



Based nutrition education on *Binge Eating Disorder* in young adults: Literature review

Pengaruh edukasi gizi berbasis mindful eating terhadap Binge Eating Disorder pada dewasa muda: Literatur review

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Abstract

Binge Eating Disorder (BED) is one of the most common psychological and social eating disorders worldwide and is recognized as a serious public health problem. One approach to improving BED is mindful eating (ME)-based nutrition education, which helps reduce emotional eating behaviors and improve the quality of food intake. This study aimed to determine the effects and changes obtained from ME-based nutrition education interventions in managing BED among young adults. This study was a narrative literature review. Articles were searched through databases such as Google Scholar, ScienceDirect, ProQuest, and PubMed using the PRISMA flow diagram. The inclusion criteria were experimental studies published between 2019 and 2024. The Joanna Briggs Institute (JBI) checklist was used to assess article quality. Two articles met the selection criteria. The review findings indicate that ME-based nutrition education can reduce the frequency of binge eating and improve eating behaviors. However, because these findings are based on a limited number of studies, generalization should be approached with caution. In conclusion, ME-based nutrition education has the potential to be an effective intervention for managing BED in young adults. Further research with larger sample sizes, rigorous experimental or longitudinal designs, and long-term evaluations is needed to confirm its effectiveness and widespread application.

Keywords: Binge eating disorder, mindful eating, nutrition education, young adults.

Abstrak

Binge Eating Disorder (BED) merupakan salah satu gangguan makan psikologis dan sosial yang umum terjadi di seluruh dunia dan menjadi masalah kesehatan masyarakat serius. Salah satu upaya untuk memperbaiki BED adalah edukasi gizi berbasis *mindful eating* (ME), yang membantu mengurangi perilaku makan emosional dan meningkatkan kualitas asupan makanan. Tujuan studi untuk mengetahui pengaruh dan perubahan yang didapat dari intervensi edukasi gizi berbasis ME dalam upaya penanganan BED pada dewasa muda. Penelitian ini merupakan literatur review dengan metode naratif. Pencarian artikel melalui basis data *Google Scholar*, *Sciencedirect*, *ProQuest*, dan *PubMed* dengan menggunakan alur PRISMA. Kriteria inklusi mencakup penelitian eksperimental yang diterbitkan antara tahun 2019 hingga 2024. Kualitas artikel dinilai dengan *checklist Joanna Briggs Institute* (JBI). Dari hasil seleksi, terdapat 2 artikel yang memenuhi kriteria. Hasil kajian menunjukkan bahwa edukasi gizi berbasis ME mampu mengurangi frekuensi *binge eating* dan memperbaiki perilaku makan. Namun, mengingat temuan ini didasarkan pada jumlah studi yang terbatas sehingga generalisasi hasil perlu dilakukan dengan hati-hati. Kesimpulan,

edukasi gizi berbasis ME berpotensi menjadi intervensi efektif dalam penanganan BED pada dewasa muda. Penelitian lanjutan dengan jumlah sampel lebih besar, desain eksperimental atau longitudinal dengan metodologi ketat, dan evaluasi jangka panjang diperlukan untuk memastikan efektivitas dan penerapannya secara luas.

Kata Kunci: *Binge eating disorder*, dewasa muda, edukasi gizi, *mindful eating*.

Introduction

Binge Eating Disorder (BED) is a serious eating disorder recognized as a public health issue with high social and economic impact (Feltner et al., 2022; Grilo & Juarascio, 2023). BED is characterized by the consumption of large amounts of food in a short period of time, accompanied by an uncomfortable feeling of fullness, and occurs at least once a week for three months (Mohajan & Mohajan, 2023; Ummi, 2023). This eating disorder often triggers feelings of regret and guilt due to excessive consumption patterns, which are often addressed by restricting the food intake. However, this can lead to stress, anxiety, depression, and repetitive behavior (Saraswati & Suarya, 2024).

BED is most commonly found in adults, occurring in both men and women, with an average age of onset of approximately 25 years (Grilo & Juarascio, 2023). The global prevalence of BED for 2018-2020 was estimated to be 0.6-1.8% in adult women and 0.3-0.7% in adult men, with an incidence ranging from 35 to 343 per 100,000 people per year. The World Mental Health Survey estimates that the prevalence of BED among adults varies greatly across countries (Giel et al., 2022).

