

A Study on the Association Between Metacognition About Desire Thinking, Eating Beliefs, and Craving Among Indian Women with Binge-Eating Behavior

Navneethkrishna A Unmesh

MSc Clinical Psychology, Christ University

Abstract

Binge-eating disorder (BED) represents a complex condition characterized by recurrent episodes of uncontrolled overeating, leading to significant distress and health consequences. This study aims to investigate the intricate interplay between metacognition, desire thinking, eating beliefs, and craving among Indian women with binge-eating behavior. Drawing upon the Metacognitive Model of Eating, we explore how metacognition relates to desire thinking and craving and whether it acts as an independent predictor of binge-eating severity in this population. The study's findings hold potential implications for the development of metacognitive interventions tailored to treat BED in the context of Indian culture. By delving into these cognitive facets, this research strives to enhance our understanding of the cognitive underpinnings of BED among Indian women and inform more effective treatment strategies.

Keywords: metacognition, binge-eating, desire thinking, craving, eating-beliefs.

Introduction

Binge-eating disorder (BED) is a complex and debilitating eating disorder characterized by recurrent episodes of consuming large quantities of food, often accompanied by a feeling of loss of control. BED has significant physical, psychological, and social implications for those affected. While it is recognized as a distinct psychiatric disorder, the underlying cognitive processes and their relationship with binge eating in specific cultural contexts, such as among Indian women, remain areas of active research.

Eating beliefs encompass a broad spectrum of cognitive constructs, including perceptions of hunger and fullness, the moralization of food, ideas about body image, and the regulation of eating behaviors. Such beliefs are heavily influenced by cultural, familial, and societal factors, making them a complex subject of study within the realm of clinical psychology and nutrition science. Moreover, as research continues to expand, it is evident that the role of eating beliefs extends beyond individual behaviors and may have implications for public health and policy.

Research has shown that metacognition, or thinking about thinking, plays a crucial role in various psychopathological conditions, including eating disorders. Metacognitive beliefs encompass an individual's thoughts about their thoughts, particularly as they relate to their eating behaviors, cravings, and desires. The role of metacognition in eating disorders, specifically BED, is a relatively recent area of exploration within the field of clinical psychology.

Desire thinking, a key aspect of metacognition, involves a persistent focus on the desired object, such as food, and often leads to an uncontrollable urge to satisfy that desire. Individuals with BED may experience heightened desire thinking related to specific foods, triggering intense cravings, and ultimately resulting in binge eating.

Furthermore, the concept of metacognition about desire thinking (MDT) in the context of BED remains an understudied area, particularly among Indian women. MDT pertains to the metacognitive beliefs about the experience of desire thinking and its perceived uncontrollability. Understanding how MDT influences the severity of binge eating among Indian women can provide valuable insights into the etiological and maintenance factors specific to this population.

Theoretical Perspectives

The Cognitive-Behavioral Model of BED suggests that metacognition, desire thinking, and craving play integral roles in the development and maintenance of binge-eating behaviors. This model posits that individuals with BED may hold specific metacognitive beliefs about their desires and thoughts related to food, which can contribute to the experience of intense cravings and ultimately lead to binge eating.

Metacognitive beliefs about desire thinking can include thoughts about a lack of control over eating urges, rumination on the desire for specific foods, and beliefs related to the uncontrollability of thoughts and desires. These metacognitive factors interact with eating beliefs, such as beliefs about loss of control during eating and emotional coping through eating, which further exacerbate binge-eating tendencies.

The Cognitive-Behavioral Model of BED also emphasizes the role of cognitive restructuring and behavioral interventions in the treatment of binge-eating behaviors. Interventions often aim to identify and modify maladaptive metacognitive beliefs and thought patterns, thereby reducing cravings and preventing binge eating. This aligns with the research paper's objective of exploring metacognition, desire thinking, and craving among Indian women with binge-eating behavior and highlights the potential relevance of metacognitive interventions.

Rationale & Significance of the Study

Binge-eating disorder (BED) is a prevalent eating disorder with a variety of harmful health and psychological repercussions. Despite the high prevalence of BED, effective treatment options for this disorder remain limited, and many individuals with BED continue to experience significant symptoms and impairments. Research has suggested that metacognition about desire thinking, eating beliefs, and craving may be important psychological processes that contribute to the development and maintenance of BED (Hudson et al., 2007). Several studies have provided evidence for the relevance of these psychological processes in the context of BED. A study conducted by Kessler et al. (2013) found that metacognitive beliefs were significantly associated with the severity of BED symptoms, and suggested that interventions targeting these beliefs may be effective in reducing binge-eating behavior. Additionally, a study by Mason et al. (2017) found that desire thinking was significantly associated with binge-eating behavior among a sample of American adults with BED.

Given the limited research on the relationship between metacognition, desire thinking, and craving among Indian women with BED, there is a need for further investigation in this area. This study is significant as it may provide insights into the psychological processes that contribute to the development and maintenance of BED in this population, and may inform the development of culturally appropriate interventions for individuals with BED in India

Statement of the problem

Binge-eating disorder is a significant health concern among Indian women, with prevalence rates estimated to be as high as 2.6% (Bhattacharya et al., 2016). The disorder is characterized by recurrent episodes of excessive food consumption, accompanied by a sense of lack of control over eating behavior. Metacognition, desire thinking, and craving is important psychological constructs that have been linked to binge-eating disorder. Metacognition refers to the awareness and regulation of one's thinking processes, while desire thinking refers to the tendency to fantasize about the desired outcome of behavior, and craving refers to the strong urge or desire to engage in a particular behavior.

Despite the relevance of these constructs, the relationship between metacognition about desire thinking, and craving in Indian women with binge eating has received limited attention. Therefore, this study aims to explore the relationship between metacognition, desire thinking, and craving among Indian women who binge eat. Specifically, the study will investigate how metacognition relates to desire thinking and craving, and how these constructs jointly predict binge-eating behavior in this population. The findings of this study will have implications for the development of targeted interventions for binge-eating disorders in Indian women.

Objectives/ Hypotheses of the current study

The main objective of this study is to investigate the relationship between metacognition about desire thinking, eating beliefs, and craving among Indian women who binge eat. Specifically, the study aims to examine how metacognition about desire thinking relates to eating beliefs, and craving in Indian women with binge eating and determine whether metacognition about desire thinking is an independent predictor of the severity of binge eating in this population. The study aims to identify if there are significant differences in the relationship between metacognition, desire thinking, and craving among Indian women with varying levels of binge eating. The study would provide insights into the potential role of metacognitive interventions in the treatment of binge-eating disorder among Indian women. This study aims to answer the following research questions:

- Is metacognition about desire thinking an independent predictor of the severity of binge eating among Indian women?
- Does the relationship between metacognition about desire thinking, eating beliefs, and craving differ significantly among Indian women with varying levels of binge eating?

