, 15.0%). Most studies used the intervention based on mindful eating (No. = 16; 80.0%), followed by interventions that used intuitive eating (No. = 04; 20.0%).

It is also important to mention that research with a control group (No. = 12; 60.0%) had an active control group in 06 studies (30%), that is, participants received some type of intervention that did not involve mindful eating and intuitive eating and 06 studies (30.0%) did not perform any type of intervention in the control group.

Regarding the use of standardized protocols, it was observed that 65.0% of the studies (No. =13) used groups with interventions based on internationally recognized protocols. Of those who did not use it, there were strategies such as the use of applications or online resources for some mindful eating or intuitive eating sessions (No. = 04; 20%). In 10.0% (No. = 02) of the studies, a combination was made with mindfulness methods and the other was carried out in an individualized session (No. = 01; 5.0%). Among the studies analyzed, the conduct of interventions through a trained and qualified professional in ME or IE was cited in 55.0% (No. = 11) of the articles.

Table 2. Studies involving interventions based on mindful eating or intuitive eating. Ribeirão Preto, 2020.

Author and place	Sample	Main objective and design	Main results
Lyzwinski et al. (2019)[18] Australia	90 university students (45 allocated in the ME intervention group and 45 in the control group).	Test the effectiveness, acceptability and feasibility of an application that combined mindfulness and ME-based stress reduction techniques on weight, eating behavior and stress levels. Duration of intervention: 11 weeks. Randomized controlled study.	At the end of the intervention, there were no differences in weight between the experimental vs. control. The ME intervention group had lower levels of stress, emotional eating and uncontrolled eating, in addition to higher levels of mindfulness and ME vs. group control.
Gidugu e Jacobs (2019)[19] United States	46 individuals with severe mental illness.	To evaluate the effect of a program based on ME and food education on health behavior in relation to eating in individuals with severe mental illness. Duration of intervention: 14 weeks. Experimental design of longitudinal section. Study with evaluation of the type before and after the intervention.	After the intervention, participants decreased emotional eating and overeating scores, and increased conscious eating scores.
Dibb-Smith et al. (2019)[20] Australia	158 individuals	To investigate the effects of an ME exercise sent by email (adapted from the "raisin meditation"), to be performed with foods chosen by the participants, on unwanted habits of "snacking" (frequent consumption of food between meals), ME and self-compassion levels. Duration of intervention: 2 weeks. Experimental design of longitudinal section. Study with evaluation of the type before and after the intervention.	There was an increase in the scores related to the unwanted habit of "snacking" and a reduction in the levels of self-pity after the intervention, with no change for the ME levels.
Webber et al. (2018)[21] United States	26 individuals (14 allocated in the IE intervention group and 12 in the EBT control group - stress reduction program)	Compare the effects of the two approaches (IE and EBT - stress reduction program) on weight, eating behavior and levels of stress and depression. Duration of intervention: 14 weeks Randomized controlled study.	There was no difference in weight loss, eating behavior and emotional parameters between groups; as well as intra-groups at the end of the interventions.
Wnuk et al. (2017)[22] Canada	22 adult women	To evaluate the effects of an MB-EAT-based intervention on weight maintenance and psychological symptoms after bariatric surgery. Duration of intervention: 16 weeks Experimental design of longitudinal section. Study with evaluation of the type before and after the intervention.	After the intervention, there was a significant reduction in levels of depression, emotional eating and binge eating; and weight maintenance among participants.
Allirot et al. (2017)[23] Spain	70 adult women (35 allocated to the ME intervention group and 35 to the control group).	Evaluate the effect of an ME-centered approach on food choices, food intake, taste and external food behaviors (eating in response to external signals: smell or appearance of food, independent of internal signs of hunger and satiety) and emotional behavior in adult women. Duration of intervention: Single session. Cross-sectional experimental design, with evaluation after intervention.	The ME approach improved participants' food choices and food intake, significantly reducing eating behaviors for external reasons and consumption of foods with high calorie density vs. group control. There was no effect on the taste of individuals.

