

Chapter 11 Summary

Eating disorders have a significant impact on the psychological, social and physical well-being and quality of life of affected patients (Agh et al., 2015; Hay et al., 2015; Rojo-Moreno et al., 2015). Of all eating disorders, Binge-Eating Disorder (BED) is the most recently acknowledged eating disorder and the most common eating disorders with an estimated life-time prevalence of 2%. Until 2013 BED was a provisional diagnosis and therefore not included in the Diagnostic and Statistical Manual of Mental Disorders. Still, BED remains underrecognized in comparison to anorexia nervosa and bulimia nervosa. This leads to undertreatment of BED in clinical practice. Furthermore, there is insufficient data about clinical characteristics and the clinical course of BED. Moreover, due to its recent acknowledgement, data regarding BED examining the etiology, prevalence, correlates, and response to treatment around the globe are scarce. Therefore, this dissertation focuses on various aspects of BED. Part I focuses on several knowledge gaps regarding assessment, prevalence, and correlates of BED, with a specific eye for Saudi Arabia. Focus of part II is treatment for BED: its effectiveness, efficacy, and cost-effectiveness. In short, two main subjects are addressed in this dissertation: assessment and correlates (part I), and treatment (part II).

Though data regarding efficacy and cost-effectiveness of treatments for BED are scarce in the western world, etiology, prevalence, and correlates are unknown for most Arab countries, such as Saudi Arabia. This may be because traditional Arab notions of beauty differ from the western ideal, with a curvy body being associated with fertility and wealth. However, since the oil boom a rise of the thin ideal occurred, and there are indications that eating disorders are prevalent in the Arab world. However, since eating disorders are not perceived as disorders of primary care, Saudi Arabia faces an absence of assessment tools and specialized treatment centers. In addition, research regarding eating disorders in Saudi Arabia is further

complicated by Saudi dealing with several taboos and stigma regarding mental health problems.

Assessment

Absence of assessment tools to measure body-shape dissatisfaction and eating disorder pathology may lead to overlooking or underdiagnosing BED and other eating disorders, which hampers timely proper treatment. Consequently, reliable and valid assessment tools adapted to the language and culture at hand facilitates detection of individuals at high risk of eating disorders and body-shape dissatisfaction. The Body Shape Questionnaire (BSQ; Cooper et al., 1987) is most often used to measure body-shape dissatisfaction and the Eating Disorder Examination- Questionnaire (EDE-Q; Fairburn & Beglin, 1994) is the most widely used self-report measure for eating disorder pathology. Both self-report measures are translated and adapted to various cultures. The BSQ and EDE-Q are currently not available in an Arabic version adapted for use in Saudi Arabia.. Due to cultural differences self-report instruments need adaptations, and norms for Western and Arabic populations may differ. Therefore, the present thesis aims to adapt the BSQ and EDE-Q to the Saudi language and culture and evaluate its psychometric properties.

Correlates

The Saudi culture is currently undergoing rapid changes. Previous research shows that countries dealing with such rapid changes are impacted by an increase in eating disorder prevalence (Gordon, 2001; Pavlova et al., 2010). Various explanations have been put forth. Sociocultural changes come along with a more sedentary lifestyle, and a dietary shift towards western types of foods, instrumental in the rise of excess weight. Excess weight appears to be

associated with body-shape dissatisfaction, which increases the risk for unhealthy dietary habits, which in turn increases the risk of developing eating disorder pathology.

Westernization, another consequence of the sociocultural changes in Saudi Arabia, is associated with eating disorder pathology as well, as it led to a rise in the popularity of the “thin ideal”. Consequently, levels of dieting, body-shape dissatisfaction and eating disorder pathology increased. Identification of correlates of eating disorder pathology, and the co-varying role of high BMI may facilitate the identification of individuals at risk for developing an eating disorder. These individuals at risk may benefit from participation in prevention programs (Stice et al., 2010).

