

ADDICTIVE TENDENCIES TOWARDS FOOD: A MULTI-METHOD ANALYSIS
OF 'FOOD ADDICTION' AND RELATED PSYCHOPATHOLOGIES

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ABSTRACT

This dissertation comprises two sequential multi-method studies: a quantitative followed by a qualitative study. The primary aim of the first study was to confirm our previous research examining compulsive grazing in a clinical population with obesity and a higher prevalence and severity of food addiction (FA). Moderating effects of weight and sex on the severity and frequency of FA were also explored. Adults with obesity (aged 20 to 50 years) were recruited from a weight-management clinic (n=437). Participants completed an online questionnaire assessing various eating behaviours and related personality measures. Multiple and logistic regression modelling were used with the Yale Food Addiction Scale symptom count and diagnosis as the dependent variables, respectively. A chi-square test of independence and an analysis of variance were used to determine sex differences. Compulsive grazing was a significant factor in FA diagnosis and symptom severity, confirming previous findings. Females from a weight-management clinic sample were more likely to receive an FA diagnosis than females from the general population.

The purpose of the second study was three-fold: 1) to explore perceptions of compulsive grazing in individuals with overweight and obesity; 2) to understand where compulsive grazing fits within the spectrum of overeating, particularly in relation to FA; and 3) to assess if the FA concept reflects participants' experiences. Females (n=34) from the first study were recruited and interviewed virtually using semi-structured interviews. Interviews were transcribed verbatim. A flexible coding system was developed, which led to a final list of three categories. Notably, findings indicated varied eating behaviours among those with FA (binge eating, compulsive grazing, or a combination of both). Accordingly, a new conceptualization of FA was

proposed. Lastly, participants identified bariatric surgery and pharmacologic treatments as effective for managing cravings and compulsive eating.

Overall, this dissertation provided a holistic understanding of FA and its associated behaviors. This dissertation contributes to the increasing recognition of FA as a genuine substance-use disorder, which can hopefully have an impact on public health by reducing obesity stigma and enhancing treatment access for individuals with FA.

DEDICATION

To my parents,
Hana and Arie

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LIST OF ABBREVIATIONS

The following table outlines the abbreviations used throughout the dissertation in alphabetical order. The page on which each one is first used is also given.

Abbreviation	Word / Phrase	Page
ANOVA	Analysis of variance	32
BIS-11	Barratt Impulsiveness Scale version 11	30
BED	Binge eating disorder	15
BEQ	Binge Eating Questionnaire	29
BMI	Body mass index	5
DSM-5	Diagnostic and Statistical Manual-5	6
EPQ-R	Eysenck Personality Questionnaire-Revised	30
FA	Food addiction	5
LOC	Loss of control	15
MLGP	Multi-locus genetic profile	8
PI	Principal investigator	64
QD	Qualitative Description	56
RED	Reward-Based Eating Drive Scale	30
Rep-Q	Rep(eat) Questionnaire	30
YFAS	Yale Food Addiction Scale	7

CHAPTER 1: GENERAL INTRODUCTION

Approximately 170,000 years ago, our ancestral relatives, the *Neanderthals*, reached a significant technological milestone by learning to cook food using fire (Aranguren et al., 2018). This development enabled more efficient calorie consumption and energy conservation by reducing the effort required to chew and digest (Ocobock et al., 2021). Consequently, Neanderthals were able to meet their daily caloric needs in about an hour, in stark contrast to chimpanzees – another ancestral relative – who require five hours a day to fulfill their caloric needs through raw foods (Harari pg. 35, 2015).

Most of *Homo sapiens*' history involved living as hunters and gatherers (see Alt et al., 2022 for a review). Their survival was closely linked to their ability to procure food through hunting, fishing, and foraging (Alt et al., 2022). This was influenced by seasonal changes, climate, resource availability, and the ecosystems they inhabited (Bar-Yosef, 2017). Fluctuating conditions often led to food deficiencies (Alt et al., 2022). As a result, humans evolved to find calorie-dense foods (e.g. fruit, meat) more pleasurable and rewarding to consume, even in the absence of hunger – a genetic advantage deemed the "thrifty genotype" (Davis, 2013a; Neel, 1962). This allowed for the accumulation of excessive adiposity, aiding survival during unpredictable food availability (Davis, 2013a). The shift to an agriculture lifestyle about 250 years ago – marked by self-sustenance through gardening and farming – only represents 1% of human evolution (Alt et al., 2022). This lifestyle was further transformed around 200 years ago through the Industrial Revolution, leading to the concomitant advent of mass food production (Mohajan, 2019).

Ultra-processed foods¹ are evolutionarily-novel, industrially-manufactured items formulated from cheap calorie sources, rich in carbohydrates, fat, and/or sodium (e.g. candy, chips, donuts) (Monteiro et al., 2019). Ultra-processed foods are unique in that the *combination* of properties (e.g. sugar, fats, salt, and chemical and flavour additives) enhances the food's pleasurable properties independently of its taste (Monteiro & Cannon, 2023). For example, it has been shown that foods high in both fat and carbohydrates are more pleasurable than those with only one of these components (DiFeliceantonio et al., 2018; Markus et al., 2017). The term “hedonic hunger” has been relatively recently proposed as a “new dimension of appetite” – depicting the subjective cravings that make one eat in response to the rewarding properties of food as opposed to homeostatic hunger (Lowe & Butryn, 2007). As such, while our “thrifty genotype” was adaptive in an environment of food scarcity – typical during the hunter-gatherer era – it has become maladaptive in the modern world where the variety and availability of foods are superfluous (Gearhardt et al., 2011a). Today, ultra-processed foods are ubiquitously available around the clock, and comprise a substantial portion of our daily diet (da Silva Júnior et al., 2023; Davis, 2013a; Gearhardt & DiFeliceantonio, 2023). The outcome is an evolutionary “mismatch” that can promote chronic and excessive intake of food (and weight gain), especially in certain vulnerable individuals (Gearhardt et al., 2011a; Neel, 1962).