In addition to affecting mental health, BED is closely associated with physical health issues. Research in the United States has shown that health conditions commonly associated with BED include obesity, hypertension (31%), heart disease (17%), arthritis (24%), high cholesterol (27%), diabetes mellitus (14%), and sleep disorders (29%) (Giel et al., 2022). These conditions underscore the need for appropriate and sustained treatment of BED.

Various approaches have been used to treat BED, including psychological, pharmacological, and non-pharmacological therapies. One non-pharmacological therapeutic approach is nutrition education intervention based on mindful eating. Mindful eating (ME) is the practice of eating with full awareness,

focusing on the present moment, and without judgment of eating habits (Minari et al., 2024). This approach helps individuals recognize feelings of hunger and fullness, understand the emotions that influence eating behavior, reduce impulsive responses, and build a more positive relationship with food (Al Rahmad et al., 2024).

ME-based nutrition education differs from conventional nutrition education in several ways. Conventional nutrition education generally emphasizes quantitative rules, such as calorie limits, macronutrients, and lists of recommended or avoided foods (Nelson, 2017). In contrast, ME-based nutrition education does not impose strict dietary rules but teaches mindful eating techniques, food diary tracking, sensory food analysis, and training in recognizing emotional eating triggers (Minari et al., 2024). This approach is expected to help individuals with BED naturally and sustainably regulate their eating patterns without the pressure of excessive restrictions.

Although various international studies have shown the benefits of ME, there have not been many studies that systematically discuss the effectiveness of ME-based nutrition education in adults in Indonesia, especially in the form of literature reviews. Therefore, this study aimed to explore the influence and evaluate the impact and changes resulting from ME-based nutrition education for the management of BED in adults. Thus, this literature review is expected to provide a deeper understanding and evidence of the influence of ME-based nutrition education on BED and can be used as a reference for developing future health and nutrition interventions for adults, especially in Indonesia.

Methods

This study used a narrative literature review. Articles were searched through the Google Scholar, ScienceDirect, ProQuest, and PubMed databases, covering national and international

articles. Keywords were compiled using Boolean operators, namely, nutrition education AND mindfulness-based intervention OR mindful eating s AND adults with binge eating disorder OR elders with binge eating disorder OR adults with overeating disorder OR elders with overeating disorder.

The literature search was conducted using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) approach (Figure 1). The search process began with the identification of articles from each database based on their titles, followed by abstract screening and eligibility testing based on the inclusion and exclusion criteria. The inclusion criteria were as follows: results of mindful eating-based nutrition education studies, the keyword "binge eating disorder," results of analysis used in trial studies or research articles, articles published between 2019 and 2024, free full-text articles, and open access articles. Articles that did not meet the inclusion criteria were excluded or did not proceed to the next stage of the review.

Article selection was conducted in pairs by two independent authors. At the extraction stage, articles that passed the selection were entered into a table containing the author and year of publication; research title; research

design consisting of research design, sample, treatment, intervention duration, statistical analysis, and nutrition education methods. Two articles that met the inclusion criteria were assessed for quality using the Joanna Briggs Institute (JBI) checklist. All articles were experimental studies with a trial study design and met the quality criteria of the JBI checklist.

The limited number of articles was due to strict selection criteria, including a specific focus on ME-based nutrition education for adults with BED, experimental research design, publications from 2019 to 2024, and free full-text and open access. The limitations of research in this context are also a contributing factor, given that the topic of ME for BED is still relatively new and has not been widely explored, especially in the form of ME-based nutritional interventions with experimental designs. Most studies on ME focus on overweight/obese populations without a specific diagnosis of BED; therefore, they do not meet the criteria. In addition, differences in terminology or research focus also contributed, where some studies used different terms (mindfulness-based intervention, intuitive eating) or focused on other eating disorders such as anorexia and bulimia, so they were not included in the final selection.