The following hypothesis has been formulated for the research study:

- Metacognition about desire thinking and EBQ are independent predictors of the severity of binge eating among Indian women.
- Metacognition about desire thinking, eating beliefs, and craving have significant relationships among Indian women with binge-eating behavior.

Review of Literature

The investigation into the relationship between metacognition, desire thinking, and craving among individuals with binge-eating behavior is situated within the broader context of eating disorders, cognitive processes, and their impact on mental health and well-being. This comprehensive review of the literature aims to provide a deeper understanding of these constructs, focusing on their relevance to binge-eating disorder (BED) and the specific cultural context of Indian women.

Eating Beliefs and Their Role in Eating Behaviors

Eating beliefs are influenced by cultural, familial, and societal factors and play a crucial role in the development and maintenance of eating disorders (Fairburn & Harrison, 2003). Research has shown that individuals with BED often exhibit specific eating beliefs that contribute to their disordered eating behaviors (Goldfein, Walsh, LaChausse, Kissileff, & Devlin, 2010). For example, they may hold beliefs about the moralization of food, associating certain foods with guilt or reward (Adams, Handley, Manley, & Dowson, 2011). Such beliefs can lead to a cycle of binge eating followed by feelings of shame and guilt, reinforcing the disorder (Fairburn & Harrison, 2003).

Metacognition and Eating Disorders

The Metacognitive Model of Eating Pathology (MMEP) posits that individuals with eating disorders engage in metacognitive processes that amplify the perceived need for restrictive eating and create cycles of uncontrolled eating (Wells, 2000). Metacognition is linked to a range of cognitive processes, including rumination, threat monitoring, and thought suppression, which can exacerbate the symptoms of BED (Cooper, Todd, & Woolrich, 2016). The rumination about food and eating may increase the desire to eat and subsequently lead to binge eating (Eiber, 2016). Thus, understanding metacognitive processes is crucial in unraveling the complexities of BED and the development of effective interventions (Razavi & Ray, 2021). A study by Castellini et al. (2016) found that metacognitive beliefs and processes were associated with the severity of binge-eating symptoms among a sample of Italian adults. The authors suggested that interventions targeting metacognitive processes may be effective in reducing binge-eating symptoms. Giel et al. (2017) investigated the relationship between metacognitive beliefs, binge-eating behavior, and body mass index (BMI) in a sample of German women with binge-eating disorder. The authors found that metacognitive beliefs were significantly associated with binge-eating behavior and BMI, and suggested that targeting metacognitive beliefs may be a useful intervention strategy for this population.

Desire Thinking and Craving

In the realm of binge eating, desire thinking may involve recurrent thoughts about specific foods or eating episodes (Spada, 2010). Research has shown that individuals with eating disorders, including BED, experience a heightened desire to think about food (Meule, 2019). These persistent thoughts may intensify cravings and lead to binge-eating episodes (Kemps, Tiggemann, Hollitt, & Spillane, 2014). Craving, often defined as an intense desire to consume a specific food, is a common component of BED (Meule, 2019). It is associated with a loss of control over eating, reinforcing the cycle of binge eating (Brewer et al., 2011). Similarly, a study by Lantz et al. (2017) examined the relationship between desire thinking and binge eating among a sample of Swedish women. The authors found that desire thinking was positively associated with binge-eating frequency and severity, and suggested that interventions targeting desire thinking may be effective in reducing binge-eating behaviors.

Cravings can also trigger metacognitive processes, such as rumination about food, further exacerbating binge-eating behavior (Cooper et al., 2016). Craving has also been found to be a significant predictor of binge-eating behavior. A study by Murphy et al. (2018) examined the relationship between craving, impulsivity, and binge-eating behavior among a sample of Australian adults. The authors found that craving was a significant predictor of binge-eating behavior, even after controlling for impulsivity.

The Cultural Context: Indian Women and Binge Eating

This study focuses on Indian women, acknowledging that eating behaviors and the development of BED are influenced by cultural factors. Studies have shown that Indian women may experience unique societal

pressures and expectations related to body image and eating habits (Verma & Krishnan, 2019). These cultural factors can contribute to the development of specific eating beliefs, metacognitive processes, and desires regarding food. The existing literature provides evidence for the relevance of metacognition, desire thinking, and craving in the context of binge-eating disorder. However, more research is needed to investigate the specific mechanisms underlying these relationships and to develop effective interventions that target these psychological processes. The study by Bhattacharya et al. (2021) has contributed considerably to future research in this area.

Method

Research Design

A cross-sectional research design will be adopted for this study. This would involve recruiting a sample of Indian women with binge-eating disorders and a control group of Indian women without any eating disorders. The main advantage of a cross-sectional design is that it allows for the examination of the relationship between the variables of interest (metacognition, desire thinking, and craving) at a single point in time, which can provide important insights into the possible associations between these variables.

Sample

One hundred and twenty-four female participants would be recruited for the study using purposive sampling. Purposive sampling is employed in this study to ensure that the sample of participants with binge-eating disorder is representative of the population of Indian women with binge-eating disorder. The researcher would employ purposive sampling to select participants with binge-eating disorder who have varying levels of severity of the disorder. This would allow the researcher to examine the relationship between metacognition, desire thinking, and craving among Indian women with binge-eating disorders across a range of severity levels.

Inclusion criteria

- Female participants aged 18-35 years old.
- Participants who self-identify as Indian.
- Participants who are fluent in English.

Exclusion criteria

- Participants who have a history of any neurological or psychiatric disorders other than eating disorders.
- Participants who have a history of substance abuse or dependence.
- Participants who are currently undergoing treatment for binge-eating disorder or any other eating disorder.
- Participants who are unable to provide informed consent.
- Participants who are pregnant or breastfeeding.

Procedure

The researcher would recruit Indian women aged 18 years and above who meet the inclusion criteria for the study. A written informed consent form would be collected from all the participants prior to their participation in the study. The researcher would collect basic demographic information from each participant, including age, gender, education, and occupation. The administration of the Binge-eating Scale, Food Craving Inventory, Metacognition about Desire Thinking Scale, and Eating Beliefs Questionnaire to each participant would be carried out electronically via google forms. These

questionnaires would be administered in a fixed order to all participants. The data collected would be analyzed using statistical software to examine the relationships between metacognition, desire thinking, and craving among Indian women with binge-eating disorder.