After a period of food deprivation, all foods will stimulate the brain’s mesocorticolimbic dopamine system – the *reward pathway* – since we have evolved to experience pleasure from activities essential for survival, motivating us to invest time and energy seeking food (Davis, 2013a; Wise, 1987). This pathway originates in the ventral tegmental area and extends to the limbic system, including the amygdala, and the striatal areas of the basal ganglia; and is

¹The term comes from the NOVA Food Classification System, which is the most commonly used classification system for categorizing foods based on their level of processing (Monteiro et al., 2019; Pagliai et al., 2021).

interconnected with the prefrontal cortex through afferent and efferent connections (Tomasi & Volkow, 2013). However, while it is true that all foods activate the reward pathway after a period of deprivation, ultra-processed foods trigger a more potent brain response than foods that are naturally available (Gearhardt & DiFeliceantonio, 2023; Lustig, 2020; Monteiro & Cannon, 2023; Schulte et al., 2015). In other words, ultra-processed foods activate the mesocorticolimbic reward system more reliably and to a greater degree than non-processed foods, such as fruits and vegetables (Campos et al., 2022). Pre-clinical models have shown that ultra-processed foods increase dopamine levels in the striatum to a similar level as nicotine (De Luca, 2014; Hajnal et al., 2004).

Individuals prone to addiction tend to exhibit hypersensitivity towards rewarding stimuli, and therefore, display decreased self-regulation and ability to inhibit maladaptive behaviors (see Volkow et al., 2017 for an excellent review). Continued consumption of an addictive substance can lead to reduced sensitivity – a dampened pleasure signal, or a ‘dysfunctional’ reward pathway (Volkow et al., 2013, 2019). The original reaction to the drug weakens, necessitating either larger amounts or more frequent usage to achieve the same level of response as initially experienced (Volkow et al., 2013, 2019). In other words, over time, post-synaptic downregulation causes desensitization of the reward pathway, so greater dopamine release is needed to achieve the same level of stimulation or reward (Gorwood, 2008). This phenomenon, known as tolerance, is a fundamental characteristic of substance-use addiction (Volkow et al., 2016). Preclinical studies have shown downregulation of dopamine receptor availability, and a significant decrease in baseline dopamine levels in the nucleus accumbens, in rodents exposed to high-fat diets (Rada et al., 2010; Van De Giessen et al., 2012). Additionally, reduced dopamine signaling in the striatum has been observed in some adults with obesity (de Weijer et al., 2011).

For instance, positron emission tomography scans revealed that individuals with higher levels of obesity had considerably lower dopamine D2 receptor densities in the striatum than individuals without obesity (de Weijer et al., 2011). This continued disruption of the reward network worsens the addiction, and can result in heightened consumption, stronger cravings, and persistent use despite adverse effects (Burger, 2023; Volkow et al., 2013, 2019). Due to the intense and prolonged reward stimulation in substance users, followed by this downregulation, there is a marked reduction in their sensitivity or reaction to any form of reward – also known as anhedonia (Gorwood, 2008). Accordingly, pre-clinical models have shown that rodents exposed to a high-fat diet display elevated levels of depressive and anxiety-like behaviours – as evidenced by increased immobilization time during tail suspension and forced swim tests (Li et al., 2022; Vagena et al., 2019). In summary, the path to addiction can occur due to an inherited predisposition towards heightened reward sensitivity, or poor self-regulation and impulsiveness as an inherited trait, or alternatively, a transformation to these states due to overuse of potent dopamine activators; or a combination of all these factors (Volkow et al., 2010).

Compulsive consumption with a rapid escalation of intake is another defining feature of addiction (Burger, 2023; Volkow et al., 2013, 2019). As with conventional addictive substances, having a strong preference for ultra-processed foods can lead to an increased tendency to overeat them (Alsiö et al., 2012). This may then create a continuous cycle of intense cravings and compulsive overeating (Alsiö et al., 2012). This cycle is often resistant to change and prone to relapse – attempts to reduce the intake of such foods are often unsuccessful (Oginsky et al., 2016; Pursey et al., 2019). A meta-analysis confirmed that food-cue reactivity, cue-induced cravings, and general food cravings were indicators of increased food consumption and body

mass index (BMI) (Boswell & Kober, 2016). The authors concluded that exposure to food and drug cues produces similar effects in affected individuals (Boswell & Kober, 2016).

Cravings are a core component of withdrawal, since they represent an enhanced motivational drive to consume a substance (Koskela et al., 2018). Withdrawal depicts the change from consuming a substance due to its rewarding properties, to using it to alleviate physical and emotional discomfort (American Psychiatric Association, 2013). In animal models, withdrawal from sugar is associated with notable neural reward alternations, particularly decreased dopamine in the nucleus accumbens, and by higher cortical and subcortical concentrations of dopamine (Johnson & Kenny, 2010; Kim et al., 2018). Clinically, abstinence from palatable foods has been shown to induce negative emotional and physical symptoms, including headaches, irritability, and flu-like symptoms (Gearhardt et al., 2016; Ifland et al., 2009). Similarly, dieting is associated with elevated stress and depression in individuals with and without obesity (Goldschmidt et al., 2016). Irritability (feeling “hangry”) during food abstinence is also common. For example, women with lower glucose levels exhibited more aggression towards their spouse (more frequently delivered aversive noise blasts and stabbed pins into a voodoo doll that symbolized them), compared to those with normal glucose levels (Bushman et al., 2014). Interestingly, when parents restricted access to highly-palatable foods, withdrawal symptoms (e.g. feeling agitated and irritable) were predominant (51%) in adolescents with addictive-like eating (Criscuolo et al., 2023).

