

Master Thesis  
**Use and Effectiveness of Mindfulness-based Cognitive Therapy in the treatment of  
Binge Eating Disorder – A scoping Review.**

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## Abstract

**Introduction:** In recent years, Mindfulness-Based Cognitive Therapy (MBCT) approaches gained popularity in treating binge eating disorder (BED), the most common eating disorder. Individuals suffering from BED lose control over their eating behaviour and take in large amounts of food in a short period of time. Next to the psychological distress, overweight is often a problem. As research according to this topic is still developing, an overview is needed to formulate future research goals and MBCT effectiveness and efficacy. This scoping literature review aimed to summarise the existing studies using MBCT for the treatment of BED. **Method:** A literature search via Scopus, Web of Science, PubMed, and Google Scholar was conducted. Following the PRISMA guidelines, articles were carefully screened for the inclusion criteria of being written in English, entailing empirical data, and handling MBCT as a treatment approach for clinical or sub-clinical samples. Ten studies were included in the review. **Results:** The results of the studies showed that MBCT is a promising approach for BED treatment. The ten studies of this review included one Randomised Controlled Trial (RCT), one case study, and eight smaller sample pilot studies with four studies providing follow up data. The targeted underlying mechanisms of BED were levels of awareness, Mindfulness, and the feeling of losing control. These could be improved with the help of MBCT. Furthermore, comorbid depression scores were decreased. The results showed to be stable in follow up data. Furthermore, an improvement in depression score could be observed. Surprisingly, the participants could not lose as much weight as expected by following a stand-alone MBCT treatment approach. One study that directly compared MBCT and Cognitive Behavioural Therapy (CBT) showed that MBCT was more effective in treating BED. **Conclusion:** MBCT was rated by the studies included in this review as a valuable approach for treating BED for clinical and sub-clinical samples. Binge eating symptoms could significantly be reduced with MBCT. Actual weight changes seemed to be challenging to achieve for participants. Future research should consider larger-scale RCTs to explore the efficacy of MBCT.

*Keywords:* Binge Eating disorder, Mindfulness-based cognitive therapy, meditation, eating disorder, effectiveness, scoping review

## **Use and Effectiveness of Mindfulness-based Cognitive Therapy in the treatment of Binge Eating Disorder – A scoping review**

Binge Eating Disorder (BED) is the most common eating disorder that causes extreme distress for those who suffer from it (Duarte et al., 2017). BED is described by the frequent and uncontrollable intake of large amounts of food in a short time. (American Psychiatric Association [APA], 2013). In the last edition of the *Diagnostic and Statistical Manual of Mental Disorders (5th. ed, DSM -5)* (APA, 2013), BED has become a diagnosis under the spectrum of Feeding and Eating Disorders (FED), in addition to Pica Disorder, Rumination Disorder, Avoidant or Restrictive Food Intake Disorder, Anorexia Nervosa (AN), Bulimia Nervosa (BN), and other specified or unspecified Eating Disorders (APA, 2013; Lindvall Dahlgren et al., 2017).

BED is associated with a high prevalence of physical (e.g., coronary heart disease, diabetes, etc.) and mental health comorbidities (e.g., mood and anxiety disorders, depression, etc.) (de Zwaan, 2001; Sheehan & Herman, 2015; Thornton et al., 2017). Individuals who suffer from BED symptoms experience high psychological distress because of excessive eating episodes and the loss of control which often causes feelings of guilt and shame (Tuschen-Caffier & Hilbert, 2016). Furthermore, individuals with BED show a higher level of alexithymia, a condition that describes an individual as being unable to recognise and express one's emotions ('blind for emotions') (Pinaquy et al., 2003). Alexithymia is a risk factor for suicidality (Carano et al., 2012). Previous research has shown that the positive relation between alexithymia and BED is an alarming sign and is of fundamental relevance regarding BED treatment (Carano et al., 2012). Also, Conti et al. (2017) describe a significant relationship between BED and suicidality or suicidal ideation. The severity of BED is defined as one of the most critical risk factors that predict this relationship. With a prevalence rate of 1%-3.5% in the general population, BED is more common than other FEDs (Ágh et al., 2016; Kessler et al., 2013; Mustelin et al., 2017; Preti et al., 2009). Initially, research assumed that BED primarily affects young adults, mainly between 20 up to 30 years. More recent studies also show that the disorder already plays an important role in adolescence and even childhood. The average age of BED onset ranges from late teens to early twenties (Amianto et al., 2015; Kessler et al., 2013). The gender distribution shows that more females compared to males are affected by BED (Assari, 2018; Barry et al., 2002). According to Spitzer et al. (1993), 1.5 times more women suffer from BED than men.

Recurrent binge eating episodes are the main characteristic of BED. The *DSM-5* defines binge eating episodes as characterised by eating much food in a distinct period and a simultaneous occurring of a feeling of losing control over the eating behaviour (e.g., not being

able to stop eating). Furthermore, at least three of the following additional characteristics are associated with a binge episode: Individuals eat faster than average, they ignore feelings of being full, they eat although not being physically hungry, they eat secretly and feel shame and disgust for the binge eating and themselves (APA, 2013). The binge eating needs to cause distress and appear on average at least once a week during the last three months (APA, 2013). One important difference with BN is the absence of compensatory behaviour like vomiting or laxative misuse (APA, 2013). The severity of BED is categorised by the frequency of binge eating episodes per week in four stages. A mild form equals one to three binges per week, a moderate form is described by four to seven binges per week, eight to 13 binges per week characterise a severe condition, and an extreme form is apparent when an individual binges 14 or more times per week (APA, 2013).

Research shows that the reward system plays an essential role in understanding behaviour like binge eating (Doucette et al., 2015; Hildebrandt et al., 2018). The reward system is concerned with the reward of behaviour in the brain by neurotransmitters (like dopamine) activating positive feelings (Chepkwony & Oloko, 2014). The release of neurotransmitters leads to a positive reinforcement letting individuals learn that the behaviour has a positive consequence. This is called associative learning, which means that a connection between an initially neutral stimulus and an incentive salience is built (Roos et al., 2021). Incentive salience means the cognitive process of wanting something. In BED, the incentive salience is created through positive reinforcement of binge eating by rewarding neurotransmitters, which are released while eating (Roos et al., 2021). Therefore, individuals suffering from BED learn that eating is something positive and try to compensate for negative emotions with the help of this learned connection (Roos et al., 2021). This results in pathological eating behaviour that is characterised by binge eating episodes in response to negative triggers.

Considering the complex underlying mechanisms of BED, there has been a growing interest in exploring practical therapeutic approaches to improve the psychological status of individuals suffering from BED.

### **Common Treatment Approaches in Binge Eating Disorder**

For BED, several treatment options have been explored in the past, including pharmacotherapy and psychotherapy. The Treatment as Usual (TAU) includes therapeutic approaches like cognitive-behavioural therapy (CBT), which is so far one of the most effective therapeutic strategies in BED treatment (Gorin et al., 2003; Linardon et al., 2017). For BED and other EDs, an adapted form of CBT as a stand-alone therapy option or

combined with behavioural weight loss therapy (BWL) and pharmacotherapy is generally used (Hilbert et al., 2017; Q da Luz et al., 2021). BWL therapy focuses on weight reduction. It could not provide comparable positive outcomes with CBT as a stand-alone treatment option which is why it is only used in combination with CBT (Q da Luz et al., 2021).