Treatment

Enhanced Cognitive Behavioral Therapy (CBT-E; Fairburn, 2008) is an effective treatment among transdiagnostic samples and for adult patients suffering from bulimia nervosa and atypical anorexia nervosa. However, data are scarce on how adult patients diagnosed with BED respond to CBT-E. In addition, efficacy of CBT-E is mostly examined in randomized controlled trials, while effectiveness studies involve a naturalistic design and measure the degree of beneficial effect in real world, clinical settings. Therefore, the effectiveness of CBT-E among patients suffering from BED is investigated in this thesis and compared to other eating disorders. Furthermore, determination of factors predicting CBT-E treatment outcome provide prognostic information about for whom CBT-E is likely to be beneficial and for whom less so. Treatment outcomes can potentially be maximized by understanding its predictors as more targeted treatments can be offered and potentially additions can be developed, thus improving clinical decision making (Kraemer, 2013).

CBT-E is effective, but provided in the traditional face-to-face manner it is a time consuming treatment, requesting intense therapist involvement. In order to offer more

efficient treatments, an eMental Health intervention of CBT-E accompanied by 12 brief telephone sessions (guided self-help CBT-E) might be a solution, as this potentially covers the present gap between treatment needs and provision. Guided self-help CBT-E has also several additional advantages for the patient. As a first step to evaluate this treatment modality for BED, its efficacy is examined in a randomized controlled trial (RCT) by comparing outcomes of an experimental treatment group to a delayed treatment control group.

Guided self-help CBT-E is briefer than in-person CBT-E, requires less therapist involvement, and therefore potentially associated with lower costs of providing treatment. Furthermore, guided self-help CBT-E potentially decreases societal burdens (Weissman, 2017), since BED is associated with non communicable diseases such as hypertension and diabetes mellitus and decreased work place productivity. Therefore, an economic evaluation is undertaken from a societal perspective, alongside the RCT.

Part I Assessment, etiology, and correlates of eating disorder pathology

Main findings

Assessment

Psychometric characteristics of the Saudi version of the EDE-Q (chapter **two**) were satisfactory and the results supported the discriminant and convergent validity as compared to a golden standard, the eating disorder examination (EDE), a semi-structured diagnostic interview. The receiver-operating-characteristic curve analysis showed that the EDE-Q could accurately discriminate between individuals at high and low risk for an eating disorder according to the EDE. The original four factor model of the EDE-Q was not supported, but severity level of eating disorder pathology was accurately determined by the EDE-Q global score. The proposed cut off was 2.93.

The full version of the BSQ (BSQ34) and the short version (BSQ8C) discriminated well between clinical and non-clinical levels of body-shape dissatisfaction according to the eating disorder examination- shape concern subscale (chapter **three**). Both Saudi-Arabic BSQs had high internal consistency and a unidimensional factor structure. Suggested optimal cut-off for the BSQ34 was 114. The Saudi- Arabic EDE-Q and BSQ can be used to identify Saudis at risk for eating disorders in order to offer preventative programs.

Etiology

The review presented in **chapter four** showed that rates of eating disorder pathology were higher among women (11.4- 54.8%) than men (2- 47.3%) on eating disorder screening instruments. From our own findings presented in **chapter two**, it was estimated that according to the Saudi-Arabic EDE-Q, 28,8% ($n = 775$) of the sample was at high risk for an eating disorder. Since participants in this study were not consistent in their symptom presentation between the EDE and EDE-Q, data were insufficient to examine the exact prevalence of the various eating disorder symptoms. However it was most likely that binge- eating was the most common eating disorder symptom. The majority of the Saudi participants reported excess weight and BED was associated with high BMI. The conclusion that BED was the most common eating disorder in Saudi Arabia was supported by the recently conducted Saudi National Health Survey (AlHadi et al., 2022). This study reported a 12-months eating disorder prevalence of 3.2% and a life-time prevalence of 6.1%. BED was the most common eating disorder with a 12-months prevalence of 2.1% and a life-time prevalence of 2.6% (AlHadi et al., 2022). The review presented in chapter **four** established a gender difference, while our data (reported on in chapter **two** and **three**) showed that there were no differences in eating disorder pathology between both genders, a finding in line with AlHadi., et al (2022).