1.1 Addictive-Like Eating

The notion of addictive-like eating started gaining public acceptance nearly sixty years ago – as evidenced by the emergence of groups such as Overeaters Anonymous in the 1960s. Scientific validation for the *food addiction* (FA) concept initially emerged from compelling

preclinical evidence showing that rodents with access to sugar displayed responses remarkably similar to drug dependence (Avena et al., 2008; Avena & Hoebel, 2003). Specifically, these studies demonstrated that access to ultra-processed foods (and their components like sugar or fat) could produce biological changes like reduced dopamine levels, as well as behavioral changes, such as compulsive use and withdrawal, like those observed with other addictive substances (see Wiss et al., 2017 for an excellent review).

However, the concept of FA has encountered considerable academic skepticism, primarily since eating is an intrinsically rewarding activity that is critical for survival (Finlayson, 2017; Fletcher & Kenny, 2018; Hebebrand & Gearhardt, 2021). Yet so is mating – but sex addiction is recognized in the International Classification of Diseases, 11th edition (World Health Organization, 2020) while FA is not. Alternative terms like “eating addiction” (Hebebrand et al., 2014) have been proposed, suggesting a behavioural-based rather than a substance-based addiction. However this perspective has been effectively refuted (see Meule & Gearhardt, 2014; Schulte et al., 2017). For example, Meule and Gearhardt (2014) compared diagnostic criteria for gambling disorder — the only officially recognized behavioral addiction in the *Diagnostic and Statistical Manual-5* (DSM-5) — to symptoms of FA. They found that despite several similarities (e.g., unsuccessful efforts to cut down), FA symptoms align more closely with a substance-use disorder, particularly due to the necessary consumption of a substance (hyper-palatable foods), and that the substance itself is what causes the addiction, not the behaviour of eating (Meule & Gearhardt, 2014). We have chosen to retain the term (FA) in this dissertation due to its wide-spread use in research and clinical settings. For example, while FA is not a recognized psychiatric diagnosis, it is already being used clinically to identify and provide

treatment for individuals who repeatedly attempt, yet fail, to reduce their food intake (e.g. Leary et al., 2021; Legendre & Bégin, 2023).

The *Yale Food Addiction Scale* (YFAS) was developed in 2009 to measure FA in clinical studies (Gearhardt et al., 2009a). The YFAS questions were designed to reflect the diagnostic criteria for a substance-use disorder in the DSM-IV (American Psychiatric Association, 2000). It is the only validated scale to measure FA, and offers a symptom count and presence or absence of a diagnosis (Gearhardt et al., 2009a). Symptoms outlined by the YFAS include continued intake despite negative consequences, unsuccessful attempts to stop intake, withdrawal, and tolerance (Gearhardt et al., 2009a). To fulfill the diagnostic criteria for FA, an individual must exhibit at least two symptoms, and identify that they experience significant impairment and/or distress, similar to the diagnostic requirements for any substance-use disorder in the DSM (Gearhardt et al., 2009a; see Appendix A).

The YFAS has acted as an important catalyst for clinical FA research. Such research also provided compelling evidence that FA is a distinct clinical condition with a psycho-behavioral profile that closely resembles conventional substance-use disorders, like alcohol- and tobacco-use disorder. That is, research has shown that ultra-processed and highly-palatable foods – when taken in large quantities by vulnerable individuals – can promote behaviours akin to conventional substance-use disorders, such as tolerance, escalation of intake, withdrawal, pronounced cravings, use despite harm, and relapse (e.g. (Avena et al., 2008; Bonder et al., 2018; Davis et al., 2011; Davis & Loxton, 2014; Gearhardt et al., 2009c, 2009a; Gearhardt & DiFeliceantonio, 2023; Meule et al., 2014; Pivarunas & Conner, 2015). In other words, susceptible individuals may persistently try and fail to limit their food intake, even when faced with emotional, social, or health-related repercussions (Meule & Gearhardt, 2019). For example,

some may resort to surgical interventions (e.g. gastric bypass surgery) in an attempt to decrease their food consumption, but over time, will still continue consuming caloric foods and gaining weight – further highlighting their diminished ability to self-control their intake (Conceição & Goldschmidt, 2019; de Lourdes et al., 2022; Pizato et al., 2017).

Neuroimaging research has demonstrated a correlation between YFAS scores, and activation of brain regions involved in conventional substance-use disorders. For example, individuals who score highly on the YFAS display activation patterns in reward-related brain regions indicative of diminished self-regulation (Gearhardt et al., 2011). Another study showed that an appetite suppressant that inhibits dopamine activity was less effective in adults with a YFAS diagnosis compared to controls (Davis et al., 2014). This implies altered dopamine signaling strength in adults with more severe FA symptoms, and parallels patterns observed in adults with other substance-use disorders (Davis et al., 2014). In addition, Davis and colleagues (2013) discovered that individuals with a YFAS diagnosis exhibited higher multi-locus genetic profile (MLGP) scores, which is indicative of increased dopamine signaling, and that reward-driven eating was the mediating factor in the association between MLGP scores and FA.