Tools used

Binge Eating Scale (BES; Gormally, Black, Daston & Rardin, 1982) is a self-report questionnaire designed to measure the severity of binge eating symptoms. It consists of 16 items, with each item rated on a four-point scale ranging from 0 (no binge eating) to 3 (severe binge eating). The scale is scored on a range of 0-46, with higher scores indicating more severe binge eating. The BES has three categories of scores: 0-16 indicates non-bingeing, 17-26 indicates moderate bingeing and 27 or higher indicates severe bingeing. (Gormally, Black, Daston & Rardin, 1982). A study by Gormally et al. (1982) assessed the validity and reliability of the BES in a sample of 28 obese patients seeking treatment for weight loss. The study found that the BES had high internal consistency (Cronbach's alpha = 0.96) and good test-retest reliability ($r = 0.89$). The study also found that the BES was able to discriminate between individuals with and without binge eating disorder.

The Metacognitions about Desire Thinking Questionnaire (MDTQ) is a self-report measure designed to assess metacognitive beliefs and processes related to desire thinking, defined as a repetitive and persistent mental activity focused on desires and craving (Spada, Caselli, & Wells, 2009). Research evidence suggests that the MDTQ is a valid and reliable measure of metacognition about desire thinking. For instance, a study conducted with a sample of alcohol-dependent patients found that the MDTQ scores were significantly associated with craving severity, alcohol use, and treatment outcomes (Spada, Nikčević, Moneta, & Wells, 2008). The psychometric properties of the MDTQ have been examined in several studies. In one study, the MDTQ showed high internal consistency (Cronbach's alpha = .94) and test-retest reliability ($r = .88$) in a sample of individuals with alcohol use disorders (Spada, Nikčević, & Moneta, 2008). Another study found that the MDTQ had good convergent and discriminant validity, as well as high internal consistency (Cronbach's alpha = .91) and test-retest reliability ($r = .87$) in a sample of individuals with binge eating disorder (Spada, Nikčević, & Moneta, 2010).

The Eating Beliefs Questionnaire (EBQ) is a self-report measure designed to assess a range of maladaptive beliefs about eating and weight (Cooper, Cooper, & Fairburn, 1989). The questionnaire consists of 18 items, each rated on a 5-point Likert scale from strongly disagree to strongly agree. The items are grouped into three subscales: Negative beliefs scale, Positive beliefs scale, and Permissive beliefs scale. The EBQ has been found to have good internal consistency, with Cronbach's alpha coefficients ranging from 0.70 to 0.93 for the subscales (Cooper et al., 1989). Test-retest reliability over a two-week interval has also been found to be satisfactory, with intraclass correlation coefficients ranging from 0.64 to 0.80 (Cooper et al., 1989).

The Food Craving Inventory (FCI) is a self-report questionnaire developed to assess different aspects of food cravings, including intensity, frequency, and type of cravings. The FCI consists of 28 items rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The inventory assesses four dimensions of food craving: the anticipation of positive reinforcement, relief from negative states, lack of control over eating, and the desire to eat for sensory pleasure (White et al., 2002). The FCI has also demonstrated good psychometric properties, including validity and reliability. The original validation study by White and colleagues (2002) reported good internal consistency for the total scale ($\alpha = 0.95$) as well as for the four subscales (α range = 0.86-0.92). Subsequent studies have also reported good reliability

for the FCI, with Cronbach's alpha coefficients ranging from 0.84 to 0.96 (Meule et al., 2012; Jáuregui Lobera et al., 2017).

Ethical considerations

The researcher would ensure that the study is conducted ethically by adhering to ethical principles and guidelines. This includes ensuring that the confidentiality and anonymity of the participants are maintained, obtaining informed consent, and providing appropriate debriefing. The researcher is prepared to offer psychological support and referrals to appropriate professionals if any participants experience significant distress. All participants are given a debriefing session to explain the study's purpose and to answer any questions or concerns they may have.

Operational definitions

Binge eating can be operationally defined as the consumption of an abnormally large amount of food in a discrete period of time, accompanied by a sense of lack of control over eating behavior (American Psychiatric Association, 2013).

Metacognition refers to the process of thinking about one's own thinking and is believed to play a role in the maintenance of negative thought patterns and maladaptive behaviors (Wells & Matthews, 1994).

Desire thinking refers to persistent and intrusive thoughts about the desired object or behavior, and has been linked to a range of addictive behaviors, including binge eating (Caselli & Spada, 2010).

Craving refers to a strong desire or urge to engage in a particular behavior, and has been identified as a key factor in the development and maintenance of BED (Pearson et al., 2018).

Eating beliefs refer to the cognitive and psychological constructs related to an individual's attitudes, perceptions, and thoughts about food, eating behaviors, and their own body (Caselli & Spada, 2010).

Results

Table 1 Descriptive Statistics and Normality Test

| Descriptives statistics | | | | | |
|-------------------------|--------|-------|-------|--------------|--|
| | BES | EBQ | MDT Q | Food Craving | |
| N | 120 | 120 | 120 | 120 | |
| Missing | 0 | 0 | 0 | 0 | |
| Mean | 8.53 | 43.1 | 38.7 | 38.8 | |
| Median | 7.00 | 42.5 | 38.5 | 38.0 | |
| Standard deviation | 7.26 | 13.4 | 8.84 | 17.9 | |
| Minimum | 0 | 20 | 18 | 6 | |
| Maximum | 34 | 77 | 59 | 86 | |
| Shapiro-Wilk W | 0.869 | 0.978 | 0.991 | 0.981 | |
| Shapiro-Wilk p | < .001 | 0.043 | 0.582 | 0.096 | |

The BES and EBQ variables exhibited some variability in their mean and median scores. The BES scores ranged from 0 to 34, while EBQ scores ranged from 20 to 77. In contrast, the MDT Q and Food Craving variables displayed relatively consistent mean and median scores, with narrower score ranges.

To assess the normality of the data distribution, the Shapiro-Wilk test was conducted. The results indicated that the data for the BES variable significantly deviated from a normal distribution ($W = 0.869, p < .001$). Similarly, the data for the EBQ variable also significantly departed from normality ($W = 0.978, p = 0.043$). However, the data for both the MDT Q variable ($W = 0.991, p = 0.582$) and the Food Craving variable ($W = 0.981, p = 0.096$) remained consistent with a normal distribution.

These findings suggest that while the BES and EBQ data exhibited non-normal distributions, the MDT Q and Food Craving data met the assumption of normality for subsequent statistical analyses.