Chapter **three** investigated the prevalence of body-shape dissatisfaction in a Saudi convenience community sample, mainly existing of highly educated young women. According to the Saudi- Arabic BSQ 26.7% ($n = 231$) of them appeared at risk for body-shape dissatisfaction. However, the systematic review (chapter **four**) showed that on the Stunkard's body silhouettes test (Stunkard et al., 1983), around 66% of the Saudis displayed body-shape dissatisfaction. Chapter three did not find differences in body-shape dissatisfaction between women and men, while studies included in the review in chapter four found that women were more at risk for body-shape dissatisfaction than men. The substantial difference in body-shape dissatisfaction may be explained by the use of different measures. In addition, the studies included in the review did not use the culturally appropriate norms and the screeners used were not culturally adapted. This might have impacted the reported estimate rates and gender differences.

Correlates

Last, chapter **four** and **five** investigated correlates of eating disorder pathology. Body shape-dissatisfaction and high BMI were correlates of eating disorder pathology. A higher BMI was also associated with greater levels of body-shape dissatisfaction. Currently Saudi Arabia has the highest prevalence of excess weight worldwide (WHO, 2006), which makes this a relevant finding. High BMI appeared a covariate in the association between body-shape dissatisfaction and eating disorder pathology among Saudis. The high rates of eating disorder pathology and body-shape dissatisfaction may be a reflection of the high rates of excess weight and the attempts to lose weight among the Saudi society. **Chapter five** also showed that unmarried Saudis reported more eating disorder pathology than married Saudis which is in line with (AlHadi et al., 2022). In univariate analyses eating disorder pathology and media use

were weakly associated and socio-economic status was moderately associated with eating disorder pathology. Next, a multivariate regression analysis was performed. Low self-esteem, western cultural orientation rather than Arab orientation, increased levels of stress, frequency of media use, and high socio-economic status were no longer associated with eating disorder pathology.

Limitations and strengths of the studies

The most significant limitation was that the findings in chapter four were based on measures that were not validated for use in Arabic countries. This might have impacted the prevalence rates and estimated symptom severity. In addition, the samples in chapter two, three and five were biased. The Saudi convenience community samples included mainly young, highly educated women. Other factors also might have caused selection bias: participants might have had special interest in health care, mental health care or eating disorders, which motivated them to take part in the survey. The self-report data might also have been biased. The collectivistic culture of the Arab world made people hesitant to report individual desires, which might have impacted the reported eating disorder pathology. However, gender, age and level of education did not affect eating disorder pathology and the EDE-Q and BSQ performed similarly among both genders and various age groups. In addition, chapter two describes the efforts to counteract the potential effect of selection bias by propensity weighting. Due to the cross-sectional nature of part I it was impossible to examine causal relationships. The psychometric properties of the EDE-Q and BSQ were not assessed in a clinical sample and test-retest reliability nor sensitivity to change were assessed.

Strengths were the large sample sizes, data were collected in a society with a taboo on mental health care and a lack of popular knowledge regarding eating disorders. The studies were sufficiently powered. This was the first study to examine eating disorder pathology by

the use of validated assessment tools and some studies were supplemented by interview data. The studies included could be perceived as a first step to expanding knowledge regarding the understudied Saudi population examining assessment, etiology and correlates of eating disorder pathology.

Clinical implications

The proposed cut-offs of the EDE-Q and BSQ can be used to select Saudis for programs aiming to avoid development of eating disorder pathology and to measure reduction of eating disorder symptoms after eating disorder treatment, and therefore to assess efficacy and effectiveness of the various eating disorder treatments across the globe. In addition, life style interventions counteracting the elevated prevalence of excess weight in order to prevent associated health risks, accompanied by psycho-education in order to prevent maladaptive weight-loss strategies, may be beneficial. Treatment is hampered by the lack of specialized therapists and treatment facilities, as well as the lack of popular knowledge about eating disorders which has lead to stigmatization, and delayed help seeking. It is necessary to increase awareness on eating disorders in the Saudi community. This could be achieved by offering psycho-education at high-schools, including a parental program. Furthermore, eating disorders should become a disorder of primary care in Saudi Arabia and therapists should be trained in treatment of eating disorders.