Pharmacotherapy focuses, for example, on the intake of antidepressants, antiepileptic medication, and appetite suppressants (Reas & Grilo, 2008). So far, although the evidence of pharmacotherapy for BED is growing, it did not reach, as a stand-alone treatment, comparable positive results to psychotherapy. Therefore, pharmacotherapy is mainly combined with psychotherapy, where it can prompt superior results (Iacovino et al., 2012; Q da Luz et al., 2021; Reas & Grilo, 2008, 2015).

The Rationale for using CBT as a treatment for BED is the restraint model (Iacovino et al., 2012). This model describes that strict avoidance of calorie intake caused by uncontrolled eating patterns and overrating weight and shape results in a vicious cycle of over and under restriction (Iacovino et al., 2012; O'Reilly et al., 2014). This imbalance of restriction is seen as a trigger for binge eating behaviour. CBT, therefore, views BED as a cycle of dieting, losing control and bingeing (Baer et al., 2005; Iacovino et al., 2012)

The most commonly used CBT protocol for BED treatment is the CBT enhanced for Eating Disorders (CBT-E) (Q da Luz et al., 2021). CBT-E aims to stabilise the eating behaviour of the individual by helping to understand and to change it, working on the negative cognitions about weight and shape to relieve some distress, establish coping mechanisms and skills for dealing with negative emotions that work as triggers and preventing relapse (Fairburn, 2008; Iacovino et al., 2012; Q da Luz et al., 2021). For CBT-E, a “focused” and “broad” form exist, where the focused form is used for individuals suffering from BED (Fairburn, 2008). This focused form includes four stages that are addressed in twenty sessions in total. CBT-E is a transdiagnostic approach for several EDs. Therefore, some adaptations need to be made to treat BED (e.g., cutting out components addressing extreme weight control). According to Q da Luz et al. (2021) and Fairburn (2008), one contraindication for using CBT-E is comorbidities like severe depression, substance abuse, and suicidal ideation. These conditions can hinder the individuals' ability to follow CBT-E as a treatment. Overall, studies showed that many participants (around 50%) who follow a CBT treatment for BED remain symptomatic after the end of the therapy and CBT approaches remain only partially successful in supporting weight loss (Agras et al., 1997; Godfrey et al., 2015; Grilo et al., 2016; Juarascio et al., 2017; Woolhouse et al., 2012).

One alternative psychotherapy option for those individuals who did not respond to CBT is Interpersonal Therapy (IPT) (Iacovino et al., 2012). It was expected that because IPT addresses binge eating as a coping mechanism for interpersonal conflicts, this would help those who failed to respond to CBT (Q da Luz et al., 2021). IPT focuses on searching for solutions by teaching individuals to actively deal with the problem and change the situation (Lipsitz & Markowitz, 2013). In BED treatment, social surroundings and self-perception are addressed and worked on (Lipsitz & Markowitz, 2013). Research has shown that IPT is a promising approach for BED treatment but that both IPT and CBT still leave many participants symptomatic at the end of therapy. This indicates that alternative treatment options need to be researched (Agras et al., 1995; Wilfley et al., 2002).

Because of these aspects of CBT and IPT, Mindfulness-based Cognitive Therapy (MBCT) research has increased exponentially as an alternative to TAU. Various studies have described the Rationale for using a mindfulness-based method to treat ED (including BED, AN, and BN) (Katterman et al., 2014). MBCT entails creating awareness of internal body states, the raising of self-acceptance, self-compassion and flexibility (Katterman et al., 2014)

### **Mindfulness-based Cognitive Therapy in Binge Eating Disorder Treatment**

The MBCT approach is an acceptance- and mindfulness-based response to the classical CBT approach (Smith et al., 2008). MBCT is a group-based intervention, combining CBT elements with mindfulness training to enable sufferers to deal with symptoms like stress, pain, or complicated feelings (Smith et al., 2008; Tickell et al., 2020). For BED, MBCT uses meditations and awareness training to teach patients to notice internal feelings like being full or to deal with difficult emotions more effectively (Courbasson et al., 2010; Kristeller et al., 2014).

The Rationale for using MBCT for treating BED is explained in the emotion dysregulation model (Baer et al., 2005; Duarte et al., 2014; Monell et al., 2015). Individuals who suffer from BED have a decreased ability to describe and identify emotions and tend to use more dysfunctional regulation strategies than others (Monell et al., 2015). Binge eating is seen as one of these dysfunctional coping mechanisms. Individuals tend to binge when confronted with negative emotions to escape these (Baer et al., 2005). More recent studies suggest that a negative body image causing shame and self-criticism, instead of only negative emotions, better explain the BED symptomatology (Duarte et al., 2017; Dunkley & Grilo, 2007; Pinto-Gouveia et al., 2019)

The core element of the mindfulness-based approach is the idea of changing not the content of cognition but the individual's attitude towards these cognitions (Baer et al., 2005;

Courbasson et al., 2010). When a view of an objective observer is taken, this meta-cognition helps to accept the distress that is experienced and gives a basis to change the behaviour build upon this acceptance (Courbasson et al., 2010). One of the central goals of MBCT is increasing the levels of Mindfulness and wellbeing of suffering individuals (Katterman et al., 2014). As Shapiro et al. (2006) describe, the concept of Mindfulness is built on the three fundamental blocks of *intention, attention, and attitude*. These central themes are connected and co-occur. Combining these three aspects makes the mindfulness approach a "moment-to-moment process" (Shapiro et al., 2006). To reach this status of being present in the moment and non-judgementally accept thoughts, different techniques are used like mindful-eating exercises, meditations, body scans, and self-observation tasks. These exercises can be found in various interventions like the Mindfulness-based stress reduction (MBRS), Meditation-based eating awareness training (MB-EAT), the Mindful eating and living (MEAL), the Compassionate Attention and Regulation of Eating Behaviour intervention (CARE), or the Mindfulness action based cognitive therapy (MACBT) (Baer et al., 2005; Courbasson et al., 2010; Dalen et al., 2010; Duarte et al., 2017; Kristeller et al., 2006; Kristeller & Hallett, 1999; Smith et al., 2006).

### ***Mindfulness-based Approaches***

In this review five different Mindfulness interventions were used in the included studies. The hypothesis of Smith et al. (2006) for using an MBSR approach, which mainly focuses on reducing stress by using mindfulness components, was that an increase in self-awareness and -acceptance would help participants reduce their binge eating. This built upon the idea of Kristeller et al. (2006) that not changing the negative thoughts but viewing them from a more holistic point of view is vital in treating BED. In the here included studies, different MBCT approaches and protocols were used.

The MB-EAT is a mindfulness-based training that includes elements from CBT and MBRS with other eating meditations specially developed to treat BED (Kristeller et al., 2006). This intervention starts with binge eating in a cycle of negative emotions and binging as a response that can be broken by teaching awareness for healthier behaviours and bodily sensations like being full (Kristeller et al., 2006). According to Kristeller et al. (2006), the advantage of this mindfulness-based intervention compared to CBT addressed the dysfunctional coping mechanism of escaping by eating and establishing relapse prevention by teaching an unjudgmental attitude towards self-perception and body image. Furthermore, this facilitated maintenance and better internalisation of functional coping strategies (Kristeller et al., 2014; Kristeller et al., 2006; Kristeller & Hallett, 1999).