Accordingly, elevated scores on the YFAS correlate with a range of negative psychological symptoms, including depression, anxiety, symptoms of post-traumatic stress disorder, and heightened emotional reactivity (Bartschi & Greenwood, 2023; Criscuolo et al., 2023; da Silva Júnior et al., 2023; Delgado-Rodríguez et al., 2023; Escrivá-Martínez et al., 2023; Pivarunas & Conner, 2015; Tatsi et al., 2019). Similarly, there is high co-morbidity (50%) between substance-use disorders and psychiatric conditions like depression, anxiety, and personality disorders (Hillemacher et al., 2018; Volkow et al., 2019). Interestingly, individuals with a family history of addiction are more prone to be diagnosed with FA, and its high co-

occurrence rate with other substance-use disorders lends additional support to its categorization as an addiction disorder (Hoover et al., 2023).

The consumption of ultra-processed foods – such as hamburgers, French fries, candy bars, and packaged snacks – are most often associated with FA (da Silva Júnior et al., 2023; Delgado-Rodríguez et al., 2023; Taneri et al., 2022). Accordingly, individuals with FA typically have poorer diet quality, and consume fewer minimally processed foods such as fresh fruits and vegetables (Butt et al., 2023; da Silva Júnior et al., 2023). Although not everyone with FA has overweight or obesity, chronic and excessive consumption of calorie-dense foods inevitably leads to substantial weight gain over time – unless energy balance is negative, such as in professional athletes (Hauck et al., 2017). Precisely, while the prevalence of FA in the general population is about 5–15%, these numbers increase two- to three-fold among individuals with obesity (~25% prevalence) (Constant et al., 2020; Meule et al., 2017; Pedram et al., 2013; Pursey et al., 2014). FA scores and adiposity are also positively correlated (Pedram et al., 2013; Pursey et al., 2014, 2016). Correspondingly, only a small proportion of those with obesity have FA (Hauck et al., 2017; Meule et al., 2017). Therefore, it is incorrect to assume that all instances of overeating represent an addiction to food, in the same way that not everyone who regularly consumes alcohol develops alcohol-use disorder. Despite that many adults consume alcohol, only about 5–10% become dependent (Health Canada, 2014; National Institute on Alcohol Abuse and Alcoholism., 2021). As an example, a recent study comparing behavioural characteristics in individuals with obesity, uncontrolled eating, and substance-use disorders indicated significantly greater similarities between those with uncontrolled eating and substance-use disorders, compared to those with obesity (Vainik et al., 2020).

Importantly, although all addictions share common foundational symptoms and processes, they can manifest differently depending on the substance consumed (Fletcher & Kenny, 2018). Substance-use disorders represent a spectrum of comparable but distinct behaviors and neurological abnormalities (Volkow et al., 2017). For example, opioid withdrawal can be life-threatening (Wallace & Papp, 2017), whereas withdrawal from tobacco is characterized by irritability and anxiety (American Psychiatric Association, 2013). Despite these variances, it is indisputable that both substances trigger an addictive response and are difficult to abstain from when consumed regularly. Considering this, it should be evident that likewise, individuals struggling to abstain from hyperpalatable food – despite efforts to reduce their intake and negative consequences – exhibit similar, yet unique, behavioral and neurological abnormalities to those with conventional substance-use disorders.

1.1.1 Risk Factors

Individual differences have long been a focus in understanding susceptibility to substance abuse (e.g. Newcomb & Felix-Ortiz, 1992). Not surprisingly, these variations are also being studied to assess the risk for FA. For example, efforts to establish clinically meaningful ways to identify susceptibility to substance abuse has given rise to the notion of an ‘addictive personality’. This has driven the development of tools such as the Addiction Scale of the *Eysenck Personality Questionnaire*, which was developed by comparing individuals with drug addictions to controls on traits of impulsivity, negative affect, emotional reactivity, and anxiousness (Gossop & Eysenck, 1980). The scale has been validated in various substance-use disorders (e.g. cocaine, alcohol) (Pihl et al., 2000). It has also now been validated in those with FA (Davis, Levitan, et al., 2011), where individuals with FA exhibit higher rates of ‘addictive personality’ (Bonder et al., 2018; Finlayson, 2017; Miranda-Olivos et al., 2023; Pursey et al., 2019).

The ‘emotion regulation’ construct describes the extent to which individuals experience, manage, and express their range of emotions (Hofmann, Sawyer, Fang, & Asnaani, 2012). Dysregulation occurs when an individual cannot effectively control negative emotions or distress, often leading them to take any necessary action to avoid or cease feeling distressed (Thompson, 2019). Individuals who have difficulty coping with negative mood states are more likely to develop stress-induced disorders, such as addictions (Cheetham et al., 2010; Pivarunas & Conner, 2015). Therefore, emotion dysregulation is a risk factor for substance-use disorders (Okasha et al., 2021). Similarly, in a population sample of adults, emotion dysregulation was positively associated with YFAS symptom count (Pivarunas & Conner, 2015). Accordingly, it has been suggested that the overconsumption of highly-palatable foods serves as a self-medication method to alleviate dysphoric moods (Hirth et al., 2011; Ulrich-Lai, 2016).

It is important to mention that individual characteristics interact with environmental factors such as availability, cost, laws, and sociocultural factors, which can encourage or deter the overconsumption of addictive substances (Davis, 2013a). Therefore, the interplay of environmental influences and the tendency of individuals with FA to engage in emotionally-driven eating can promote a progressively worsening cycle, where a biological inability to control negative moods may intensify cravings for ultra-processed foods (Braden et al., 2018; Eisenstein et al., 2015; Frayn et al., 2018; Guerrero-Hreins et al., 2022). In our environment, where ultra-processed foods are superfluous, the urge to ameliorate negative feelings can be easily fulfilled, further exacerbating the condition (Eisenstein et al., 2015).