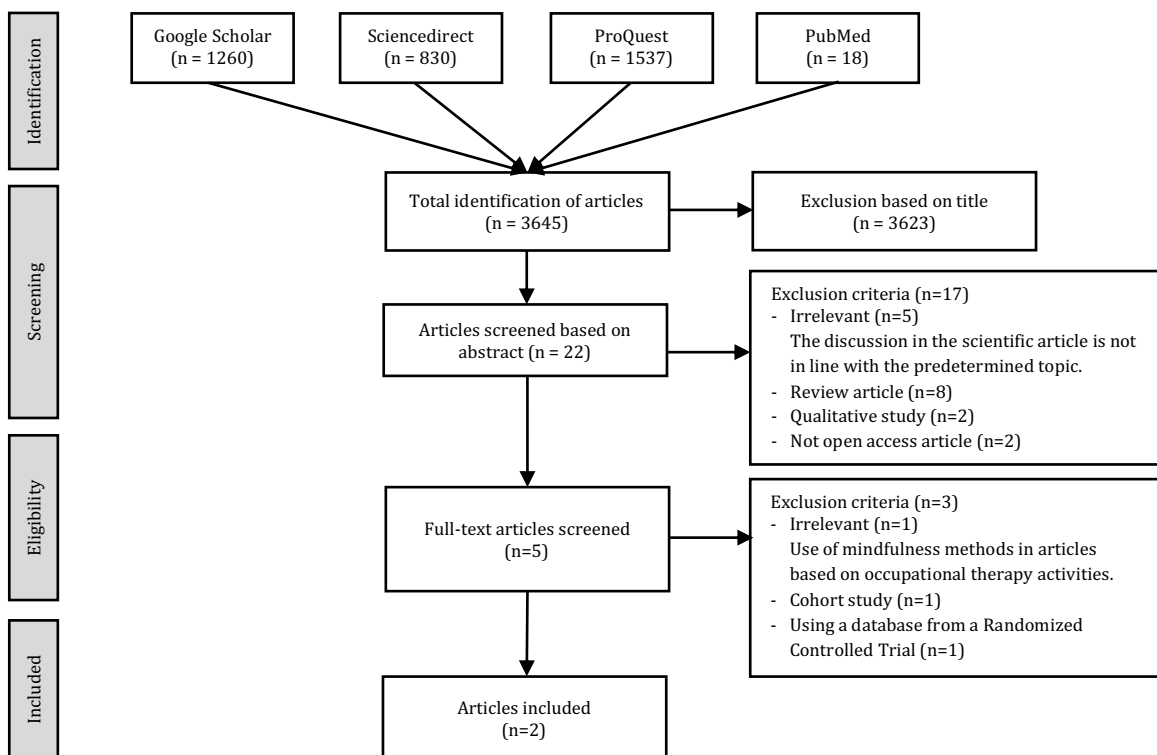


Figure 1. Literature search flow using the PRISMA method

Result and Discussion

Based on the established inclusion criteria, two relevant studies were selected. The results of

these two studies show that ME-based nutrition education is effective in reducing overeating in adults with BED. The results of these two studies are summarized in Table 1.

Table 1. Summary of articles according to research objectives

Author Name	Research Title	Research Design	Nutrition Education Method	Research Results
Minari et al. (2024)	Effects of Mindful Eating in Patients with Obesity and Binge Eating Disorder	Design: This was a prospective, longitudinal, and experimental study. Sample: 82 patients diagnosed with obesity and Binge Eating Disorder (BED). Aged ≥ 18 years; diagnosed with obesity ($\text{BMI} \geq 30 \text{ kg/m}^3$) and BED (according to DSM-5) Treatment: consisted of one intervention group without a comparison or control group. Intervention duration: Eight sessions over eight weeks (one session per week), with each session lasting approximately one hour. Statistical analysis: Shapiro-Wilk and Two-tailed Wilcoxon tests. Data analysis and graphing were performed using GraphPad Prism 9.0 software.	Combination of counseling and demonstration using Mindful Eating techniques	<ul style="list-style-type: none"> - Based on the research results, the Binge Eating Scale score decreased significantly ($p < 0.0001$) from 34 points in the first week to 30 points by the eighth week. However, even with the decrease in score, the patients' binge eating classification remained the same, namely, "Severe Binge Eating." - In the analysis of the number of binge eating episodes, a significant decrease ($p < 0.0001$) was detected from seven episodes in the first week to three episodes in the eighth week. - In the patients' food diaries, it was observed that patients consumed fewer calories (approximately -350 kcal) than before the intervention began, and an increase in water intake was also found ($p < 0.0001$).
Salvo et al., (2022)	Comparative effectiveness of mindfulness and mindful eating programs			<ul style="list-style-type: none"> - Based on the research results, the Mindfulness-Based Eating Awareness Training Sao Paulo (MB-EAT-SP) group experienced a decrease in binge eating (BES score), and a significant decrease in binge eating was also found for the MBHP (Mindfulness Based Health Promotion (MBHP) group).
(Salvo et al., 2022b)	among low-income overweight women in primary health care: A randomized			