Mason et al. (2017)[24] United States	104 overweight or obese women.	Evaluate the impact of an ME-based intervention, made via smartphone, on binge eating, food craving, emotional eating and physical hunger. Duration of intervention: 12 weeks. Experimental design of longitudinal section. Study with type assessment before and after the intervention.	The ME-based intervention generated significant reductions in binge eating, emotional eating and physical hunger scores. There was also a reduction in the weight of the participants.
Mason et al. (2016)[25] United States	194 individuals with obesity (100 from the mindfulness and ME-based intervention group and 94 from the control group, who received general information about nutrition and physical activity).	To evaluate the effects of an intervention based on mindfulness and ME on sweets consumption and fasting blood glucose levels. Duration of intervention: 5.5 months. Randomized controlled study	The intervention based on mindfulness and ME generated a significant reduction in sweets consumption and fasting glucose when compared to the control group.
Stites et al. (2015)[26] United States	26 overweight or obese adults (10 allocated in the 8-week ME intervention group and 16 in the 4-week "short intervention" group).	To evaluate the effect of an ME-based intervention in promoting healthier lunch purchases (lower kcal and fat content). Duration of intervention: 8 weeks intervention group versus 4 weeks in the "short intervention" group. Randomized controlled study.	Participants in the ME intervention group bought lunches with lower calorie and fat content compared to the "short intervention" group.
Youngwanichea et al. (2014)[27] Thailand	170 pregnant women with gestational diabetes mellitus (GDM) (85 allocated to the ME intervention group and 85 to the control group, without any intervention).	To investigate the effect of an intervention based on EM and yoga practice on the glycemic levels of pregnant women with GDM. Duration of intervention: 8 weeks Longitudinal randomized controlled trial.	The group with intervention based on EM showed a significant reduction in fasting glucose, postprandial glucose (2 hours) and glycated hemoglobin, when compared to the control group.
Bush et al. (2014)[28] United States	124 women (53 allocated in the intervention group and 71 in the control group - waiting list).	To examine the effectiveness of an intervention based on IE and ME (Eat for Life Protocol) on eating behavior, body appreciation, levels of IE and mindfulness. Duration of intervention: 10 weeks. Experimental design of longitudinal section	The intervention group had higher scores for body appreciation, IE and mindfulness levels; and greater chances of being asymptomatic for eating disorders vs. group control.
Miller et al. (2014)[29] United States	52 individuals (27 allocated in the Mindfulness-Based Food Awareness Training group adapted for diabetes (MBEAT-D); and 25 in the Smart Choices group - SC).	To assess the impact of an education-based intervention for diabetes self-management (SC) versus MBEAT-D protocol-based intervention on food intake, food-related self-efficacy, diabetes self-management, levels of mindfulness, and depressive symptoms. Duration of intervention: 3 months. Prospective randomized controlled study	The SC group had greater increase in knowledge and effective beliefs in diabetes self-management vs. MBEAT-D, after intervention. For the consumption of fruits and vegetables, levels of mindfulness, depressive symptoms and knowledge and self-efficacy related to nutrition and food, there was no difference between the groups.

Kidd et al. (2013)[30] United States	12 obese women	Describe the effects of an EM-based intervention on levels of conscious eating and depression; in weight, body fat and blood pressure; and in self-efficacy for weight loss. Duration of intervention: 8 weeks. Experimental design. Study with evaluation of the type before and after the intervention.	The ME intervention increased self-efficacy for weight loss. There were no significant changes to conscious eating and depression levels; and for weight, body fat and blood pressure after the intervention.
Anglin (2012)[31] United States	16 individuals with obesity (8 allocated in the IE intervention group and 8 in the control group with caloric restriction intervention).	Evaluate the effects of an IE-centric approach vs. caloric restriction (CR) approach based on weight loss, BMI and waist circumference (WC) values. Duration of intervention: 6 weeks. Randomized controlled study.	Weight loss and reduction in BMI values were significantly greater in CR vs. IE after the intervention. For WC there were no differences between groups.
Timmerman e Brown (2012)[32] United States	35 women (19 allocated in the intervention group with ME and 16 in the control group, without any intervention).	To evaluate the effect of the ME approach on weight control in women who ate in a restaurant at least 3 times a week. Duration of intervention: 6 weeks. Randomized controlled study.	Participants in the ME group lost more weight, reduced caloric intake and reduced fat intake when compared to the control group.
Miller et al. (2012)[33] United States	52 individuals (27 allocated in the Mindfulness-Based Food Awareness Training group adapted for diabetes (MBEAT-D); and 25 in the Smart Choices group - SC).	To assess the impact of an education-based intervention for diabetes self-management (SC) versus an intervention based on the MBEAT-D protocol on weight loss, BMI, waist circumference (WC), glycated hemoglobin levels, food intake, and fasting insulin. Duration of intervention: 3 months. Prospective randomized controlled trial.	Both groups showed decreased weight, BMI, WC, glycated hemoglobin levels and energy intake at the end of the interventions, with no difference between them. Between the groups, there was a difference in the consumption of trans fats (lower consumption in the SC group), total fiber (higher consumption in the SC group) and total sugars (lower consumption in the MBEAT-D group) at the end of the intervention.
Albers (2010)[34] United States	1 student	Describe the use of the ME-based approach in the treatment of anorexia nervosa. Duration of intervention: 15 sessions (which took place during one semester). Observational design case study.	After the ME-based approach, there was a reduction in food restriction and an increase in BMI and caloric intake. There was also an improvement in relation to emotional distress.
Cole e Horacek (2010)[35] United States	32 women from a military installation (18 allocated in the IE intervention group and 14 in the control group, with no intervention)	Evaluate the effectiveness of an IE-based program in improving diet mindset. Duration of intervention: 10 weeks. Experimental design of longitudinal section.	The program improved participants' diet mentality, who initiated more intuitive lifestyle behaviors, reduced emotional eating and increased their self-esteem vs. group control.
Hepworth (2010)[36] Australia	33 women with eating disorders.	To investigate the benefits of an ME-based group in the treatment of eating disorders. Duration of intervention: 10 weeks Longitudinal exploratory design.	There was a significant improvement in the EAT-26 scores (used to assess symptoms and behaviors characteristic of eating disorders) after participation in the ME-based group.