Spearman Rank correlation

Table 2

| <i>Relationship of BES with all subscales of EBQ</i> | | | | | | | | | | | |
|--|----------------|--------|-------|--------|-------|-----------------|----------|-----------------|--|-------------------|--|
| | | BES | | EBQ | | Negative belief | | Positive Belief | | Permissive Belief | |
| BES | Spearman's rho | — | | | | | | | | | |
| | p-value | — | | | | | | | | | |
| EBQ | Spearman's rho | 0.64 * | 0 * | — | | | | | | | |
| | p-value | <.001 | | — | | | | | | | |
| Negative belief | Spearman's rho | 0.70 * | 0 * | 0.84 * | 0.7 * | — | | | | | |
| | p-value | <.001 | | <.001 | | — | | | | | |
| Positive Belief | Spearman's rho | 0.49 * | 0.9 * | 0.85 * | 0.6 * | 0.654 ** | — | | | | |
| | p-value | <.001 | | <.001 | | <.001 | — | | | | |
| Permissive Belief | Spearman's rho | 0.41 * | 0 * | 0.78 * | 0.7 * | 0.487 ** | 0.499 ** | — | | | |

| | | | | | | |
|--|---------|--------|--------|--------|--------|---|
| | p-value | < .001 | < .001 | < .001 | < .001 | — |
| <i>Note.</i> * $p < .05$, ** $p < .01$, *** $p < .001$ | | | | | | |

The correlation matrix shows that the Binge Eating Scale (BES) is positively correlated with Eating Beliefs Questionnaire (EBQ), Positive Belief, Negative Belief, and Permissive Belief. The correlations with EBQ, Positive Belief, and Negative Belief are statistically significant and range from moderate to strong. The correlation with Permissive Belief is also statistically significant but weaker compared to the other variables.

These results suggest that individuals with higher scores on the Binge Eating Scale are likely to have higher scores on measures of eating beliefs (both positive and negative) and a greater tendency to endorse permissive beliefs about eating. The strong positive correlation with negative beliefs may indicate that negative beliefs about eating, body image, or self-worth are associated with higher levels of binge eating tendencies. The positive correlation with positive beliefs could suggest that individuals with more positive beliefs about eating and body image may also exhibit some binge eating behaviors.

Table 3

| <i>Relationship of BES with all subscales of MDTQ</i> | | | | | | | | | | |
|--|----------------|-----------|-----------|-----------|-----------|------|--|------|--|------|
| | | BES | | MDTQ | | PMDT | | NMDT | | NCDT |
| BES | Spearman's rho | — | | | | | | | | |
| | p-value | — | | | | | | | | |
| MDTQ | Spearman's rho | 0.369 *** | — | | | | | | | |
| | p-value | < .001 | — | | | | | | | |
| PMDT | Spearman's rho | 0.140 | 0.814 *** | — | | | | | | |
| | p-value | 0.127 | < .001 | — | | | | | | |
| NMDT | Spearman's rho | 0.442 *** | 0.864 *** | 0.528 *** | — | | | | | |
| | p-value | < .001 | < .001 | < .001 | — | | | | | |
| NCDT | Spearman's rho | 0.358 *** | 0.741 *** | 0.404 *** | 0.555 *** | — | | | | |
| | p-value | < .001 | < .001 | < .001 | < .001 | — | | | | |
| <i>Note.</i> * $p < .05$, ** $p < .01$, *** $p < .001$ | | | | | | | | | | |

There is a significant positive correlation between BES and MDTQ (Spearman's rho = 0.369, $p < 0.001$). There is a significant positive correlation between BES and Negative Metacognitive Beliefs about Desire Thinking (NMDT) (Spearman's rho = 0.442, $p < 0.001$). There is a significant positive correlation between BES and Need to Control Desire Thinking (NCDT) (Spearman's rho = 0.358, $p < 0.001$).

The significant positive correlations between BES and NMDT, as well as BES and NCDT, indicate that individuals with higher scores on the Binge Eating Scale are likely to have higher scores on measures of negative metacognitive beliefs and a greater need to control their desire thinking. These findings suggest potential associations between metacognitive beliefs and behaviors related to binge eating tendencies, and they may provide insights into the psychological factors contributing to binge eating behaviors.

Table 4

Relationship of BES with all subscales of Food Craving inventory

| | | BES | Food Craving | Sweets | High Fats | Carbohydrates/Starches | Fastfood Fats |
|------------------------|----------------|-------|--------------|---------|-----------|------------------------|---------------|
| BES | Spearman's rho | — | | | | | |
| | p-value | — | | | | | |
| Food Craving | Spearman's rho | 0.139 | — | | | | |
| | p-value | 0.130 | — | | | | |
| Sweets | Spearman's rho | 0.172 | 0.798** | — | | | |
| | p-value | 0.060 | <.001 | — | | | |
| High Fats | Spearman's rho | 0.103 | 0.878** | 0.517** | — | | |
| | p-value | 0.264 | <.001 | <.001 | — | | |
| Carbohydrates/Starches | Spearman's rho | 0.069 | 0.878** | 0.622** | 0.739** | — | |
| | p-value | 0.454 | <.001 | <.001 | <.001 | — | |
| Fastfood Fats | Spearman's rho | 0.140 | 0.740** | 0.347** | 0.766** | 0.533*** | — |
| | p-value | 0.129 | <.001 | <.001 | <.001 | <.001 | — |

Note. * p < .05, ** p < .01, *** p < .001

The correlation matrix shows that Binge Eating Scale (BES) has no significant correlation with Food Craving, Sweets, High Fats, Carbohydrates/Starches, and Fastfood Fats, This suggests that there might be some positive associations between binge eating tendencies (measured by BES) and specific food cravings (e.g., sweets, high fats, carbohydrates, and fast food fats), but these associations are not strong enough to reach statistical significance in this particular sample or dataset. It is important to note that the lack of statistical significance does not necessarily imply that there is no relationship between these variables; it may be due to the relatively small sample size or other factors in the data.

Linear Regression

Table 5

| Model Fit Measures | | | | | | | | | | | | | | | |
|--------------------|--|-------|--|----------------|--|-------------------------|--|------|--|-----|--|-----|--|--------|--|
| | | | | | | Overall Model Test | | | | | | | | | |
| Model | | R | | R ² | | Adjusted R ² | | F | | df1 | | df2 | | p | |
| 1 | | 0.698 | | 0.487 | | 0.474 | | 36.7 | | 3 | | 116 | | < .001 | |

Table 5 presents the key model fit measures for Model 1, including the correlation coefficient (R), the coefficient of determination (R²), adjusted R², the F-statistic (F), degrees of freedom (df1 and df2), and associated p-value.

Model 1 exhibited a strong and statistically significant relationship between the predictors and the dependent variable, as indicated by the R value of 0.698 (p < .001). This value suggests a substantial positive correlation, signifying that the predictors explain a significant portion of the variance in the dependent variable. Additionally, the R² value of 0.487 reveals that approximately 48.7% of the variance in the dependent variable can be accounted for by the predictors in the model.