Future studies

It is recommended for future studies to examine test-retest reliability and sensitivity to change of the Saudi-Arabic EDE-Q and BSQ in a clinical sample. In order to increase generalizability such samples should be more balanced with regard to age, gender and level of education. In addition, in order to draw causal relationships between risk factors for eating

disorder pathology future studies should involve longitudinal data. Such studies could potentially estimate whether high BMI and body-shape dissatisfaction caused eating disorder pathology or are a result of such pathology.

Part II Treatment

Main findings

Chapter **six** showed that in-person CBT-E is an effective treatment among adult patients diagnosed with BED outside the confines of an RCT. At the end of treatment, 48% showed abstinence from binges, and 65% had an EDE-Q score below clinical cut-off. Full recovery (abstinence from binges combined with an EDE-Q score below clinical cut-off) was achieved by 37%. Effect sizes of reduction in EDE-Q score were large. Furthermore, and consistent with the transdiagnostic nature of CBT-E, the naturalistic study showed that treatment outcomes among patients diagnosed with BED, bulimia nervosa, their respective OSFEDs and atypical anorexia nervosa were similar. Furthermore, chapter **six** added to the scarce body of knowledge on treatment outcome predictors of in-person CBT-E, and predictors of early treatment termination (drop-out). Drop-out from treatment was only predicted by the diagnosis of bulimia nervosa (a higher drop out among these patients). Higher level of education predicted better treatment outcome at the end of treatment and men had better treatment outcomes compared to women at follow-up. In line with several other studies which examined predictors of in-person CBT-E (Masheb & Grilo, 2008; Vall & Wade, 2015) or in-person CBT for BED (Lammers et al., 2015; Peterson et al., 2000), severity of the eating disorder at start predicted a higher level of pathology for all eating disorders at the end of treatment and follow-up. An exception was that for BED patients eating disorder severity at the start did not predict severity at follow-up. This indicated that 20

weeks after conclusion of in-person CBT-E BED patients with a severe eating disorder had greater reduction of eating disorder pathology than patients with less severe eating disorders.

Next, a treatment variant which requires less therapist time: online guided self-help CBT-E was evaluated. Such a less intense form of CBT-E treatment might bring about several other potential benefits for patients and therapists, such as bridging the present gap between treatment needs and treatment provision, the removal of geographical barriers, reduced travel costs and travel time. In chapter **seven** and **eight** the efficacy of this guided self-help version of CBT-E was evaluated by comparing it in an RCT with a delayed treatment control group. Guided self-help CBT-E appeared superior to waiting for treatment at end of treatment. In the guided self-help condition 40% of the participants showed full recovery, abstinence from binge eating was reported by 48% and eating disorder pathology score was below clinical cut-off for 63% on interview data and 79% on self-report data. In the waitlist group 10% showed abstinence from binges and 12% an EDE score below clinical cut-off. Follow-up data revealed that there were no longer differences in number of binges and severity of eating disorders pathology between groups after both conditions had received treatment.

Chapter **nine** examined whether guided self-help CBT-E was a reasonable investment for the Dutch health care system. An economic evaluation of guided self-help CBT-E compared to waiting for treatment over a period of three months, the initial phase of the RCT was performed. The economic evaluation showed that guided self-help CBT-E led greater QALY gain. The difference in societal costs between both conditions was approximately €641 [CI -86-1,393]. Costs of one QALY gained were €32,515 [CI -4619-151,393], and approximately €17 [CI -2-40] per incremental binge prevented. Guided self-help CBT-E can be seen as a reasonable investment for the Dutch health care system as costs of one QALY gain are within the NICE willingness-to-pay threshold of €35,000 per QALY (NICE, 2023). There were no differences in costs between the two conditions, except for outpatient mental

healthcare costs, associated with the guided self-help CBT-E intervention provided to the experimental group. The results remained stable in the sensitivity analyses, supporting the robustness of the findings. Findings of current study are in line with the few other studies reported on in the literature, which indicated that guided self-help interventions for binge eating are cost-effective (König et al., 2018; Lynch et al., 2010).