		Study with evaluation of the type before and after the intervention.	
Dalen et al. (2010)[37] **United States**	10 individuals with obesity.	Verify the impact of an ME-based program (MEAL) on weight, BMI, eating behavior, mental health and physiological markers (cardiovascular risk such as glucose, LDL, adiponectin). Duration of intervention: 6 weeks. Experimental design of longitudinal section. Study with evaluation of the type before and after the intervention.	After the program, there was a significant reduction in weight and C-reactive protein levels, improvement in binge eating and psychological distress scores.

The results were organized into 3 categories: *Results of approaches centered on mindful eating in mental health* (13 articles); *Results of approaches centered on mindful eating in physical health* (10 articles); and *Results of intuitive eating-centered approaches to mental and physical health*. (04 articles). Some productions were in more than one category.

Results of approaches centered on mindful eating in mental health

13 articles were placed in this category, with researches evaluating the repercussions of intervention based on mindful eating that involved the mental health of the participants, which sought to assess the impacts: (1) on food choices, eating behavior and emotional eating; (2) in the consumption of sweets in diabetic patients; (3) in the treatment of eating disorders and (4) in psychological distress.

The studies that had among their objectives to evaluate improvements in eating behavior and improvements in food choices (No. = 06; 30%) brought satisfactory results, as improvements were observed in binge eating scores, reductions in emotional eating levels, improvements in food choices and food intake, decreased food for external reasons, decreased consumption of high calorie and high-fat foods, energy intake, and there was an increase in conscious eating scores.

Regarding the studies involving individuals with diabetes (No. = 02; 10%), after the intervention a significant reduction in the consumption of sweets was observed. For studies carried out with patients with ED (No. = 02; 10%) there was a decrease in dietary restriction, improvement in emotional distress and improvement in the EAT-26 scores (used to assess symptoms and behaviors characteristic of ED).

In studies that evaluated some emotional characteristics of the participants (No. = 03; 15%), a reduction in levels of stress and depression was observed, and an improvement in emotional suffering after participating in the interventions.

Results of approaches centered on mindful eating in physical health

Ten articles were placed in this category, where research involving the intervention based on mindful eating that involved the physical health of the participants sought to assess the impacts: (1) on weight, BMI and weight maintenance; (2) improvements in fasting blood glucose, postprandial blood glucose, and glycated hemoglobin, and (3) C-reactive protein levels.

The studies that aimed to evaluate improvements in relation to weight, BMI and weight maintenance (No. = 05; 25%) also showed promising results, since it was observed that in 10.0% (No. = 02) there was maintenance of the weight, and in the others there was an increase in efficacy for weight loss, weight reduction, BMI and waist circumference. In the study developed with the clinical condition of anorexia nervosa 01 (5.0%) there was an increase in BMI.