The MEAL intervention is specially designed for individuals with obesity to lose weight (Dalen et al., 2010). This intervention focuses on the advantages of Mindfulness by not only changing the negative thinking but viewing the thought process from all kinds of perspectives and trying to implement a better perception of the body (Smith et al., 2006).

The CARE intervention is a self-help compassion- and mindfulness-based intervention. The Rationale of this intervention is that an increased self- and body awareness can reduce binge eating. Furthermore, the underlying mechanisms of the CARE intervention are based on compassion, which facilitates the maintenance of therapy effects (Duarte et al., 2017).

MACBT integrates components from CBT and mindfulness training to decrease the symptoms related to BED. The intervention consists of parts entailing Mindfulness, mindful eating, psychoeducation, balanced physical activity, and focus on strengths. The central theme of the intervention is to teach participants how to regulate emotions without using food or other substances for help (Courbasson et al., 2010).

### **Body Mass Index**

One essential instrument to measure the effectiveness of the BED interventions, besides reduced symptoms, is the Body Mass Index (BMI). The BMI is a measurement that assesses a person's health status of body weight through the indices of weight and height (Prentice & Jebb, 2001). With the help of the BMI, the body fat status of a person can be easily compared at different time points. The BMI is used in many studies to examine if progress has taken place after the intervention, as weight loss or weight maintenance is among the essential goals in treating BED next to reducing binge eating episodes. A BMI lower than 18.5 kg/m<sup>2</sup> is considered underweight. The normal weight ranges from 18.5kg/m<sup>2</sup> to 24.9 kg/m<sup>2</sup>. A BMI higher than 25 kg/m<sup>2</sup> up to 29.9 kg/m<sup>2</sup> is considered overweight. A person is categorised as obese with a BMI higher than 30 kg/m<sup>2</sup>. In obesity three additional severity categories are defined (class I: 30.0-34.9 kg/m<sup>2</sup>, class II: 35.0-39.9 kg/m<sup>2</sup>, class III: ≥40 kg/m<sup>2</sup>).

### **The Rationale of this Scoping Review**

Still, there is a gap in the literature that synthesises explicitly the effectiveness of mindfulness-based approaches used for clinical and sub-clinical BED. Previous reviews on psychotherapy treatment of BED have mainly summarised studies that concentrate in general on third wave therapies for BED treatment, like Acceptance and Commitment Therapy (ACT) or Dialectical Behavioural Therapy (DBT) in addition to MBCT. Furthermore, other reviews focused not only on BED but also on emotional eating and overweight without binge eating

symptomatology (O'Reilly et al., 2014). As research on the effectiveness and value of MBCT for BED is still limited, this review should focus on representing the size and scope of the already available literature. Therefore, a scoping review was chosen to cover the present research (Grant & Booth, 2009). A scoping review was estimated as being most suitable compared to a meta-analysis as the number of quantitative studies is still limited (Grant & Booth, 2009). This scoping review covers existing literature using a mindfulness-based approach to treat BED, with the intent to determine the status of research in clinical and sub-clinical populations, assets of MBCT and future research directions.

The overall objective of this scoping review is to give an overview of the use of MBCT for BED and to summarise the evidence for the effectiveness of MBCT in BED therapy. To answer this general objective, several secondary objectives are addressed. This provides a better overview of the currently existing programs and sheds light on where further research is needed. Furthermore, relevant advantages and limitations of MBCT for BED are addressed to examine the efficacy and effectiveness of MBCT. It is described which of the underlying mechanisms that lead to BED are addressed in mindfulness-based therapy. This can provide clues where the MBCT treatment prepares to break the circle of shame and binge eating. To answer these objectives, the following research questions are formulated:

*RQ<sub>1</sub>*: "What are the underlying mechanisms of BED addressed with MBCT?"

*RQ<sub>2</sub>*: "What are the different MBCT interventions used for the treatment of BED?"

*RQ<sub>3</sub>*: "What are the components of MBCT used for the treatment of BED?"

*RQ<sub>4</sub>*: "What are the advantages of MBCT in BED treatment compared to other psychological interventions?"

*RQ<sub>5</sub>*: "What are the potential limitations of MBCT in BED treatment?"

## **Methods**

A comprehensive literature search for peer-reviewed articles providing quantitative or qualitative data in the form of pilot studies, preliminary studies, or RCTs was conducted. The databases *Scopus* (1975-2021), *Web of Science* (1975-2021), *PubMed* (1975-2021), and *Google Scholar* were used for literature search in April 2021. These databases were chosen to cover the extensive field of psychology, medicine, and other sciences. Google Scholar was primarily used for additional searches and to check the comprehensiveness of the literature search. Furthermore, the reference sections of already existing literature reviews by Katterman et al. (2014) and Godfrey et al. (2015) were scanned manually for valuable studies.

As search terms, the following expressions with Boolean operators were used to find relevant studies "Mindfulness meditation", "Mindful Eating", "Mindfulness-based cognitive therapy", "Mindfulness-based eating awareness training", "Mindfulness- and acceptance-based treatment", "Weight-related eating behaviour", "Overeating", "Binge eating disorder", "Binge eating" (Table 1).

The screening was done independently by one researcher following the PRISMA guidelines (Moher et al., 2009). First, the titles and abstracts of the search results were screened to find relevant studies. In a second step, the identified articles were screened further to decide whether to include or exclude the studies from the review (Figure 1). As inclusion criteria, studies had to entail empirical data about the application of MBCT in treating BED. They needed to focus on either clinical BED or sub-clinical (less than one binge-eating episode per week or binge eating for less than three months) binge eating symptoms. Furthermore, studies had to be reported in English.