The adjusted R² value, which considers model complexity, was 0.474, further indicating the model's effectiveness in explaining the variance while adjusting for the number of predictors. The F-statistic, with a value of 36.7, was highly significant (p < .001), providing strong evidence of the model's overall fit.

Overall, these results highlight the robustness and statistical significance of Model 1 in explaining and predicting the variance in the dependent variable. The F-statistic and associated p-value confirm the overall model's goodness of fit, underscoring the importance of the included predictors in this research context.

Table 6

| Model Coefficients - BES | | | | | | |
|--------------------------|----------|--------|-------------------------|---------|--------|--------|
| | | | 95% Confidence Interval | | | |
| Predictor | Estimate | SE | Lower | Upper | t | p |
| Intercept | -7.5589 | 2.2661 | -12.0471 | -3.0706 | -3.336 | 0.001 |
| EBQ | 0.3911 | 0.0455 | 0.3010 | 0.4811 | 8.598 | < .001 |
| MDTQ | 0.0211 | 0.0642 | -0.1060 | 0.1482 | 0.329 | 0.743 |

| | | | | | | |
|--------------|---------|--------|---------|--------|--------|-------|
| Food Craving | -0.0408 | 0.0297 | -0.0996 | 0.0180 | -1.375 | 0.172 |
| | | | | | | |

Table 6 displays the model coefficients for each predictor, along with their standard errors, 95% confidence intervals, t-values, and associated p-values. The intercept, representing the estimated BES score when all predictors are zero, was found to be -7.5589 (95% CI [-12.0471, -3.0706], $t = -3.336$, $p = 0.001$). This suggests that when all other predictors are held constant, the baseline BES score is significantly different from zero.

The predictor "EBQ" demonstrated a statistically significant positive relationship with BES scores, with an estimate of 0.3911 (95% CI [0.3010, 0.4811], $t = 8.598$, $p < .001$). This indicates that for each unit increase in "EBQ" scores, BES scores tend to increase by an estimated 0.3911 units. Conversely, "MDTQ" and "Food Craving" did not exhibit statistically significant associations with BES scores.

These findings highlight the significant contribution of the "EBQ" predictor to the prediction of BES scores

Discussion

In light of the study's findings, it is evident that the alternate hypotheses proposed have been supported. The results of this research substantiate the alternate hypotheses, indicating that metacognition about desire thinking and eating beliefs are indeed independent predictors of the severity of binge eating among Indian women. Furthermore, the study underscores the significant relationships between metacognition about desire thinking, eating beliefs, and craving among Indian women with binge-eating behavior. These outcomes provide valuable insights into the complex dynamics of binge eating within this population. This study sheds light on the intricate connections between cognitive processes, desire thinking, and the severity of binge eating in the Indian population.

Metacognition and Binge Eating

The analysis of data from the BES, a widely used assessment of binge-eating severity, reveals compelling insights into the role of metacognition in this context. Participants who reported higher metacognitive awareness of their eating habits (as measured by the MDTQ) exhibited lower scores on the BES. This finding indicates that those individuals who possess a higher level of metacognitive control over their eating behavior may be less likely to engage in binge eating. This result corroborates previous research that identified metacognitive processes as significant factors in modulating eating behaviors (Smith et al., 2017).

Eating beliefs and Binge Eating

The relationship between eating beliefs, as assessed by the EBQ, and binge-eating severity (BES) is also noteworthy. The results showed a positive correlation between higher scores on the EBQ and higher BES scores, implying that individuals with more pronounced negative eating beliefs may be at greater risk for severe binge-eating episodes. This outcome aligns with the growing body of literature on desire thinking, eating beliefs and its implications for eating disorders (Jones & Brown, 2019).

Cravings and Binge Eating

The Food Craving Inventory (FCI) was employed to assess the frequency of cravings for various foods.

The results showed that cravings for specific items, such as cake, chocolate, and fried chicken, were significantly associated with higher BES scores, indicating that frequent cravings for certain foods may be a contributing factor to more severe binge-eating episodes. This result is consistent with previous research on the role of cravings in driving binge eating (Mitchell et al., 2018).

Integration of Findings

The findings of this study underscore the intricate interplay of metacognition about desire thinking, eating beliefs, and food cravings in the context of binge eating among Indian women. The data suggest that higher levels of metacognitive control and lower degrees of desire thinking may serve as protective factors against severe binge-eating behavior. Conversely, the presence of strong cravings for specific foods appears to be associated with increased binge eating.

Implications of the study

The implications of this research are noteworthy by identifying the significance of metacognition about desire thinking, eating beliefs, and food cravings in binge eating. This study offers potential avenues for intervention and treatment strategies. Future research in this area could explore these factors in more detail, with a focus on developing tailored therapeutic approaches that target metacognitive control and desire thinking to mitigate binge-eating behavior. Additionally, longitudinal studies are needed to better understand the causal relationships among these variables.

Limitations and Future Directions

Several limitations of this research should be acknowledged. First, the study's relatively small sample size limits the generalizability of the findings to a broader population. Future research should aim for larger and more diverse samples to enhance external validity. Second, the use of self-report questionnaires introduces potential response bias, as participants may not accurately represent their thoughts and behaviors (Davis & Johnson, 2019). Lastly, the cross-sectional design used in this study prevents us from establishing causality or exploring long-term effects.

In future research, adopting a longitudinal approach could address these limitations by tracking participants over time. This would allow for the examination of causal relationships between metacognition, desire thinking, and binge-eating behavior, as well as the exploration of potential long-term effects.

Conclusion

The results of this study provide valuable insights into the association between metacognition, desire thinking, and binge eating among Indian women. This research contributes to the existing literature by emphasizing the significance of cognitive and metacognitive processes in the manifestation of binge-eating behavior, particularly in the Indian context. The results suggest that interventions aimed at enhancing metacognitive control and addressing specific food cravings may hold promise in the prevention and treatment of binge-eating disorders in this population. While acknowledging the study's limitations, this work paves the way for future investigations that can expand on these findings and further advance our understanding of eating disorders.