Lastly, impulsivity describes the inability to inhibit behavior, leading to premature, inappropriate, or risky actions (Davis, 2017; Fattore & Melis, 2016). Impulsivity manifests as a range of behaviors including heightened reward-seeking and risk-taking, and decreased

behavioral restraint and ability to delay gratification (Davis, 2017; Fattore & Melis, 2016). Impulsivity has also been implicated with a range of substance-use disorders (Kozak et al., 2019) and a greater likelihood of endorsing FA (Forsén Mantilla et al., 2022a, 2022b; Minhas, Murphy, Balodis, Acuff, et al., 2021; Wilson et al., 2021). For example, participants with FA exhibit a faster response to food cues than to neutral cues and show attentional hypervigilance towards food images compared to controls (Frayn et al., 2016). Similarly, women with FA exhibited reduced activity in the lateral orbitofrontal cortex – a brain region associated with inhibitory control – when consuming ultra-processed foods (e.g., a chocolate milkshake) (Gearhardt, 2011). Greater activation is associated with increased self-regulation, helping to curb excessive behaviors like compulsive substance use – including compulsive food intake (Hardee et al., 2020).

Research consistently indicates that men generally display greater impulsivity than women, leading them towards more risk-taking behaviours like gambling, reckless driving, and illicit substance use (see Fattore & Melis, 2016 for a review). Yet, overeating behaviours are more frequent in women (Escrivá-Martínez et al., 2023). This may be attributed to the fact that women, who tend to be more risk-averse, and as such, sensitive to the adverse consequences of risky actions (Fattore & Melis, 2016), may direct their impulsivity towards excessive consumption of highly palatable foods, rather than riskier behaviours like illicit substance use.

1.1.2 Sex-Related Differences

Generally, women progress more rapidly from casual substance use to addiction, experience more severe withdrawal symptoms, and are more prone to relapse following treatment than men (see Becker, 2016 for a review). Women are more likely than men to experience increased reactivity to food cues, more frequent and intense food cravings (especially

for sweet foods), and struggle more with regulating their cravings (Hallama et al., 2016; Imperatori et al., 2013; Weafer et al., 2017). Women also tend to experience heightened levels of depression, negative emotions, anger, and loneliness with their food cravings, and are more likely to be classified as emotional eaters (Guerrero-Hreins et al., 2022; Imperatori et al., 2013; Ravichandran et al., 2021). For example, women display enhanced activation of the superior temporal sulcus when making food choices, demonstrating a higher preference for high-calorie foods (particularly high in fats and refined carbohydrates) compared to men (Manippa et al., 2017; Schulte et al., 2015). Conversely, men show greater activation in the cingulate cortex and exhibit greater amygdala activation, areas involved in assessing the emotional and appetite-related aspects of eating (Anversa et al., 2021; Ruddock et al., 2015). Accordingly, most studies have shown that FA is more prevalent amongst women (Gallegos et al., 2023; Hauck et al., 2017, 2020; Pursey et al., 2014). However, variations in research findings exist, with some studies, including meta-analyses, reporting no gender differences, or even suggesting higher rates of FA in men (see Anversa et al., 2021 for a review).

Gonadal hormones also play a significant role in modulating overeating behaviors, by interacting with neurotransmitters and the gastrointestinal system (Klump, Culbert, O'Connor, et al., 2017; Klump et al., 2013, 2014; Ma et al., 2020). Such hormones vary between males and females, affecting eating and weight (Mikhail et al., 2021). For example, men typically have higher levels of androgens like testosterone, associated with reduced risk of obesity and diabetes in men, but increased risk in women (Mikhail et al., 2021). Conversely, women have higher levels of estrogens, such as estradiol and estrone, which generally suppress appetite but are associated with increased body weight and fat (see Vigil et al., 2022 for a review).

During the luteal phase of the menstrual cycle – characterized by high progesterone and low estrogen levels – food cravings and food-cue reactivity towards palatable foods, particularly sweets, increase (Klump, Culbert, & Sisk, 2017). Accordingly, women are at greatest risk for emotional and binge eating – both of which have high co-morbidity with FA – during the luteal phase of the menstrual cycle, with the lowest risk during the ovulatory (high estradiol) phase, where food intake is generally lower (Klump et al., 2013, 2014; Ma et al., 2020). Similarly, greater progesterone levels are associated with an increased likelihood of compulsive intake in both males and females (Ma et al., 2020). Interestingly, hormone-related changes during the menstrual cycle are estimated to account for as much as 24% of the variance in binge-eating episode frequency (Edler et al., 2007).

The lower incidence of binge eating in males has been partially attributed to the protective influence of testosterone (Klump, Culbert, & Sisk, 2017). Research on post-pubertal adolescent males have shown that elevated testosterone levels are linked to a reduced likelihood of binge eating, while lower testosterone levels increase rates of binge eating, even after controlling for variables like age, BMI, and symptoms of depression (Culbert et al., 2018). In contrast, the absence of testosterone exposure in the female brain during prenatal/perinatal periods, combined with the effects of ovarian hormones during puberty, has been associated with increased susceptibility to binge eating in women (Klump, Culbert, & Sisk, 2017). Interestingly, distinctions in binge eating tendencies are not observed before puberty, while a marked difference emerges from mid-to-late puberty and continues into adulthood (Culbert et al., 2018; Mikhail et al., 2021).