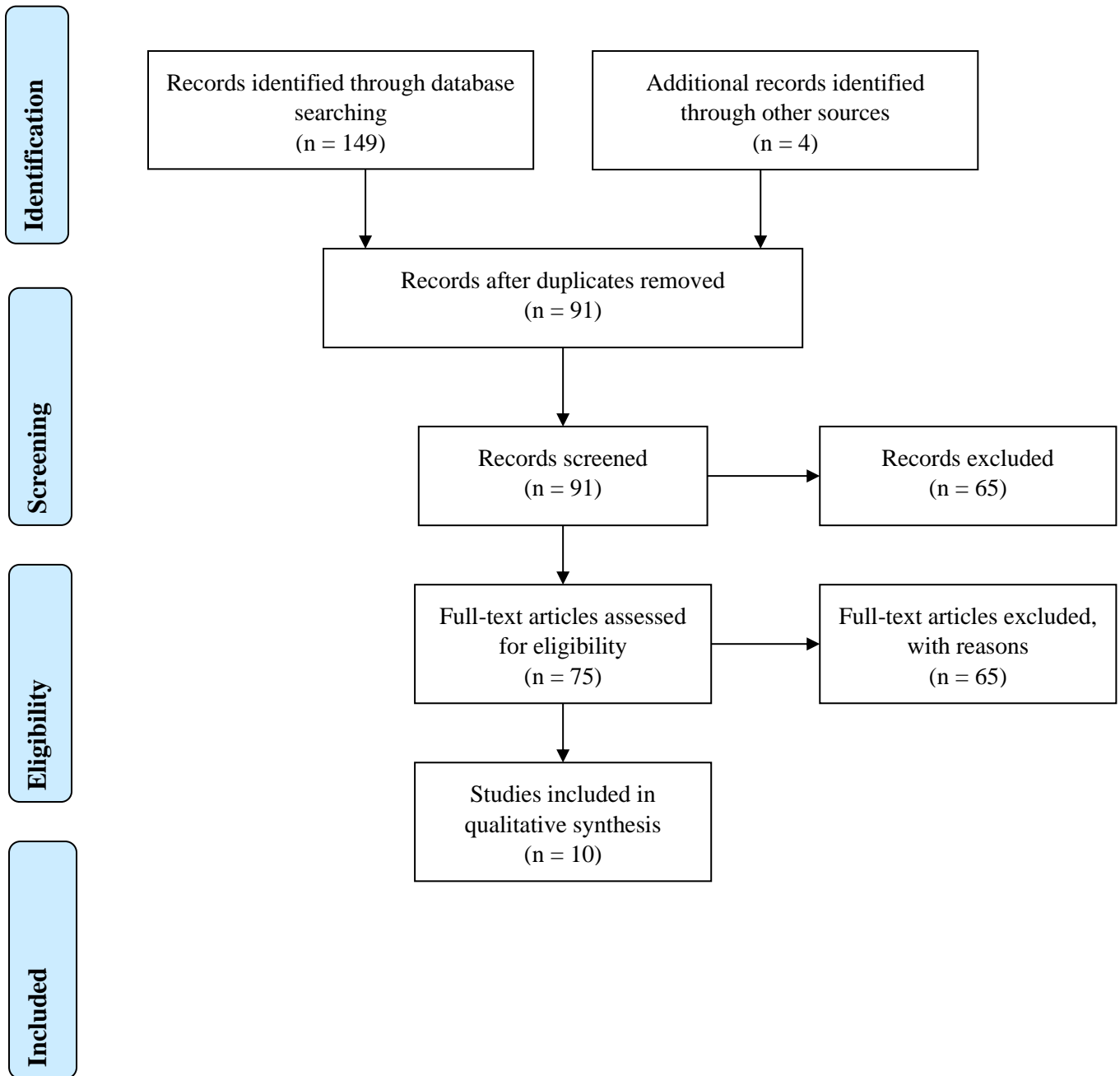
**Table 1.**

*Used search string in different databases*

Database	Search string
Scopus	(“Mindfulness meditation” OR “Mindful Eating” OR “Mindfulness-based cognitive therapy” OR “Mindfulness-based eating awareness training” OR “Mindfulness- and acceptance-based treatment”) AND (“Weight-related eating behaviour” OR “Overeating” OR “Binge eating disorder” OR “Binge eating”)
Web of Science	(“Mindfulness meditation” OR “Mindful Eating” OR “Mindfulness-based cognitive therapy” OR “Mindfulness-based eating awareness training” OR “Mindfulness- and acceptance-based treatment”) AND (“Weight-related eating behaviour” OR “Overeating” OR “Binge eating disorder” OR “Binge eating”)
PubMed	(“Mindfulness meditation” OR “Mindful Eating” OR “Mindfulness-based cognitive therapy” OR “Mindfulness-based eating awareness training” OR “Mindfulness- and acceptance-based treatment”) AND (“Weight-related eating behaviour” OR “Overeating” OR “Binge eating disorder” OR “Binge eating”)

**Figure 1**

Prisma Flow chart



## MINDFULNESS BASED COGNITIVE THERAPY IN BINGE EATING DISORDER

**Results****Table 3.**

Summary of the studies centred on interventions for reducing binge eating behaviours

Study (author and date)	Aims	Diagnoses	Used Instruments	Sample (age (SD), gender, BMI (SD))	Mindfulness components	Procedure	Results
Baer et al. (2005)	A pilot study to examine the application of Mindfulness and acceptance-based treatment approaches to disordered eating	Six clients with full DSM-4 criteria for BED. Four did not meet the criteria of frequency but all others. Comorbidities with Alcohol abuse or dependence, bulimia and Bipolar II disorder.	-EDE -BES -EEI -KIMS -BDI-II	N = 10 Age: 23-65 Gender: 100% females BMI: 22-40	MBCT -Body scan -mindful stretching -mindful eating exercises -meditations	Ten sessions programme, participants were split for Treatment into three small groups	Improvements in symptoms for binge eating symptoms

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Courbasson et al. (2010)	A pilot study searching for an approach that can treat binge eating and substance use	Coexisting BED-SUD 75% Alcohol use 36.4% Cannabis use	-SCID-II -EDE-Q -ASI -BDI-II	N = 38 Age: 42 (10.96) Gender: 79% females BMI: >30 (28 with medical complications from binge eating)	MACBT -Mindfulness -Mindful eating -psychoeducation -balanced physical activity -focus on strengths	16-week group sessions, 2 hours each session -brief mindfulness exercise at the beginning -participants engaged in self-monitoring at home	Binge eating decreased, Substance use decreased, Depression symptoms decreased
Dalen et al. (2010)	A pilot study to mindfulness training for obese participants	Sub-clinical binge-eating behaviour	-KIMS -weight and inflammation markers	N = 10 Age: 44 (8.7) Gender: 70% female BMI: 36.9 (6.2)	MEAL -mindfulness meditation -group eating exercises -group discussions -sitting meditations	6-week programme in 2 hours weekly sessions	Weight decreased in all participants, and binge eating decreased.

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-eating meditations  
 -light yoga  
 -walking meditations  
 -assignment of 10 minutes mindfulness meditation for each day

Results remained stable at least at trend at three-month follow-up

Duarte et al. (2017)	A pilot study testing the efficacy of compassion, Mindfulness, and acceptance-based interventions for BED	Full DSM -5 criteria for BED diagnosis	-BMI -EDE -BES -BISS -DASS21 -CFQ-FC -BIAAQ -FFMQ -CAAS -SCS -FSCRS	Total N = 20 Age: IC 37.73 (7.50) WLC.: 35.78 (9.08) Gender: 100% Females BMI: IC 31.89 (6.25) WLC 31.89 (6.25)	CARE intervention -psychoeducation <i>Mindfulness</i> -body scan -Mindfulness of the breath -mindful eating - soothing rhythm breathing -Awareness of the moment <i>Compassion</i>	Participants assigned to the intervention attended a 2 ½ hour group session containing a psycho-educative presentation on difficulties for regulating	Significant reduction in BED symptoms. Results remained stable at a one-month follow-up
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			-Feedback data			-arousing compassionate feelings when experiencing eating and body image problems -compassionate imagery practice	eating. The presentation also focuses on Mindfulness and Acceptance. After the session, participants were given a program with instructions to go through a 4- week intervention	
Kristeller and Hallett (1999)	A pilot study searching for evidence for the efficacy of MBCT in the	Full DSM -4 criteria for BED diagnosis	-QEWP-R -BES -BDI -BAI	N = 18 Age: 46.5 (10.5) Gender: 100% females BMI: 40.3		-general mindfulness meditation -eating meditation -mini-meditations	Seven sessions over six weeks. At the beginning of each session,	Binge eating episodes decreased and remained stable till the