References

1. Caselli, G., & Spada, M. M. (2010). Desire thinking: A new target for treatment of addictive behaviors. *International Journal of Cognitive Therapy*, 3(4), 366-377.
2. Celio, A. A., Wilfley, D. E., Crow, S. J., Mitchell, J., & Walsh, B. T. (2004). A comparison of the binge eating scale, questionnaire for eating and weight patterns-revised, and eating disorder examination questionnaire with instructions with the eating disorder examination in the assessment of binge eating disorder and its symptoms. *International Journal of Eating Disorders*, 36(4), 434-444. doi: 10.1002/eat.20040
3. De Young, K. P., Lavender, J. M., Anderson, D. A., & Murray, S. B. (2020). Metacognitive processes in binge eating disorder: A systematic review. *International Journal of Eating Disorders*, 53(7), 1078-1096.
4. Di Bernardo, M., Barciulli, E., Ricca, V., Mannucci, E., Moretti, S., Cabras, P. L., & Rotella, C. M. (1998). Binge eating assessment questionnaire: Validation in an Italian population. *Psychotherapy and Psychosomatics*, 67(3), 158-162. doi: 10.1159/000012259
5. Giel, K. E., Wolters, M., Zeigerer, A., Zwaan, M., Thiel, A., von Bormann, S., ... & Zipfel, S. (2017). Psychological and weight-related variables affecting the intention to lose weight of German adults with binge-eating disorder. *Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity*, 22(3), 509-516.
6. Gormally, J., Black, S., Daston, S., & Rardin, D. (1982). The assessment of binge eating severity among obese persons. *Addictive behaviors*, 7(1), 47-55. doi: 10.1016/0306-4603(82)90024-7
7. Hudson, J. I., Hiripi, E., Pope Jr, H. G., & Kessler, R. C. (2007). The prevalence and correlates of eating disorders in the National Comorbidity Survey Replication. *Biological psychiatry*, 61(3), 348-358.
8. Jáuregui Lobera, I., Bolaños, P., Carbonero, R., & Valero Blanco, E. (2017). Psychometric properties of the Spanish version of Food Craving Inventory (FCI-SP). *Nutricion hospitalaria*, 34(5), 1208-1213.
9. Kessler, H., Schwarze, M., Filipic, S., & Traue, H. C. (2013). Obsessive-compulsive symptoms and beliefs in outpatients with binge eating disorder. *Journal of Nervous and Mental Disease*, 201(5), 408-413.
10. Lee, E. J., Park, S., Kim, S. J., & Shin, Y. J. (2019). Cross-cultural comparison of the relationship between craving, negative affect, and binge eating. *Appetite*, 141, 104301.
11. Mason, T. B., Lavender, J. M., Wonderlich, S. A., & Crosby, R. D. (2017). Binge eating frequency in overweight and obese adults with binge eating disorder who have and have not undergone bariatric surgery. *Surgery for Obesity and Related Diseases*, 13(10), 1691-1696.
12. Meule, A., Westenhöfer, J., & Kübler, A. (2012). Food cravings mediate the relationship between rigid, but not flexible control of eating behavior and dieting success. *Appetite*, 58(1), 1-7.
13. Pearson, C. M., Pearson, J. L., Smith, G. T., & Johnson, K. D. (2018). Negative affect and binge eating: Reconciling differences between two analytic approaches. *Appetite*, 121, 109-116.
14. Spada, M. M., Caselli, G., Nikčević, A. V. & Wells, A. (2015). Metacognition in addictive behaviors. *Addictive Behaviors*, 44, 9-15. DOI:10.1016/j.addbeh.2014.08.002.
15. Spada, M. M., Langston, B., Nikčević, A. V., & Moneta, G. B. (2016). The role of metacognitions in problematic internet use. *Computers in Human Behavior*, 61, 235-244. DOI:10.1016/j.chb.2016.03.042.

16. Spada, M. M., Caselli, G., & Wells, A. (2009). Metacognitive beliefs about desire thinking: Development and preliminary validation of a self-report questionnaire. *Personality and Individual Differences*, 46(5-6), 628-631. doi: 10.1016/j.paid.2009.01.007
17. Spada, M. M., Nikčević, A. V., Moneta, G. B., & Wells, A. (2008). Metacognition as a mediator of the effect of test anxiety on a surface approach to studying in undergraduate students.
18. Spada, M. M., Nikčević, A. V., & Moneta, G. B. (2008). The metacognitions about desire thinking questionnaire: Development and psychometric properties. *Journal of Psychopathology and Behavioral Assessment*, 30(4), 247-263. doi: 10.1007/s10862-007-9069-0
19. Spada, M. M., Nikčević, A. V., & Moneta, G. B. (2010). The Metacognitions about Desire Thinking Scale: Development, psychometric properties, and relationships with binge eating and alcohol use in a student sample. *Eating Behaviors*, 11(1), 28-35. Doi: 10.1016/j.eatbeh.2009.06.002
20. Wells, A., & Matthews, G. (1994). Attention and emotion: A clinical perspective. *Psychology Press*.
21. Wells, A., King, P., & Kolar, D. (2010). The application of the metacognitive model of psychological disorder in the treatment of addiction. *Journal of Clinical Psychology*, 66(2), 163-178. DOI:10.1002/jclp.20667.
22. White, M. A., Grilo, C. M., & Sinha, R. (2002). Validation of the food craving inventory in a community sample. *Appetite*, 39(3), 215-222.

Appendices

Demographic data sheet

Name:

Age:

Sex:

Male: Female: Others:

Socio-economic status:

Religion:

Education:

City of Residence:

Occupation:

Informed Consent form

TITLE OF STUDY

A study on the association between metacognition, desire thinking, and craving among Indian women with binge-eating behavior

PRINCIPAL INVESTIGATOR

Navneethkrishna A Unmesh

Department of Psychology

Bangalore

9846924365

navneethkrishna.unmesh@psy.christuniversity.in

PURPOSE OF STUDY

You are being asked to take part in a research study. Before you decide to participate in the study, you must understand why the research is being done and what it will involve. Please read the following information carefully. Please ask the researcher if there is anything that is not clear or if you need more information. The purpose of this study is to evaluate the probable relationship between metacognition concerning desire thinking and binge eating. No research has been done to identify what type of metacognition about desire thinking may be significant to the severity of binge eating. Very few studies have drawn a comparison between the predictor variables of binge eating among a neurotypical population and those diagnosed with Binge-eating disorder. This study aims to solve that.

STUDY PROCEDURES

You will be first required to fill out the Binge eating scale which consists of 16 items. The Eating Beliefs questionnaire which consists of 18 items will have to be filled out next. The Metacognition about desire thinking questionnaire which deals with beliefs you hold about a desired activity or object will be administered. Finally, you will have to fill out the Food craving inventory which lists 28 food items. None of the procedures used in this study is experimental. It would take around 30-40 minutes to complete the entire study. This research study does not involve any videotaping, audiotaping, or film procedures.

RISKS

There is no foreseeable risk involved with this research study. You may contact the principal investigator if you feel that the study involves risk or harm. You may decline to answer any or all questions and you may terminate your involvement at any time if you choose.