controlled
pragmatic study
with
psychological,
biochemical,
and
anthropometric
outcomes

- Both groups showed an increase in eating behavior and a reduction in binge eating during both the post-intervention and follow-up periods, but without significant changes in body weight or most biological parameters.

Table 1 shows that there are two articles related to the keywords "nutrition education AND mindfulness-based intervention OR mindful eating AND adult with binge eating disorder OR elder with binge eating disorder OR adult with overeating disorder OR elder with overeating disorder." Both articles are scientific publications published in international journals, namely, MDPI and ScienceDirect. Based on the year of publication, two articles were published in 2022 and 2024. Mindful eating-based nutrition education for eight sessions over eight weeks reduced overeating disorders in 82 obese patients and BED in Brazil (Minari et al., 2024). In this ME-based intervention, patients were only encouraged to consume fewer ultra-processed foods and more natural and minimally processed foods. There were no dietary prescriptions for calories, carbohydrates, proteins, fats, or fibers. The respondents were instructed to use ME during their daily meals.

Based on measurements using the Binge Eating Scale (BES), patients' BED scores decreased from 34 in the first week of the intervention to 30 in the eighth week. Despite the decrease in BES scores, patients' binge eating classification remained the same, still falling into the "Severe Binge Eating" category. Based on the analysis of the number of binge eating episodes in respondents, there was a significant decrease from seven episodes in the first week to three episodes in the eighth week of intervention. This is most likely the result of self-control, hunger, satiety signals, and reduced excessive calorie intake (Minari et al., 2024).

Nutrition education based on ME has also been reported to reduce binge eating disorder in 240 adult women in São Paulo, Brazil (Salvo et al., 2022). Respondents were randomly assigned to one of three intervention control groups: the Mindfulness-Based Eating Awareness Training (MB-EAT-SP) group with 10 sessions plus treatment, the Mindfulness-Based Health

Promotion (MBHP) group plus treatment with eight sessions plus two additional sessions to reach the same number of sessions (10) as the MB-EAT-SP group, and the no-intervention/control group. MBHP has the primary goal of self-development in health through awareness and regular mindfulness practices, which are fundamental tools for managing daily stress, as well as for well-being and quality of life. MB-EAT-SP is a program that increases awareness of hunger, fullness, taste awareness, and triggers for eating.

Based on the results of the study, the MB-EAT-SP group experienced a decrease in binge eating (BES score), and a significant decrease in binge eating was also found in the MBHP group. However, in this study, MB-EAT-SP proved to be superior to the MBHP for binge eating intervention over time. Binge eating decreased from 40.7% before the intervention to 7.5% after the intervention, and increased from 16.7% after the follow-up for MB-EAT-SP. In the MBHP, the decrease was lower, from 34.1% to 25.4%, then 17.8% after follow-up, but it was statistically significant. Both groups showed improvements in eating behaviors and reductions in binge eating during both the post-intervention and follow-up periods, but without significant changes in body weight or most biological measures (Salvo et al., 2022).

Both studies show that, despite differences in design, population, and intervention methods, ME-based nutrition education is effective in reducing BED in adults. Minari et al. (2024), using an experimental approach on obese patients, found a significant reduction in binge eating frequency and calorie intake after an 8-week intervention, while Salvo et al. (2022) compared two mindfulness programs and showed that MB-EAT was more effective in reducing binge eating than MBHP in adult women with low socioeconomic status. These differences in context and methods reflect

heterogeneity, but similar results reinforce the benefits of ME as a non-pharmacological strategy for managing BED. However, both studies have limitations, such as variations in sample characteristics and relatively short intervention and follow-up durations; therefore, they cannot provide a picture of the long-term effects of ME in the treatment of BED, meaning that the results cannot be generalized widely.