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	Treatment of BED					the process was discussed	three-week follow-up
Kristeller et al. (2006)	A case study describing how Mindfulness and acceptance- based interventions can be used in the treatment of eating disorders	Full DSM-4 criteria for BED diagnosis	-BMI -BDI-II -EDE	N = 1 Age: 56 Gender: 100% females BMI: 41,8	MB-EAT -mindful eating exercises -meditation -mini-meditations -assignments	Group therapy with nine sessions	The number of binges dropped steadily. The weight began to drop in the six months following treatment.
Kristeller et al. (2014)	A RCT design finding evidence for the effectiveness of MB-EAT for binge eating individuals by comparing MB- EAT to Psychoeducatio	66% full DSM-5 criteria for BED diagnosis; others reported fewer binges per month	-EDE -BES -TFEQ -PFS -ESES -BDI -RSE -BMI	N = 150 Age: 46.55 Gender: 88% female BMI: 40.3	MB-EAT -general mindfulness (breath/ open awareness) -mindfulness meditations -guided eating meditations -mini-meditations	Comparing two groups: one received psychoeducati on, one MB- EAT. Manualized 12-session intervention (9-weekly	95% of the individuals who followed MB-EAT did not meet the BED criteria anymore. 76% of the Participants who received

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	n and Wait for list Control					Psychoeducational CBT -education on obesity and binge eating Skill-building exercises on nutrition, etc.	sessions, three booster sessions)	psychoeducati on did not meet the BED criteria anymore. Results remained stable at one- and 4-months follow-up
Leahey et al. (2008)	A pilot study designing an intervention to reduce binge eating and enhance wellbeing in bariatric surgery patients	criteria for binge eating in bariatric surgery patients (i.e., loss of control while eating and guilt associated with the eating episode)	-BMI -EDE -EES -ESES -BDI-II -DERS - SOCRATE S - Posttreatme	N = 7 Age: 49-64 Gender: 85.7% females BMI: 35.0-52.4	-emphasis on creating a positive environment -instilling hope and motivation -assessed eating behaviour -examined problematic and successful eating events	Ten-week group therapy for 75 minutes per meeting	Participants reported reductions in binge eating	

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			nt Group		-discussed		
			effectiveness		homework		
			s		assignments and		
			questionnaire		goal		
			e				
Riley et al. (2019)	A pre-/post-pilot study finding evidence that mindfulness-based interventions and ACT programmes are suitable treatment approaches for female prisoners	the individual perspective of regular binge eating (6 participants at a baseline). Depression or anxiety (28) BPD (7) BAD (4) Schizophrenia (6)	-AAQ-II -DASS-21 -MAAS -PHQ-9/15/ED	N = 59 Age: 34.73 (9.98) Gender: 100% females BMI: not reported.	-Mindfulness of thoughts and feelings -defusing/mind watching	Ten sessions	Improvement in symptoms, decrease in depression scores and increase in Mindfulness and Acceptance. Mindfulness and acceptance-based approach is a valuable

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Smith et al. (2006)	A preliminary study exploring to what extent mindfulness interventions are feasible for reducing binge eating	Scores BES: Mild range of binge eating (7) Moderate range of binge eating (2) Severe range of binge eating (3)	-BES -BDI-II -MAAS -three-item measure from the scales of Psychological Well-Being -State Anxiety scale of the State-Trait Anxiety Inventory	N = 25 Age: 47.8 (13.1) Gender: 80% female BMI: 27.9 (7.4)	MBSR -breathing exercises -body scans -meditation -gentle Hatha yoga, -group discussion	8-week intervention with weekly three hours meetings. MBRS close to the standard manual, except that one mindful eating exercise was added each week. The course included several components like a	approach for female prisoners The intervention significantly reduced binge eating. A reduction in binge eating behaviour seems to be associated with an increase in self-acceptance.
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## MINDFULNESS BASED COGNITIVE THERAPY IN BINGE EATING DISORDER

workbook,  
home practice  
assignments,  
and CDs for  
practising at  
home

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*Note.* BES = Binge eating scale. BMI = Body Mass Index. SD = Standard Deviation. MBCT = Mindfulness-based cognitive therapy. MABCT = Mindfulness- action based cognitive therapy. MEAL = Mindful eating and living. WLC = Waiting list conditions. IC = Intervention condition. CARE = Compassionate Attention and Regulation of Eating Behaviour. MB-EAT = Meditation-based eating awareness training. MBSR = Mindfulness-based stress reduction. EDE = Eating Disorder examination. BES = Binge Eating Scale. BISS = Body Image shame scale. DASS21 = Depression, Anxiety and Stress Scale. CFQ-FC = Cognitive Fusion Questionnaire - Food Craving. BIAAQ = Body Image acceptance and action questionnaire. FFMQ = Five Facets Mindfulness Questionnaire. CAAS = Compassion Attributes and Action Scale. SCS = Self-compassion scale. FSCRS = Forms of self-criticism and self-reassurance scale. AAQ-II = Acceptance and action questionnaire. MAAS = Mindfulness Attention Awareness scale. PHQ = patient health questionnaire. BDI-II = Beck Depression Inventory. QEWP-R = Questionnaire pf Eating and weight patterns. BAI = Becks Anxiety Inventory. TFEQ = Three-factor eating Questionnaire. PFS = Power of Food Scale. ESES = Eating Self efficacy scales. RSE = Rosenberg Self-Esteem Inventory. EES = Emotional eating Scale. DERS = Difficulties in emotional regulation scale. SOCRATES = the stages of change readiness and treatment eagerness scale. EIE = Eating expectancy Inventory. KIMS = Kentucky Inventory of Mindfulness Skills. SCID-II Structured Clinical Interview for DSM-IV. ASI = Addiction severity Index. RCT = Randomised Controlled Trial.

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A total of ten studies met the inclusion criteria and was taken into the review (Table 3). All included studies used MBCT for the treatment of either clinical, sub-clinical, or mixed BED populations. To find the relevant studies, the titles and abstracts of the studies were carefully scanned for the inclusion criteria and either excluded or taken into further examination by the author. This review followed PRISMA guidelines for literature search (Moher et al., 2009). In total, 154 articles were screened and further assessed for eligibility. Sixty-one articles were excluded because of focusing on other third-wave therapies (e.g. DBT or ACT) or FEDs other than BED (e.g. AN or BN) (Figure 1). Two records were excluded because of not written in English.

### **Objectives of the Studies**

The ten studies had the general objective to examine the effectiveness of MBCT as a stand-alone therapy form for BED treatment. Therefore, mindfulness components like meditations, eating awareness exercises, body scans, or mini-meditations, which are concise meditations that can easily be integrated into daily life, were used in different forms of interventions to see which effect these have on the number and intensity of binge eating episodes and weight loss (Kristeller et al., 2006). Eight of the studies were pilot or preliminary studies with 10-60 participants. These described the effects of MBCT on BED by comparing pre-and post-intervention data of different measurement instruments. One was a case study, and one study was a complete and adequately powered RCT design with a sample of 150 participants. This RCT study also compared the effects of CBT to MBCT (Kristeller et al., 2014).

### **Samples and Diagnoses**

A total number of 338 participants was included in the ten studies. In total, 229 of the participants were receiving a MBCT intervention. They were aged from 23 to 78 years. Of the 338 individuals, 182 were diagnosed with BED, fulfilling all DSM 4 or 5 criteria. The remaining 156 participants either did not fulfil the frequency criteria (on average one time a week during the last three months) of the binge eating episodes or reported regularly bingeing on a personal level. Those were considered as sub-clinical samples. One study emphasised binge eating episodes in a group of individuals following bariatric surgery. In several studies also comorbidities were addressed. Comorbidities, for example, existed with depression, substance use disorder (SUD), anxiety, or borderline personality disorder (BPD).