1.2 Distinguishing Food Addiction from Binge Eating Disorder

There exists an ongoing debate regarding whether FA represents a distinct and/or more severe form of the eating disorder with which it significantly overlaps, binge eating disorder (BED) (Paul et al., 2023). BED is characterized by recurring episodes of uncontrollable, rapid, and excessive food consumption ('binges') that occur irrespective of hunger and persist despite physical discomfort (American Psychiatric Association, 2013). These eating episodes are often conducted privately in a discrete amount of time, occur in response to negative emotional states, and result in ensuing feelings of distress, guilt, shame, and self-reproach (American Psychiatric Association, 2013). Regular episodes of binge eating can also happen in individuals who do not fulfill the criteria for an eating disorder as defined by the DSM (Derks et al., 2022).

About 42-87% of those with FA also meet criteria for BED, and both disorders encompass similar characteristics including impaired reward function, heightened cravings, emotional dysregulation, and impulsivity, with loss of control (LOC) over food intake being a defining feature (Butt et al., 2023; Escrivá-Martínez et al., 2023; Minhas, Murphy, Balodis, Acuff, et al., 2021; Praxedes et al., 2022). They are also both associated with other psychological disorders like attention-deficit hyperactive disorder, depression, and anxiety (Bartschi & Greenwood, 2023; da Silva Júnior et al., 2022; Hauck et al., 2020), and are more prevalent in women and in those with overweight and obesity (Gallegos et al., 2023). Both BED and FA involve the consumption of highly-palatable foods, including breads/pasta, sweets, high-fat meat items, and salty snacks (Burrows et al., 2017; Carvalho-Ferreira et al., 2019; Davis et al., 2014; Goodman et al., 2018; Pursey et al., 2015).

However, individuals with FA experience greater levels of compulsive overeating, psychological distress, impulsivity, emotional dysregulation, and poorer treatment outcomes

when compared to those with BED (Davis et al., 2011; Gearhardt et al., 2014; Legendre & Bégin, 2023). Furthermore, individuals meeting criteria for both disorders tend to binge more frequently than those only diagnosed with BED (Gearhardt et al., 2012). Some contend that BED is a *psycho-behavioral* disorder, since its DSM criteria only includes psychological and behavioral symptoms – such as episodes of bingeing in the absence of hunger, and cyclical feelings of depression, disgust, and guilt (American Psychiatric Association, 2013; Davis, 2016). Conversely, addictive-like eating develops from heightened neuro-sensitivity to palatable and rewarding foods, with symptoms resembling conventional substance-use disorders (e.g. tolerance, withdrawal) (Carter et al., 2016; Davis, 2016; Rogers, 2017).

One viewpoint is that BED could progressively evolve into a more severe condition marked by addictive-like behaviours (Davis, 2013c; Vainik et al., 2015) That is, the development of binge-eating behaviors – *viz.* increased LOC and frequency and size of binge episodes — may eventually trigger a severely compulsive and pathological condition that parallels other clinically-established addiction disorders. Comparable is research indicating that binge drinking does not necessarily warrant an alcohol-use disorder diagnosis, with the former requiring a brief intervention and the latter requiring intensive and possibly pharmacologic treatment (Rolland & Naassila, 2017).

However, addictive-like eating can also encompass alternative eating behaviors that do not represent a binge (Bonder et al., 2018; Meule, 2019; Romero et al., 2019; Schulte et al., 2016). For example, Davis et al. (2017) found no significant difference in FA symptoms between individuals with overweight/obesity with and without BED, suggesting that addictive-like eating is associated with elevated BMI and consistent overconsumption, but not with a particular pattern of overeating. Accordingly, clinical observations of compulsive overeating show

variation in patterns, including descriptions like “binge eating,” “constant overeating,” “hyperphagia,” “stuffing syndrome,” “nibbling,” and “between-meal snacking” (Carter & Jansen, 2012; Davis, 2016; Lane & Szabó, 2013; Reas et al., 2012). Likewise, some individuals with obesity and compulsive overeating do not report binge eating, but instead, exhibit prolonged, continuous, repetitive, and unstructured consumption of small amounts of food (Grilo et al., 2011; Lane & Szabó, 2013). This resembles the variety of consumption patterns seen in other substance-use disorders such as alcohol- and tobacco-use disorder (Bonder et al., 2018). For example, while some with alcohol-use disorder regularly binge drink, others show more continual drinking throughout the day (Hoggatt et al., 2015). This suggests that LOC over food intake can exist independently of the quantity of food consumed (Latner et al., 2014). Therefore, just as with other addiction disorders, overconsumption of food can manifest as patterns of intake that are highly compulsive but do not involve binge-like consumption.

1.3 Grazing

While bariatric surgery is a popular treatment option for obesity, a substantial proportion of patients report losing control of their eating following surgery (Ivezaj et al., 2018; Smith et al., 2019), and about a quarter regain all their weight over time due to recurring disordered eating patterns involving cravings and “snacking” (Constant et al., 2020; Ivezaj et al., 2019). This under-examined form of eating has been called (with objections) “grazing” (Saunders, 2004).

While numerous definitions of grazing have been proposed (see Pizato et al., 2017 for a systematic review), Conceico et al.’s (2017) definition is notable since it distinguishes a “compulsive” and “non-compulsive sub-type. Non-compulsive grazing – which has also been referred to as “nibbling” or “snacking” — is characterized by repetitive and distracted eating with minimal to no LOC (Conceição et al., 2014, 2017). It can often be planned (e.g. bringing a

snack to work), and lacks a repetitive element (Heriseanu, 2020; Heriseanu et al., 2021). This form of grazing is common and is not associated with increased BMI or other eating psychopathology such as binge eating (Conceição et al., 2014; Consolini Teodoro et al., 2021; Heriseanu, 2020; Reas et al., 2018). Therefore, non-compulsive grazing may serve as an adaptive and healthy eating strategy, particularly for those pursuing weight-loss treatment (Heriseanu, 2020; Heriseanu et al., 2021).