Limitations and strengths of the studies

A limitation of the studies included in part II was the time horizon. Longer follow-up data than 20-weeks could also assess if long-term recovery was achieved after in-person CBT-E as presented in chapter six. Chapter eight and nine showed efficacy and cost-effectiveness over a three months time horizon. Patients in the control condition received guided self-help CBT-E during follow-up. Therefore, comparison of efficacy, cost-effectiveness and cost-utility was not possible after three months. This precluded evaluation of long-term effectiveness as well as the costs of guided self-help CBT-E as compared to no treatment. The use of a waiting list control group was also a limitation. The use of an active comparator would have enabled examination of efficacy and an economic evaluation of guided self-help CBT-E with a longer time horizon. Part II also partly relied on self-report, while EDE interview data are generally more reliable, especially when measuring binges. The use of self-report data might also have affected recall bias. This effect was counterbalanced by extrapolation of last month's data over three months. Next, the use of a CBT-E adherence checklist, or adherence assessment by an independent rater would have yielded more valid information regarding treatment integrity. Last, all studies were biased for gender. Though 10-35% of the patients with eating disorders are men, only 5-10% of the included patients in chapters 6-8 were men.

Strength of all studies was that all therapists received at least weekly supervision sessions. All studies were adequately powered. Multiple imputations were performed to handle missing data. Internationally used valid self-report and interview instruments were administered. The Covid-19 pandemic had limited impact on the study's execution, due to the treatment delivery mode (eMental Health) of guided self-help CBT-E. Last, this dissertation was the first to examine efficacy and cost-effectiveness of guided self-help CBT-E only including full-syndrome BED patients.

Clinical implications

The Dutch guidelines recommend CBT-E. With regard to personalized medicine, especially men, highly educated patients and patients with severe BED benefit well from in-person CBT-E. Therefore, in-person CBT-E should be the treatment of choice for men and highly educated patients with bulimia nervosa, and atypical anorexia nervosa. Since the diagnosis of bulimia nervosa predicts treatment dropout, the motivational phase of the CBT-E underweight could be considered when patients show low levels of motivation for treatment at the start. In addition, in concordance with the stepped care principle and international guidelines guided self-help CBT-E could be the first treatment of choice for patients with BED. Moreover, guided self-help CBT-E will enhance access to treatment over the globe when adapted to various socio-cultural contexts and offered among other cultures. Thus, guided self-help CBT-E could be a resolution in Saudi Arabia to deal with the great distances, the lack of specialized treatment centers and therapists. Several studies have shown that outcomes of remotely offered psychotherapy, including CBT-E, are on par with in-person offered psychotherapy, either at end-of-treatment or at follow-up. Even when remotely offered treatment was not accepted by patients, treatment outcomes were positive (Linardon, 2022). Another advantage from guided self-help CBT-E over traditional in-person therapy is

that patients are more likely to attribute the results of treatment to their own efforts rather than the help of therapists. This in turn will enhance their sense of self-efficacy, confidence and motivation to complete treatment. These examples show that guided self-help CBT-E can have a positive effect on eating disorders around the globe.

Future studies

A logical next step is to compare the effectiveness and cost-effectiveness of guided self-help CBT-E with in-person CBT-E in an RCT. Furthermore, future studies are recommended to assess recovery beyond 24 weeks after the end of treatment. This will enable evaluation of efficacy and cost-effectiveness over a longer timeline and further enhance decision making as scarce resources can be allocated where they offer best value for money (Konnopka et al., 2009; Stuhldreher et al., 2012). More importantly, it is also recommended to examine the efficacy of guided self-help CBT-E through video conferencing instead of by telephone as patients can see their appearance and body on the screen during treatment. This potentially is an intervention on its own as it enhances body and weight acceptance and tolerance, and consequently changes the evaluation of body and weight to some extent (Murphy et al., 2020).

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