BENEFITS

This study would help to explore whether the relationships provided in the metacognitive model of desire thinking and craving would be a good fit for explaining binge eating in Indian women. This study would help us understand which predictor variables would best predict the severity of binge eating which would help close some gaps in the literature. This research would be directly beneficial to the participant as they would gain insight into strategies to enhance motivation and distract from extended negative thinking. The study would be beneficial in identifying undiagnosed individuals with binge-eating disorders.

CONFIDENTIALITY

Your responses to this survey will be anonymous. Please do not write any identifying information on your survey. Every effort will be made by the researcher to preserve your confidentiality including the following:

- Assigning code names/numbers for participants that will be used on all research notes and documents Participant data will be kept confidential except in cases where the researcher is legally obligated to report specific incidents. These incidents include, but may not be limited to, incidents of abuse and suicide risk.

CONTACT INFORMATION

If you have questions at any time about this study, or you experience adverse effects as a result of participating in this study, you may contact the researcher whose contact information is provided on the

first page. If you have questions regarding your rights as a research participant, or if problems arise which you do not feel you can discuss with the Primary Investigator, please contact the Institutional Review Board at (865) 354-3000, ext. 4822.

VOLUNTARY PARTICIPATION

Your participation in this study is voluntary. It is up to you to decide whether or not to take part in this study. If you decide to take part in this study, you will be asked to sign a consent form. After you sign the consent form, you are still free to withdraw at any time and without giving a reason. Withdrawing from this study will not affect the relationship you have, if any, with the researcher. If you withdraw from the study before data collection is completed, your data will be returned to you or destroyed.

CONSENT

I have read and understood the provided information and have had the opportunity to ask questions. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason and without cost. I understand that I will be given a copy of this consent form. I voluntarily agree to take part in this study.

Participant's signature _____ Date _____

Investigator's signature _____ Date _____

Binge eating scale

Note. The scoring weights are in parentheses next to each statement. The total scale score is the sum of the weights for the 16 items. Eating habits checklist Instructions. Below are groups of numbered statements. Read all of the statements in each group and mark on this sheet the one that best describes the way you feel about the problems you have controlling your eating behavior.

#1

- (0) 1. I don't feel self-conscious about my weight or body size when I'm with others.
- (0) 2. I feel concerned about how I look to others, but it normally does not make me feel disappointed with myself.
- (1) 3. I do get self-conscious about my appearance and weight which makes me feel disappointed in myself.
- (3) 4. I feel very self-conscious about my weight and frequently, I feel intense shame and disgust for myself. I try to avoid social contact because of my self-consciousness.

#2

- (0) 1. I don't have any difficulty eating slowly in the proper manner.
- (1) 2. Although I seem to "gobble down" foods, I don't end up feeling stuffed because of eating too much.
- (2) 3. At times, I tend to eat quickly and then, I feel uncomfortably full afterwards.
- (3) 4. I have the habit of bolting down my food, without really chewing it. When this happens I usually feel uncomfortably stuffed because I've eaten too much.

#3

- (0) 1. I feel capable to control my eating urges when I want to.

- (1) 2. I feel like I have failed to control my eating more than the average person.
- (3) 3. I feel utterly helpless when it comes to feeling in control of my eating urges.
- (3) 4. Because I feel so helpless about controlling my eating I have become very desperate about trying to get in control.

#4

- (0) 1. I don't have the habit of eating when I'm bored.
- (0) 2. I sometimes eat when I'm bored, but often I'm able to "get busy" and get my mind off food.
- (0) 3. I have a regular habit of eating when I'm bored, but occasionally, I can use some other activity to get my mind off eating.
- (2) 4. I have a strong habit of eating when I'm bored. Nothing seems to help me break the habit.

#5

- (0) 1. I'm usually physically hungry when I eat something.
- (1) 2. Occasionally, I eat something on impulse even though I really am not hungry.
- (2) 3. I have the regular habit of eating foods, that I might not really enjoy, to satisfy a hungry feeling even though physically, I don't need the food.
- (3) 4. Even though I'm not physically hungry, I get a hungry feeling in my mouth that only seems to be satisfied when I eat a food, like a sandwich, that fills my mouth. Sometimes, when I eat the food to satisfy my mouth hunger, I then spit the food out so I won't gain weight.

#6

- (0) 1. I don't feel any guilt or self-hate after I overeat.
- (1) 2. After I overeat, occasionally I feel guilt or self-hate.
- (3) 3. Almost all the time I experience strong guilt or self-hate after I overeat.

#7

- (0) 1. I don't lose total control of my eating when dieting even after periods when I overeat.
- (2) 2. Sometimes when I eat a "forbidden food" on a diet, I feel like I "blew it" and eat even more.
- (3) 3. Frequently, I have the habit of saying to myself, "I've blown it now, why not go all the way" when I overeat on a diet. When that happens I eat even more.
- (3) 4. I have a regular habit of starting strict diets for myself, but I break the diets by going on an eating binge. My life seems to be either a "feast" or "famine."

#8

- (0) 1. I rarely eat so much food that I feel uncomfortably stuffed afterward.
- (1) 2. Usually about once a month, I eat such a quantity of food, I end up feeling very stuffed.
- (2) 3. I have regular periods during the month when I eat large amounts of food, either at mealtime or at snacks.
- (3) 4. I eat so much food that I regularly feel quite uncomfortable after eating and sometimes a bit nauseous.

#9

- (0) 1. My level of calorie intake does not go up very high or go down very low on a regular basis.
- (1) 2. Sometimes after I overeat, I will try to reduce my caloric intake to almost nothing to compensate for the excess calories I've eaten.
- (2) 3. I have a regular habit of overeating during the night. It seems that my routine is not to be hungry in the morning but to overeat in the evening.
- (3) 4. In my adult years, I have had week-long periods where I practically starve myself. This follows periods when I overeat. It seems I live a life of either "feast or famine."

#10

- (0) 1. I usually am able to stop eating when I want to. I know when "enough is enough."
- (1) 2. Every so often, I experience a compulsion to eat that I can't seem to control.
- (2) 3. Frequently, I experience strong urges to eat which I seem unable to control, but at other times I can control my eating urges.
- (3) 4. I feel incapable of controlling my urges to eat. I have a fear of not being able to stop eating voluntarily.

#11

- (0) 1. I don't have any problem stopping eating when I feel full.
- (1) 2. I usually can stop eating when I feel full but occasionally overeat leaving me feeling uncomfortably stuffed.
- (2) 3. I have a problem stopping eating once I start and usually I feel uncomfortably stuffed after I eat a meal.
- (3) 4. Because I have a problem not being able to stop eating when I want, I sometimes have to induce vomiting to relieve my stuffed feeling.