In studies that evaluated blood glucose and glycated hemoglobin (No. = 02; 10%) also presented satisfactory results, since the intervention promoted a significant decrease in fasting glucose, postprandial glucose and glycated hemoglobin. The only study that looked at C-reactive protein levels also found a reduction in their levels after intervention.

Results of intuitive eating-centered approaches to mental and physical health

The four studies placed in this category involved intervention based on intuitive eating related to the mental health of the participants, and sought to assess the impacts: (1) on eating behavior, emotional eating; (2) in emotional aspects and (3) body appreciation.

Although 1 study (5%)[19] did not find significant changes in eating behavior and emotional parameters with the intervention, the other 2 (10%)[27,34] found positive results after the intervention, including: significant reduction in emotional eating and physical hunger, increased scores for body appreciation and improvement in the participants' diet mentality, who initiated more intuitive life behaviors and increased self-esteem.

Only 01 (5%) study evaluated the impact of intervention based on intuitive eating on participants' physical health. The study by Anglin[31] sought to assess the effects of an approach

centered on IE vs. caloric restriction (CR) approach was based on weight loss, BMI and waist circumference (WC) values and concluded that weight loss and BMI reduction were greater for the CR group than for the IE group. Regarding WC, there was no significant difference.

DISCUSSION

The 20 studies that investigated the repercussions of approaches centered on "mindful eating" and "intuitive eating" on the health of adult individuals showed that such interventions had a positive impact on both the physical and mental health of the subjects[18-37].

Eating behavior is shaped by an intense interaction between a diverse range of factors, such as physiological, social, genetic, psychological and cultural factors, making it complex, since eating is a social act that goes beyond basic food needs indispensable for human survival. After eating, the subject seeks to meet not only their physiological needs, but also their hedonic (pleasant) and emotional needs[38].

In this light, interventions centered on mindful eating and intuitive eating are highlighted for bringing together and valuing emotional and psychosocial aspects that permeate food, in addition to physiological ones. Both interventions are not focused on changing the foods that the individual consumes, but on understanding the relationship that individuals have with food, and on how the mind and body understand the experience of eating, different from traditional approaches that are characteristically prescriptive and restrictive, not taking into account the psychosocial aspects of eating[39].

Although behavior and eating practices are influenced by numerous factors, the emotional factor is highlighted and is pointed out as the main determinant of excessive eating. Adherence to dietary control tends to be hampered by emotions, as the rational function can be inhibited when the emotional one stands out[40].

In this sense, the promising results obtained with mindful eating and intuitive eating are closely related to the look that both approaches bring to emotional eating, helping the individual both to identify the differences between physical hunger versus emotional hunger, as well as to develop skills to deal with difficult emotions and sensations, avoiding the search for food as a form of emotional self-regulation[12].

From these interventions, subjects have the possibility to develop and train the ability to observe their own experience, without judgment or criticism, which can avoid dysfunctional eating behaviors, and also equip themselves to deal with and accept negative feelings, without, necessarily, suppress them through food[41].

Understanding the psychosocial aspects that permeate food and participate in the regulation of eating behavior should be an essential part of approaches that are intended to help individuals improve their relationship with food. From this perspective, interventions based on ME and IE are highlighted for prioritizing the improvement of this relationship, with interventions that help the individual to observe their own experience with eating, without judgment or criticism, and begin to learn to manage and accept negative feelings with more acceptance, kindness and compassion, minimizing the impulse to deal with these feelings through food[41].

A study investigated the benefits of a group based on EM in the treatment of eating disorders, and had a positive result, as after the intervention a significant improvement in the EAT-26[36] scores was observed. This result was in line with a national review, in which the ME approach had positive results[5].

There are positive mental impacts that can result from programs that incorporate and value the ME principles. These impacts on mental health can be justified by the fact that interventions based on BD protocols help individuals to deal with psychological factors that affect eating patterns, as this intervention helps them to have greater perceptions of their thoughts, emotions and distressing sensations and by consequently, they stop eating in

response to emotional signals and start eating in response to physical signals (hunger and satiety)[19].

The practice of self-care that both interventions provide can be important for promoting body appreciation. High levels of body appreciation have been associated with a lower frequency of negative body conversations among women, thus promoting a positive body image. The concept of positive body image reflects the maintenance of favorable attitudes towards the body, taking care of the body, respecting the body and protecting the body by rejecting the often unrealistic standard of body beauty imposed by the media as being synonymous with beauty[42].