The Effect of Mindful Eating-Based Nutrition Education on Binge Eating Disorder (BED) in Adults

Binge eating disorder (BED) is an eating disorder that affects approximately 3% of the population. Diagnosis generally consists of episodes of excessive eating at a high frequency, distress caused by overeating, and dissatisfaction with one's body image. Binge eating episodes are characterized by a loss of self-control over high food intake, far exceeding what the individual would normally eat. These episodes typically occur within a 2-hour interval and can reach an intake of 2000–5000 kcal per episode (Minari et al., 2024).

The prevalence of BED is most common among adults, both men and women, with an average age of onset of 25 years (Grilo & Juarascio, 2023; Udo & Grilo, 2018). Some studies indicate a higher prevalence among women (3.5-4%) than men (2%), with the largest age group for men being between 45 and 59 years old, while for women, it is young adults between 18 and 29 years old (Brownley et al., 2016). Research conducted by Minari et al. (2024) also found that the majority of BED respondents were women (57.3%), which may be because women tend to be more focused on body image and beauty standards than men (Sumanty et al., 2018).

The objectification of the body, which is more commonly experienced by women, increases the risk of anxiety and shame regarding physical appearance, which in turn triggers unhealthy eating behaviors (Chairani, 2018). Additionally, other triggering factors such as negative comments about body shape, physical abuse, negative mood, and compensatory behaviors also predict the onset of BED with an accuracy of 67–83%, which is a promising starting point for prevention programs (Giel et al., 2022).

Changes in modern lifestyles, social pressures, and new food trends also contribute

to the increase in eating disorders, such as BED (Umami, 2023). The prevention and management of BED can be achieved through interventions and programs involving educational and behavioral interventions targeting individuals, as well as larger-scale interventions targeting structural and situational factors at the community level (Giel et al., 2022). The goals of BED therapy include reducing or stopping binge eating episodes, improving eating patterns, managing mood, and enhancing quality of life (Mohajan & Mohajan, 2023).

The American Psychiatric Association (APA) practice guidelines for eating disorders recommend evidence-based psychological therapy as the first-line treatment for BED, which has been found to be sufficient for reducing binge eating (Bryson et al., 2024). This therapy is usually conducted on an outpatient basis but can be part of a partial or full hospital program with outpatient follow-up. The three main psychological therapies for BED are cognitive behavioral therapy (CBT), Interpersonal Psychotherapy (IPT), and Dialectical Behavior Therapy (DBT) (Giel et al., 2022).

Although CBT is the most widely researched evidence-based approach for treating BED, approximately 50% of patients relapse. This may be related to the fact that excessive concern with body shape and weight is only present in some individuals with BED. Therefore, DBT may be a suitable treatment for patients with BED, especially those with high impulsivity (Rahmani et al., 2018; Valdez-Aguilar et al., 2023). DBT was originally developed for patients with borderline personality disorder and self-harming behaviors but has been adapted to treat binge eating disorder (DBT-BED). DBT-BED aims to improve emotion regulation skills to replace excessive food consumption as a way to cope with negative influences (Lammers et al., 2021). Patients undergoing dialectical behavior therapy learn various skills, including mindfulness, emotion regulation, and distress tolerance (Eisner et al., 2017).

Mindfulness in DBT refers to full awareness of emotions and the body without judgment, which can be applied in the form of ME. ME involves full awareness while eating, including recognizing hunger, fullness, food quality, and emotional responses, and is usually accompanied by cognitive and behavioral

strategies (Cherpak, 2019; Tapper, 2022). This intervention can be conducted through group or individual sessions or digital platforms. In the context of nutrition education, ME teaches "why, when, how, what, and with whom" a person eats, thereby promoting sustainable behavioral change (Ramadhani et al., 2024; Citra et al., 2023).