## **Interventions**

### ***Target outcomes***

The target constructs of the studies varied between losing weight and minimising the BED symptoms. For example, the preliminary study of Smith et al. (2006) aimed to reduce binge-eating episodes but did not specifically focus on weight loss. In contrast to this, the intervention's emphasis in the pilot study of Dalen et al. (2010) was on losing weight and maintaining weight loss. This was also reported by the pilot study of Leahey et al. (2008). For studies that also aimed at weight loss, psychoeducation and other components were added to the mindfulness exercises and meditations. Moderate, slowly increased physical activity was encouraged (Dalen et al., 2010; Leahey et al., 2008). The pilot study of Riley et al. (2019) aimed at the general effectiveness of MBCT components on wellbeing and increasing mindfulness skills and did not explicitly focus on weight loss or reduce BED symptoms. Another pilot study by Courbasson et al. (2010) specifically developed a MBCT approach to address the comorbidity between BED and SUD. A case study by Kristeller et al. (2006), two pilot studies by Duarte et al. (2017) and Kristeller and Hallett (1999), and a RCT by Kristeller et al. (2014) emphasised reducing BED symptoms by targeting underlying constructs of the disorder like body shame or missing awareness as the most significant target construct.

### ***Targeted Underlying Mechanisms of Binge Eating Disorder***

The central underlying mechanisms that were addressed in the studies were raising awareness, releasing the feeling of loss of control, and increasing the levels of Mindfulness. Further, psychological flexibility, stress reduction, and compassion were addressed in the studies (Table 2).

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**Table 2.***Frequency of the targeted underlying mechanisms of BED*

The targeted underlying mechanism of BED	Study (author and date)
Raising awareness	Baer et al. (2005); Dalen et al. (2010); Kristeller et al. (2014); Kristeller et al. (2006); Kristeller and Hallett (1999)
Releasing the feeling of loss of control	Baer et al. (2005); Dalen et al. (2010); Kristeller et al. (2014); Kristeller et al. (2006); Kristeller and Hallett (1999); Leahey et al. (2008)
Increasing the levels of Mindfulness	Baer et al. (2005); Courbasson et al. (2010); Dalen et al. (2010); Duarte et al. (2017); Kristeller et al. (2014); Kristeller et al. (2006); Kristeller and Hallett (1999); Leahey et al. (2008); Riley et al. (2019); Smith et al. (2006)
Stress reduction	Kristeller et al. (2014); Smith et al. (2006)
Increasing Compassion	Duarte et al. (2017)
Psychological flexibility	Duarte et al. (2017); Riley et al. (2019)
Acceptance of body and shape	Courbasson et al. (2010); Duarte et al. (2017)

*Note.* BED = Binge Eating Disorder

Awareness can help participants notice inner sensations of hunger or satiety cues. This mechanism was specifically mentioned by five of the ten studies (Baer et al., 2005; Dalen et al., 2010; Kristeller et al., 2014; Kristeller et al., 2006; Kristeller & Hallett, 1999).

A component included by all ten studies was increasing the low level of Mindfulness. The meditations aimed to help the participants to be in the moment and to concentrate on their selves (Baer et al., 2005; Courbasson et al., 2010; Dalen et al., 2010; Duarte et al., 2017; Kristeller et al., 2014; Kristeller et al., 2006; Kristeller & Hallett, 1999; Riley et al., 2019; Smith et al., 2006).

The feelings of losing control were addressed in six of the ten studies and are seen as an essential contributor to maintaining the vicious cycle of BED (Baer et al., 2005; Dalen et al., 2010; Kristeller et al., 2014; Kristeller et al., 2006; Kristeller & Hallett, 1999; Leahey et al., 2008).



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Riley et al. (2019) and Duarte et al. (2017), who implemented ACT components and compassion in addition to the MBCT components, addressed the degree of psychological flexibility. Psychological flexibility means a wide range of abilities like being present in the moment and having a positive mindset. Research so far has shown that psychological flexibility is an essential contributor to a healthy mental wellbeing (Kashdan & Rottenberg, 2010).

Smith et al. (2006) and Kristeller et al. (2014), who based their intervention on the MBSR approach, addressed stress management as a central point. Stress reduction is also central in mindfulness training. The participants' triggers to emotional eating were addressed by including meditation techniques and teaching a meta-cognitive view on problems (Kristeller et al., 2014; Kristeller et al., 2006; Kristeller & Hallett, 1999; Leahey et al., 2008).

Duarte et al. (2017) also included the mechanism of the levels of self-compassion. It was assumed that a higher level of self-compassion would help participants better accept themselves as being independent from their weight and shape. Courbasson et al. (2010) and Duarte et al. (2017) also addressed this acceptance of body and shape as a mechanism.

### *Number of sessions*

The numbers of sessions included in the interventions varied between one to 16 sessions. The shortest intervention was by Duarte et al. (2017), who introduced a four-week intervention with one meeting of two and a half hours. This intervention aimed at using a low-intensity intervention to help participants with their BED symptoms. The most extended intervention was Courbasson et al. (2010), who administered a 16 session programme. Other interventions included 12 sessions by Kristeller et al. (2014), ten sessions by Baer et al. (2005), Leahey et al. (2008), and Riley et al. (2019), nine sessions by Kristeller et al. (2006), eight sessions by (Smith et al., 2006), seven sessions by Kristeller and Hallett (1999) and six sessions by Dalen et al. (2010). Overall, the duration of meetings ranged from 75 minutes to three hours.

### *Self-help vs Guided Group Therapy*

Nine of the ten studies were based on group therapies and guided by trained supervisors. The intervention sessions of Kristeller and Hallett (1999), Kristeller et al. (2006), and Kristeller et al. (2014) made use of a specific structure during the sessions. Each session started with a short period of reflection and discussion about last weeks obstacles and achievements. After that, a training part with mindfulness-related exercises was following. Another study by Duarte et al. (2017) designed a self-help intervention, including one

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psychoeducation session (information about dieting, nutrition and BED). Participants worked with a manual and audio tracks from a CD at home later on (Duarte et al., 2014).

### **Research Results**

Overall positive results in various categories like changes of symptoms specifically according to the disorder and with coexisting symptoms or long – and short-term effects could be identified. Weight change presented to be the most difficult outcome to achieve with the here present interventions.

#### ***Changes in Binge Eating Disorder specific Symptoms***

All studies found evidence for MBCT to be a promising and valuable treatment approach for BED (Baer et al., 2005; Courbasson et al., 2010; Dalen et al., 2010; Duarte et al., 2017; Kristeller et al., 2014; Kristeller et al., 2006; Kristeller & Hallett, 1999; Leahey et al., 2008; Riley et al., 2019; Smith et al., 2006). Kristeller et al. (2014), who compared the effectiveness of MBCT and CBT approaches, reported that 95% of the participants who followed the MB-EAT treatment did not fulfil the criteria for BED anymore at the end of the intervention and reduced their binge eating to a minimum. In contrast, only 76% of the CBT approach participants did not fulfil the BED criteria anymore. It has to be said that a slight improvement could be observed in the waiting list group of this study as well (Kristeller et al., 2014). The only partly negative outcome reported by Baer et al. (2005) was that subjective binges (self-perception of binge eating behaviour) increased after the intervention. This was explained by raising awareness of food, eating, and hunger sensations through the interventions. Furthermore, the participant's awareness of the amount of food they were eating was increased

#### ***Short-term and Long-term Data***

Four of the ten studies included in the review also added a follow up at different time points after the intervention (Dalen et al., 2010; Duarte et al., 2017; Kristeller et al., 2014; Kristeller & Hallett, 1999). Dalen et al. (2010) provided a six-week and three-month follow-up. Kristeller and Hallett (1999) checked upon the results after three weeks. Kristeller et al. (2014) provided data at one, four and six months follow up and Duarte et al. (2017) a one-month follow-up. The remaining six studies did not conduct follow-ups. As the follow-up data is still minimal, there is not much known about the actual long-term effects of MBCT on BED.