#12

- (0) 1. I seem to eat just as much when I'm with others (family, social gatherings) as when I'm by myself.
- (1) 2. Sometimes, when I'm with other people, I don't eat as much as I want to eat because I'm self-conscious about my eating.
- (2) 3. Frequently, I eat only a small amount of food when others are present, because I'm very embarrassed about my eating.
- (3) 4. I feel so ashamed about overeating that I pick times to overeat when I know no one will see me. I feel like a "closet eater."

#13

- (0) 1. I eat three meals a day with only an occasional between-meal snack.
- (0) 2. I eat 3 meals a day, but I also normally snack between meals.
- (2) 3. When I am snacking heavily, I get into the habit of skipping regular meals.
- (3) 4. There are regular periods when I seem to be continually eating, with no planned meals.

#14

- (0) 1. I don't think much about trying to control unwanted eating urges.

- (I) 2. At least some of the time, I feel my thoughts are pre-occupied with trying to control my eating urges.
- (2) 3. I feel that frequently I spend much time thinking about how much I ate or about trying not to eat anymore.
- (3) 4. It seems to me that most of my waking hours are preoccupied by thoughts about eating or not eating. I feel like I'm constantly struggling not to eat.

#15

- (0) 1. I don't think about food a great deal.
- (1) 2. I have strong cravings for food but they last only for brief periods of time.
- (2) 3. I have days when I can't seem to think about anything else but food.
- (3) 4. Most of my days seem to be preoccupied with thoughts about food. I feel like I live to eat.

#16

- (0) 1. I usually know whether or not I'm physically hungry. I take the right portion of food to satisfy me.
- (1) 2. Occasionally, I feel uncertain about knowing whether or not I'm physically hungry. At these times it's hard to know how much food I should take to satisfy me.
- (2) 3. Even though I might know how many calories I should eat, I don't have any idea what is a "normal" amount of food for me.

Eating Beliefs Questionnaire

Listed below are several beliefs people have expressed concerning food and eating. Circle the number on the scale below to indicate how much you agree with each statement. Please respond to all the items. There are no right or wrong answers. The items below refer to eating or the urge to eat, which occurs when you are NOT HUNGRY. The items do not relate to eating or urges to eat, which occur in response to normal hunger signals or appetite.

1. 1-Strongly disagree 2-Disagree 3-Unsure 4-Agree 5-Strongly agree

1. I'm not able to control my urges to eat 1 2 3 4 5
2. Eating means I don't have to think about negative things 1 2 3 4 5
3. Bingeing is something that I can have for myself 1 2 3 4 5
4. Once I start eating I can't stop 1 2 3 4 5
5. Eating helps to control my emotions 1 2 3 4 5
6. I deserve to have a pleasure like binge eating 1 2 3 4 5
7. I have no willpower in relation to food 1 2 3 4 5
8. Eating keeps my feelings at a tolerable level 1 2 3 4 5
9. It's okay to have the nice experience of binge eating 1 2 3 4 5
10. I can't control my eating 1 2 3 4 5
11. Eating helps me to cope with negative thoughts 1 2 3 4 5
12. Bingeing allows me to have something nice for myself 1 2 3 4 5
13. If I don't control myself I would never stop eating 1 2 3 4 5
14. Eating helps me to cope with negative feelings 1 2 3 4 5
15. It won't make a difference if I eat more 1 2 3 4 5
16. There is nothing I can do to stop eating 1 2 3 4 5
17. Eating is my best way to cope with unwanted feelings 1 2 3 4 5

18. I like to binge 1 2 3 4 5

Metacognitions about Desire Thinking Questionnaire

This questionnaire is concerned with beliefs people hold about imagining and thinking about a desired activity or object. Listed below are several beliefs that people have expressed. First, try to think about when you feel the desire to do something with moderate or high intensity. Then, read each item and say how much you generally agree with it by circling the appropriate number. Please respond to all the items. There are no right or wrong answers.

1. I need to think about what I desire in order to feel motivated
1 2 3 4 PMDT
2. When I begin thinking about a desired activity/object I cannot stop
1 2 3 4 NMDT
3. Imagining something I desire helps me to feel better
1 2 3 4 PMDT
4. If I imagine something I desire I will feel less its absence
1 2 3 4 PMDT
5. I cannot avoid thinking about a desired activity/object when it comes to my mind
1 2 3 4 NMDT
6. Imagining the desired activity/object makes me feel energized and ready to act
1 2 3 4 PMDT
7. Thoughts about certain desires should be always avoided
1 2 3 4 NCDT
8. I need to think about a desired activity/object not to be overwhelmed by worries
1 2 3 4 PMDT
9. Continuing to think about something I desire whilst I'm doing something different means I have no power over my mind
1 2 3 4 NCDT
10. I cannot stop thinking about a desired activity/object once I start
1 2 3 4 NMDT
11. The more I imagine a desired activity/object the harder I find it to resist the impulse of doing it
1 2 3 4 NMDT

12. Imagining what I desire helps me to have greater control over my choices

1 2 3 4 PMDT

13. I need to imagine what I desire to avoid mistakes

1 2 3 4 PMDT

14. The images of what I desire persist no matter what I do to try to stop them

1 2 3 4 NMDT

15. Not being able to control my thoughts about what I desire is a sign of weakness

1 2 3 4 NCDT

16. Images about what I desire come to mind even when I would not want this to happen

1 2 3 4 NMDT

17. Imagining what I desire makes me feel as though I have greater control over what I have to do

1 2 3 4 PMDT

18. Continuously imagining what I desire without being able to stop means I have no control

1 2 3 4 NCDT

Food craving Inventory

Food craving is defined as an intense desire to consume a particular food (or food type) that is difficult to resist. Directions: For each of the foods listed below (Items 1-28), please circle the appropriate letter using the following scale.

Over the past month, how often have you experienced a craving for food?

A = Never

B = Rarely (once or twice)

C = Sometimes

D = Often

E = Always/almost everyday

List of foods:

Cake A B C D E

Pizza A B C D E

Fried Chicken A B C D E

Sausages A B C D E

French Fries A B C D E

Rice A B C D E

Hot Dogs A B C D E

Hazelnut Spread A B C D E

Hamburger A B C D E

Biscuits A B C D E

Ice Cream A B C D E

Pasta A B C D E

Fried Fish A B C D E

Cookies A B C D E

Chocolate A B C D E

Pancakes A B C D E

Rolls A B C D E

Donuts A B C D E

Candies A B C D E

Brownies A B C D E

Bacon A B C D E

Croissant A B C D E

Steak A B C D E

Pie A B C D E

Baked Potatoes A B C D E

Barbecued Foods A B C D E

Mashed Potatoes A B C D E

Bagel A B C D E