The results of the two articles that met the inclusion criteria reinforce the potential of ME-based nutrition education in reducing binge eating in adults. An experimental study conducted by Minari et al. (2024) on 82 obese patients and BED for 8 weeks based on the dynamics of nutrition education in the "Dietary Guidelines for the Brazilian Population—Ministry of Health/Brazil" and "Integral Nutritional Care Program—Mindful Eating" revealed that ME can reduce binge eating episodes, improve self-control, regulate hunger/satiety, and reduce excessive calorie intake. These effects are thought to stem from increased eating awareness, satiety effects, and indirect weight reduction due to changes in calm eating behavior.

A study conducted by Salvo et al. (2022) on 240 adult women compared ME-based nutrition education with training and practice methods using Mindfulness-Based Health Promotion (MBHP) and Mindfulness-Based Eating Awareness Training (MB-EAT) techniques. The results showed that MB-EAT was more effective in reducing binge eating (decreasing from 40.7% before the intervention to 7.5% after the intervention) than MBHP, which showed a lower reduction (from 34.1% to 25.4% after the intervention). The superiority of MB-EAT is due to its more specific focus on eating behavior than general mindfulness interventions.

Meanwhile, outside the context of BED treatment therapy, the effect of EMPIRE (Emotion and Mind Power in Relationship with Eating) nutrition education by Citra et al. (2022), which uses video as a nutrition education tool, showed a significant decrease in energy, protein, fat, carbohydrate, and sugar intake ($p < 0.05$). This decrease may have occurred due to individual nutritional guidance and counseling, which made it easier for respondents to understand and apply the education provided. ME may also be effective in correcting eating disorders related to "liking" versus "wanting" food. In addition, ME helps in choosing quality and enjoyable foods and eliminating

disturbances during the eating process. Thus, a person can be more aware of the impact of unhealthy eating habits (Munsch et al., 2019; Citra et al., 2022).

Based on the review of two articles, it was found that nutrition education based on ME, using counseling and demonstration methods, as well as training and practice, effectively reduced or decreased overeating in young adults with BED. ME can be an alternative treatment for BED in adults, which can then be applied in Indonesia.

Practical Implications in the Field of Nutrition

The results of this review show that ME-based nutrition education has the potential to be an effective intervention for reducing BED in young adults in Indonesia. This intervention can be implemented by nutritionists or dietitians who have received special training in the ME approach. Education can be provided individually or in groups through nutrition counseling services at community health centers, nutrition clinics, and hospitals, either face-to-face or online. Given technological developments and high Internet penetration, ME also has the potential to be developed through digital platforms, such as health applications or community-based health promotion programs at the community health center level. This approach allows for a wider reach, cost efficiency, and adaptation of materials to local cultural values, thereby increasing program acceptance and success.

Limitations of Study

This literature review has some limitations. The number of articles that met the inclusion criteria was very small ($n = 2$), which limited the validity of the conclusions. This is influenced by the strict selection criteria, the novelty and rarity of ME for BED as a topic in ME-based nutrition education with experimental designs, and the predominance of studies in overweight/obese populations without a specific diagnosis of BED or with different focuses and terminologies. Variability in the methodology, population, and study context also affects the generalizability of the findings.

In addition, as a literature review, the findings are highly dependent on the quality and diversity of previous studies, which generally measure the short-term effectiveness of ME with

limited data on long-term effects and biological mechanisms. The implementation of ME in Indonesia also has the potential to face challenges, such as time constraints and a fast-paced eating culture that hinders consistency in practice. Further experimental and longitudinal research is needed to test the effectiveness of this intervention in a more in-depth and contextual manner in Indonesia

Conclusion

Two relevant research articles show that mindful eating (ME)-based nutrition education can improve eating behavior and reduce overeating in patients with binge eating disorder (BED). In addition, ME may also have the potential to help restore patients' nutritional status, reduce body image dissatisfaction, and improve their quality of life. However, these findings are based on a limited number of studies; therefore, the results should be generalized with caution. Thus, ME-based nutrition education has the potential to be an effective intervention for treating BED in young adults.

Further research should involve larger sample sizes, experimental or longitudinal designs with rigorous methodologies, and evaluations of the long-term effectiveness of mindful eating. Future studies should also consider cultural differences, eating habits, and the availability of facilities in Indonesia, including the potential application of mindful eating through digital platforms and community-based programs. This approach is expected to provide stronger and more contextually relevant evidence for field implementation.

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