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Kristeller and Hallett (1999) found that half of the participants were free of symptoms at the end of the intervention. At the three-week follow-up, half of the participants reported one or fewer binges per week on average. Dalen et al. (2010) highlighted that reducing BED symptoms remained stable at six-week follow-up and three-month follow-up. In the study of Kristeller et al. (2014), the intervention effects were maintained at both follow-ups. Duarte et al. (2017) also found stable positive results for binge eating, depression, and stress symptoms at a one-month follow-up.

### *Improvements of Coexisting non-specific Symptoms*

Eight of the ten studies reported an improvement of the participants' scores of depressions (Baer et al., 2005; Courbasson et al., 2010; Duarte et al., 2017; Kristeller et al., 2014; Kristeller et al., 2006; Kristeller & Hallett, 1999; Leahey et al., 2008; Smith et al., 2006). The only exception that could be observed was by Baer et al. (2005), who reported that one participant's depression score increased, which was explained by the participant's circumstances. The reduction of depression directly responded to reducing BED symptoms (Smith et al., 2006). Smith et al. (2006) concluded that a mindfulness intervention might not directly need to focus on eating to decrease BED symptoms because of a transdiagnostic character of MBCT. Kristeller et al. (2014) rated the improvement as an independent reaction to the MBCT treatment. However, the view that the effects of BED cause depressive feelings is challenged by the hypothesis that the conditions of depression and BED are more disconnected from each other (Kristeller & Hallett, 1999).

Furthermore, Courbasson et al. (2010) found a significant improvement in alcohol and drug addiction in addition to the reduction of depression scores. They reported that the severity of symptoms decreased and rated MBCT as a practical approach for comorbidities like SUD and BED. In addition to the depression scores, two studies also reported that anxiety scores decreased (Dalen et al., 2010; Kristeller & Hallett, 1999).

### *Changes in Body Mass Index or Weight*

Surprisingly, the reduction in binge eating symptoms did not directly affect weight or BMI in many studies. For example, Leahey et al. (2008) reported that four of the seven group members did not lose the intended amount of weight. Smith et al. (2006) also reported that there was no weight loss after the intervention. In the case study of Kristeller et al. (2006), the participant only started losing weight after the treatment. In contrast to that, Kristeller et al. (2014) reported the highest weight loss in the group that received the mindfulness intervention. A more significant investment into a meditation practice was assumed to be

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related to more significant weight loss (Kristeller et al., 2014). In the study by Dalen et al. (2010), participants also lost weight, on average, four kilograms. What could be observed in the studies by Courbasson et al. (2010) and Duarte et al. (2017) was that participants could reduce their concerns about weight but not weight itself. In contrast, in the study of Baer et al. (2005), participants' weight concerns were slightly increased.

### *MBCT vs Psychoeducational Studies*

The only study that directly included a comparison between a MBCT approach and a CBT approach was performed by Kristeller et al. (2014). The superior decrease of binge eating symptoms in the MBCT group compared to the CBT group showed that the MBCT approach was more effective compared to CBT in this study.

### **Discussion**

This scoping review aimed to give a broad overview of the existing literature using a mindfulness-based approach to treat BED. Furthermore, the aim was to describe the different MBCT interventions used for the treatment of BED, including the MBCT components that are frequently included. The emphasis was placed on the targeted underlying mechanisms and advantages and disadvantages of MBCT for BED. The results found in this review suggest preliminary but promising evidence for MBCT being an effective treatment option for BED (Godfrey et al., 2015; Katterman et al., 2014; O'Reilly et al., 2014).

The three prominent targeted underlying mechanisms of BED in the studies were a lack of awareness, loss of control, and a low level of Mindfulness (Baer et al., 2005; Dalen et al., 2010; Kristeller et al., 2014; Kristeller et al., 2006; Kristeller & Hallett, 1999; Leahey et al., 2008; Riley et al., 2019; Smith et al., 2006). This is in line with O'Reilly et al. (2014), who mentions BED symptoms being a maladaptive coping mechanism to negative emotions. The lack of awareness causes an inability to sense feelings of being full. Loss of control was a significant mechanism also identified in previous research (Godfrey et al., 2015; Katterman et al., 2014; O'Reilly et al., 2014).

The theoretical basis for applying Mindfulness in BED was mainly the emotion dysregulation model with negative emotions as a trigger (Baer et al., 2005; Duarte et al., 2017; Kristeller et al., 2014; Smith et al., 2006). The more recent study of Duarte et al. (2017) defined negative emotions as too broad for causing BED symptoms. Instead, they found that the cause for triggers was low self-esteem levels, a negative body image and perception, and body shame. Individuals with BED displayed emotion dysregulation and a lack of coping

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mechanisms to manage unwanted emotions (O'Reilly et al., 2014). Binge eating was a short strategy to escape negative feelings. This explanation for BED from the perspective of MBCT contrasts the CBT view on BED. CBT explains BED by the restrained model. MBCT aims to expand the widely studied therapeutic approach of CBT by adding more awareness and unjudgemental acknowledgement of existing problems. The increase of awareness and the unjudgemental recognition of emotions and feelings in Mindfulness addressed the underlying mechanisms of the dysregulation model and, therefore, helped the participants stop the binge eating behaviour (Baer et al., 2005; Duarte et al., 2017; Kristeller et al., 2014; Smith et al., 2006). This is in line with previous research where also the emotion dysregulation model is rated as best explaining the underlying mechanisms of BED (O'Reilly et al., 2014).

The studies in this review showed that in most cases, a correlation between improved BED symptoms and other symptoms like depression, anxiety or SUD could be found. Nine of the ten studies found a change in depression scores. Only Dalen et al. (2010) did not include a measurement of depression in the study but concentrated on anxiety instead. Some studies considered this improvement of depression to be mediated by diminishing BED symptoms (Baer et al., 2005; Duarte et al., 2014; Kristeller et al., 2006; Kristeller & Hallett, 1999; Leahey et al., 2008; Smith et al., 2006). It is assumed that individuals are no longer affected by psychological distress and guilt because of binge eating and, therefore, experience improved depression scores. In contrast to this, Kristeller et al. (2014) rated the improvement of depression scores and BED symptoms independently. The approach of MBCT was considered valuable also for the treatment of depression. Still, a decrease in depression scores was not necessarily related to the diminishing of BED symptoms. This would make MBCT a more global treatment option that could decrease the burden of suffering from comorbidities as no need to attend different treatments would be necessary. Therefore, it was hypothesised that an MBCT intervention not necessarily has to focus on eating behaviour to affect BED symptoms. This is also in line with the results of O'Reilly et al. (2014) and Katterman et al. (2014), who also found evidence for MBCT interventions being effective for eating-related disorders but also for several other mental health concerns like depression or anxiety. This is an exciting hypothesis as it would make MBCT a transdiagnostic intervention approach for several mental health disorders.