Conversely, compulsive grazing is characterized by LOC and involves unplanned, repetitive eating of small amounts of food over prolonged periods, regardless of hunger or satiety (Conceição et al., 2014). Negative emotions and food-related cravings are also associated with this behaviour (Lane & Szabó, 2013). Accordingly, compulsive grazing has been associated with psychological distress (Lane & Szabó, 2013); elevated eating disorder psychopathology and emotional eating (Conceição et al., 2017; de Lourdes et al., 2022); and diminished mental, physical, and overall health (Conceição et al., 2017; de Lourdes et al., 2022; Heriseanu et al., 2019; Reas et al., 2018; Spirou et al., 2023), when compared to individuals who do not engage in this behaviour.

Importantly, compulsive grazing and binge eating are similar in that they are both associated with feelings of LOC (Berner et al., 2020; Conceição et al., 2018). However, grazing is unique in its lack of discrete eating periods, slower pace, and smaller portions of food per intake (Heriseanu et al., 2017; Spirou et al., 2022, 2023). Some believe grazing represents a milder form of LOC eating than binge eating (Conceição et al., 2018; Wilson et al., 2021). For example, Conceicao et al. (2018) found that objective and subjective binge eating was associated with higher LOC than compulsive grazing.

Grazing research was inspired by the exigencies of bariatric surgery, where it has been identified as a clinically significant form of overeating associated with reduced treatment success for obesity (Kofman et al., 2010; Pizato et al., 2017; Saunders, 2004). For example, pre-bariatric surgery patients with compulsive grazing have increased levels of depression and anxiety, and experience reduced weight loss and increased weight regain post-surgery, compared to those without (Goodpaster et al., 2015; Heriseanu et al., 2019; Spirou et al., 2023).

Despite its prominence in bariatric surgery research, there is limited knowledge about grazing beyond this context, even though studies have indicated prevalence in those with obesity and BED (Consolini et al., 2021; Spirou et al., 2023). For example, grazing was prevalent in 33% of treatment-seeking patients with obesity, 23% in those with obesity in a community sample, and 68% in individuals with BED (Heriseanu et al., 2017). As such, Spirou et al. (2023) have suggested that compulsive grazing may contribute to weight issues in the general population. Notably, compulsive grazing is less prevalent than non-compulsive grazing in the general population, at 10% compared to 38%, respectively (Spirou et al., 2023). Heriseanu et al. (2023) recently found a significant positive association between grazing and impulsivity, attention-deficit hyperactivity disorder, cigarette smoking, and alcohol use. They concluded that both grazing and substance-use disorders may be underpinned by a predisposition to impulsivity, which is consistent with existing research showing a significant overlap between substance-use and other eating disorders (Heriseaneu et al., 2023).

Grazing remains largely understudied in the FA population. A PubMed search (December, 2023) of the terms “grazing” and “food addiction” produced six results focusing on their association — which included two reviews and one study authored by our research group. Legendré et al. (2022) examined the relationship between childhood trauma and maladaptive

eating behaviors in women with overweight or obesity seeking weight-loss treatment (Legendre et al., 2022). They found no significant relationship between childhood trauma and compulsive grazing, concluding that grazing may represent a less compulsive behaviour than binge eating and FA (Legendre et al., 2022). Alternatively, trauma is positively associated with FA and binge eating severity (Imperatori et al., 2016; Legendre et al., 2022) Carbone et al. (2023) found that individuals with BED exhibited binge eating, addictive-like eating, and/or grazing behaviours.

Our research in a non-clinical adult sample demonstrated a significant association between compulsive grazing and FA symptom severity (Bonder et al., 2018). Interestingly, after accounting for compulsive grazing in the statistical model, binge eating added no further unique variance to the symptom severity of FA (Bonder et al., 2018). One other study has looked at grazing in the context of FA in individuals with obesity attending an eating disorder clinic and found a positive association between grazing and FA severity (Legendre & Begin, 2023). However, they used a different grazing measure – the *Grazing Questionnaire* (Lane & Szabo, 2013) – which does not differentiate between a compulsive and non-compulsive subtype, but includes seven items, some specific to grazing with LOC. Therefore, a deeper understanding of compulsive grazing in the context of FA is lacking.

1.4 Research Aims and Objectives

This dissertation consists of two sequential studies, using a multi-method approach – a quantitative study followed by a qualitative study:

1. While our initial findings are promising (Bonder et al., 2018), they require further validation with a clinically-representative sample of individuals with obesity, as FA tends to be more prevalent and severe in such populations (Davis et al., 2017; Romer et al., 2019; Wiss, 2022). Additionally, a limitation of our earlier work was

that it primarily comprised normal-weight women, which restricted the exploration of weight and sex on the impact of FA severity and diagnosis. As such, the **first** study in this dissertation extended our earlier work (Bonder et al., 2018), with the primary purpose of replicating this work in a clinically-representative sample of those with obesity. We also wanted to explore potential moderating effects of weight and sex on the severity and frequency of FA, which we were unable to do in our previous study due to limitations in the sample. To the best of our knowledge, this is the first quantitative cross-sectional study that investigates the relationship between compulsive grazing and FA in a sample of those with obesity.