Regarding the results that had outcomes related to weight, BMI and waist circumference, participants maintained their weight, that is, there was no change in weight after the intervention, although this should not be seen as negative outcomes, since both interventions do not focus on weight loss. Weight loss can come as a consequence of the improvement in the subject's relationship with eating and with food, as well as the greater ability to be aware of the internal and external signs of eating. A systematic review with meta-analysis analyzed randomized controlled trials, and when comparing weight-related outcomes in studies with ME vs. those with conventional intervention programs showed that there were no significant differences[10].

The positive results of the biochemical variables are also justified by the improvement in food choices. Yoga exercises promote connection of body and mind, not only causing mental relaxation and reducing physical and mental stress, but also acts on the mechanism of humoral activity and the nervous system, therefore it is useful to reduce blood glucose[27] .

Of the 20 studies analyzed, only one showed a negative result, in which after the intervention there was an increase in scores related to the unwanted habit of "snacking" and a reduction in levels of self-compassion, without changing the levels of ME[20], with possible influence of limitations, which can justify the negative outcome of the intervention. First, the intervention was not performed by an instructor, being carried out by email, which may be one of the possible causes for the outcome of the reduction in self-compassion levels, as well as these could have had a high level of self-judgment in relation to their habits.

In addition, the outcome of the unwanted habit of "snacking" was measured through self-report (Self-Report Habit Index: SRHI) which can capture the subjective experience of the habit and not the actual habitual processes themselves[20]. Another factor is that these results may indicate a greater awareness of these habits through ME practices and not their increase. Regarding the non-alteration of ME levels, the study reports that participants may have overestimated their level of conscious eating in the first assessment, as the perception of eating without awareness is only observed after having contact with the practice[20].

CONCLUSION

The results found in this review suggest that the intervention based on mindful eating is capable of modifying individuals' eating habits towards healthier practices and also modifying the relationship they have with food. Added to this, together with programs that address intuitive eating, the results showed that this set can generate positive impacts on the perception that individuals have in relation to their own bodies, generating an increase in body appreciation.

It is suggested, then, that these interventions can be used to improve the subjects' relationship with food and issues related to the body, as well as the feelings that permeate these issues, contributing to the improvement of individuals' physical and mental health.

As limitations of this study, it is highlighted that this review included articles published in five different databases, but there may be data presented in other sources of scientific dissemination that were not reached. Another point is that the results presented refer only to international studies, which limits the generalization of the findings to the Brazilian population,

since there are still no studies developed and published in this population. On the other hand, the international findings presented then, should indicate the importance of the theme in the Brazilian scenario, as well as the very use of mindful eating and intuitive eating.

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Associated Publisher: Fernanda Carolina Camargo

CONTRIBUTIONS

Ana Flávia de Sousa Silva and **Fernanda Rodrigues de Oliveira Penaforte** contributed to the design, analysis and interpretation of data, writing and reviewing. **Camila Cremonezi Japur** participated in data collection and analysis, writing and reviewing. **João Henrique Fabiano Motarelli** worked on the writing and reviewing. **Taisa Alves Silva** and **Thamara Smatiotto Buttros** collaborated in data collection and analysis and reviewing.

How to cite this article (Vancouver)

Silva AFS, Japur CC, Silva TA, Motarelli JHF, Buttros TS, Penaforte FRO. Repercussions of mindful eating and intuitive eating approaches on the health of adult individuals: an integrative review. REFACS [Internet]. 2021 [cited in *insert day, month and year of access*]; 9(4):971-88. Available from: *insert access link*. DOI: *insert DOI link*.

How to cite this article (ABNT)

SILVA, A. F. S.; JAPUR, C. C.; SILVA, T. A.; MOTARELLI, J. H. F.; BUTTROS, T. S.; PENAFORTE, F. R. O. Repercussions of mindful eating and intuitive eating approaches on the health of adult individuals: an integrative review. **REFACS**, Uberaba, MG, v. 9, n. 4, p. 971-88, 2021. Available from: *insert access link*. Access in: *insert day, month and year of access*. DOI: *insert DOI link*.

How to cite this article (APA)

Silva, A.F.S., Japur, C.C., Silva, T.A., Motarelli, J.H.F., Buttros, T.S., & Penaforte, F.R.O. (2021). Repercussions of mindful eating and intuitive eating approaches on the health of adult individuals: an integrative review. *REFACS*, *9*(4), 971-88. Retrieved in: *insert day, month and year of access* from *insert access link.* DOI: *insert DOI link*.