Various active components like meditation, awareness training, or group discussions were integrated into the interventions to tackle the underlying mechanisms. An improvement in levels of awareness resulted in participants being better able to notice internal feelings like

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satiety cues or the feeling of being full (Baer et al., 2005; Kristeller et al., 2006). The awareness teaching techniques, like different kinds of body scans, helped the participants be fully aware of their whole body and feel their needs. This self-awareness strengthened the participants' ability to be unjudgemental, let thoughts come by and stay present at the moment (Baer et al., 2005; Kristeller et al., 2014; Kristeller et al., 2006). Not following the negative thoughts gave the participants a new feeling of control, which minimised their need to use binge eating as a maladaptive coping mechanism (Kristeller et al., 2006; Kristeller & Hallett, 1999; Leahey et al., 2008). Previously, the effectiveness of improving the situation of individuals with BED by addressing these underlying mechanisms has also been described by Kristeller and Wolever (2010). Interestingly the mechanism of raised awareness affected that participants tended to report a higher amount of subjective binges during a week. These binges were rated as binges by the participants subjectively but would not be rated as binge eating objectively (Baer et al., 2005). This shows that their awareness of portions and hunger sensation has increased. It was assumed that awareness of satiety cues is more important in reducing BED symptoms than the awareness of hunger. Kristeller and Hallett (1999) already described that the awareness of satiety cues leads to an improved feeling of control over the eating behaviour.

In line with the described targeted underlying mechanisms, the studies included in this review all integrated Mindfulness and awareness training techniques in their interventions (Baer et al., 2005; Courbasson et al., 2010; Dalen et al., 2010; Duarte et al., 2017; Kristeller et al., 2014; Kristeller et al., 2006; Kristeller & Hallett, 1999; Leahey et al., 2008; Riley et al., 2019; Smith et al., 2006). All of the ten studies found evidence that MBCT is an effective approach for the treatment of BED. Interestingly Kristeller et al. (2014), the only study that compared the effectiveness of an MBCT approach to a CBT approach which was considered the first-line therapy approach so far, found evidence for MBCT being more effective than CBT in the treatment of BED (Q da Luz et al., 2021). This is an exciting finding as it strengthens the hypothesis that MBCT could be an alternative treatment option for BED treatment. Furthermore, the studies that included a follow up showed that the positive results of MBCT treatment were in general stable up to four months follow up (Dalen et al., 2010; Duarte et al., 2017; Kristeller et al., 2014; Kristeller & Hallett, 1999). Compared to this, the more minor but positive effects in the CBT group diminished at four months follow-up.

It could, consistent with earlier research, be observed that it proved difficult to lose weight and decrease the BMI of the participants (Baer et al., 2005; Grilo et al., 2011;

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Kristeller et al., 2014; Kristeller et al., 2006; Kristeller & Hallett, 1999; Leahey et al., 2008; Smith et al., 2006). Although the binges per week decreased to a minimum, not all participants were able to lose weight. Five of the ten studies reported that weight loss was not the main aim of the research but was very important for the participants (Baer et al., 2005; Kristeller et al., 2014; Kristeller et al., 2006; Kristeller & Hallett, 1999; Smith et al., 2006). In the study by Baer et al. (2005), participants reported even a slight increase in weight concerns, which shows that participants might aim to change their weight, although this was not the central aim of the intervention. An increased concern of weight and body shape was seen as a reason for psychological distress and negative emotions that could trigger new binges. To prevent this, Katterman et al. (2014) already suggested including additional behavioural weight management techniques in the interventions. This is in line with the results found in this review, where participants were better able to lose weight when the intervention was, next to the binge eating, also focusing on the participants' lifestyle (Dalen et al., 2010; Leahey et al., 2008). In the interventions solely focusing on improving the BED situation less to no weight loss could be observed (Baer et al., 2005; Kristeller et al., 2014; Kristeller et al., 2006; Kristeller & Hallett, 1999; Smith et al., 2006).

One of the prominent advantages that became apparent in the studies was that also participants with sub-clinical symptoms (less than on average one binge eating episode per week) of BED seemed to profit from MBCT as a treatment option and could reduce their BED symptomatology (Baer et al., 2005; Kristeller et al., 2014; Riley et al., 2019; Smith et al., 2006). The results showed that participants who did not fully meet BED criteria according to the *DSM-5* profited from the MBCT approach. This is also in line with the previous research that found evidence for MBCT being effective for very different samples ranging from sub-clinical to clinical BED (Godfrey et al., 2015). Duarte et al. (2017) further showed that even a low-intensity self-help intervention could be valuable for sub-clinical samples.

Another advantage of MBCT is that the intervention is easily acceptable for different groups of participants. Differences in ethnicity and religion play only minor to no role in accepting these interventions (Kristeller et al., 2014). This advantage of Mindfulness being easily acceptable has been described by previous research (Fung et al., 2016).

### **Limitations**

There are several limitations formulated in the studies that need to be considered for further research. One is the limited number of studies included in the review. As research among MBCT for BED is still limited, only a small number of studies exists. Therefore, only

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a reduced selection could be integrated into this review. More research on the topic is needed to confirm the here found results.

Furthermore, the included studies were, except for one, all case-, pilot- or exploratory studies. Only Kristeller et al. (2014) conducted an RCT design that compared randomised groups getting different treatments. Especially the case study did not have any statistical power and needed to be confirmed by following studies. More of such RCT study designs are necessary to validate the results of MBCT being a practical approach for BED treatment.

Another limitation of this review is apparent in the methods for finding relevant literature. For the review only one researcher was scanning the literature without the control of others. To have a complete and throughout literature search, several researchers are needed to control for mistakes and have better results. Furthermore, only one search series was conducted. This could have the consequence that important literature is missing in this review.

### **Future Research**

Future research should focus on acquiring more knowledge to build a solid research basis for MBCT. It should be concentrated on conducting more RCT studies with larger sample sizes to validate the actual effectiveness of MBCT approaches compared to TAU. If more and larger-scale studies and samples could verify the found results, this means that MBCT is more or comparable to TAU effective in the short term treatment and more or comparable to TAU effective also in the long term to reduce binge-eating behaviour. As a similarly practical approach, MBCT could be an alternative for people who do not respond to other methods or prefer the MBCT approach. Furthermore, the transdiagnostic character of MBCT should be examined further to use the potential, that MBCT is possibly offering, fully. It is also essential that mindfulness-based interventions include lifestyle components focusing on weight loss into the interventions to help participants lose weight more effectively. Therefore, RCT studies must verify that MBCT is a valuable approach compared to manualised classical CBT approaches. Furthermore, bigger sample sizes are needed to confirm the significance of the findings.

### **Conclusion**

So far, MBCT is a promising approach for BED treatment of clinical and sub-clinical populations. Participants in the included studies of this scoping review significantly decreased their binges per week and raised their awareness of bodily states and sensations of emotions



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and feelings. Preliminarily, MBCT also produced superior outcomes compared to CBT and presented to be more effective for the treatment of BED than CBT in both the short- and long term. Inducing weight loss with MBCT as a stand-alone treatment approach was, comparable to CBT, difficult. The validity of the results of this review is still limited as more research is needed for solid results.

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