2. Since the current understanding of compulsive grazing primarily stems from the bariatric surgery population (Conceição et al., 2017), there is a gap in our understanding of grazing beyond this population, particularly through the perspectives of those afflicted by this condition. Specifically, only two studies have examined grazing qualitatively (Paterson et al., 2019; Zunker et al., 2012), both of which have not focused on *compulsive* grazing. Therefore, a qualitative study focusing on compulsive grazing is warranted to understand how this behaviour is conceptualized by those affected with it. As such, the primary purpose of the **second study** was to use Qualitative Description to understand how grazing is conceptualized from the perspectives of individuals who experience this eating pattern. We also wanted to understand where this behavior sits within a spectrum of compulsive overeating, particularly regarding its relationship to FA. Lastly, we wanted to gain further insight into how individuals

with obesity feel about FA as a *bona fide* condition. Using qualitative methodology helped gain insight into the attitudes and contextual factors influencing individuals' eating-related experiences, something that was not possible to do with quantitative research. To the best of our knowledge, this is the first study to qualitatively examine compulsive grazing in the context of compulsive overeaters, particularly those with FA.

CHAPTER 2: QUANTITATIVE STUDY

The following chapter has been accepted, pending revisions, in the journal, *Appetite*.
Heading and subheading numbering has been amended to match the placement of the chapter in this dissertation. Apart from that, the manuscript is identical to the one accepted.

**Grazing and food addiction: Associations between varied patterns of overconsumption and
addictive-like eating**

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Keywords: Food addiction, binge eating, compulsive grazing, overweight, obesity

2.1 Abstract

Background: Food addiction (FA) research has primarily concentrated on binge eating as a symptom of this condition. However, FA may encompass various overeating behaviours, including compulsive grazing – the repetitive consumption of small amounts of food with loss of control. This study extends our previous research by including a clinical sample to investigate whether compulsive grazing exists in a population with higher prevalence and severity of FA. It also examines whether weight or sex moderates the severity or frequency of FA. **Methods:** Adults between the ages of 20 and 50 years with obesity were recruited from a weight-management clinic (n=437). Participants completed an online questionnaire to assess various eating behaviours (binge eating, compulsive grazing, reward-based eating) and related personality measures (impulsivity, addictive personality traits). Multiple and logistic regression modelling were used with the Yale Food Addiction Scale symptom count and diagnosis as the dependent variables, respectively. A chi-square test of independence and an analysis of variance were used to determine sex differences. **Results:** Compulsive grazing was a significant factor in FA diagnosis and symptom severity, confirming earlier work. Binge eating was a significant factor in FA symptom severity. Additionally, females from a weight-management clinic sample were more likely to receive an FA diagnosis than females from the general population. No sex differences were found in males or in the symptom score option for FA. **Conclusions:** These findings suggest that various compulsive overeating patterns encompass FA. Individuals with obesity and co-morbid FA may require specialized treatments, which may benefit from sex-specific differentiations.

Word count: 250/280 words

Keywords: Food addiction, binge eating, grazing, obesity

2.2 Introduction

Individuals with food addiction (FA) – those who display hypersensitivity and decreased self-regulation towards food² – exhibit compulsive overeating behaviors that may not involve binge eating episodes but are still marked by a strong urge to overconsume (Bonder et al., 2018; Davis, 2014; Gearhardt et al., 2011). Such urges can manifest as compulsive grazing – viz. repetitive consumption of small amounts of food over an extended period of time with an inability to stop (Bonder et al., 2018; Conceição et al., 2014, 2017). This construct has attracted considerable clinical interest among post-operative bariatric patients, where it is viewed as a “high-risk behavior” for relapse (Conceição et al., 2014, 2018; Conceição & Goldschmidt, 2019). It should be emphasized that grazing episodes differ from prescribed small meals after bariatric surgery, where the choice of food and time of ingestion are planned and controlled based on hunger/satiety signals (Conceição et al., 2015).

Our recent work using a non-clinical sample of adults demonstrated a significant association between compulsive grazing and FA symptom severity (Bonder et al., 2018). However, after accounting for compulsive grazing in our analysis, no significant associations between binge eating and FA were found. This suggests that FA encompasses various patterns of overeating – a consumption profile similar to other addiction disorders (Bonder et al., 2018; Bonder & Davis, 2022; Volkow et al., 2017). For instance, individuals with alcohol dependence may engage in episodic binge drinking, or drink continuously throughout the day (Hoggatt et al., 2015). Similarly, individuals with nicotine dependence may be chain smokers, or intermittent smokers who smoke less than five cigarettes most days (Shiffman et al., 2012).

²Despite the ongoing debate surrounding the use of alternative labels like "eating disorder," we opted to use this term due to its widespread recognition in research and clinical reporting.

It is noteworthy that various patterns of overconsumption are seen in those with FA despite evidence that 42-87% of those with FA also satisfy criteria for BED, and that both disorders share symptomology, such as failed attempts to stop compulsive and impulsive overeating, and co-morbid mood disorders (Davis et al., 2017; Quilty et al., 2019). However, individuals with FA are more likely than those with BED to display impulsivity and elevated sensitivity to reward (particularly to hyper-palatable foods) (Davis & Carter, 2014). Similarly, our earlier study showed that reward-driven eating was highly correlated with FA severity – a behavior characterized by a preoccupation with food and lack of satiation (Epel et al., 2014). Elevated reward sensitivity has also been strongly linked to the onset of other substance-use disorders such as alcohol- and cocaine-use disorder, and nicotine dependence (Volkow et al., 2017, 2019).

Although our preliminary findings on grazing and FA are compelling, they would benefit from replication in a clinically-representative sample of those with obesity, given that FA tends to be more prevalent and severe in this population (Davis et al., 2017; Wiss, 2022). In addition, our previous study largely comprised normal-weight women, which limited the investigation of certain questions such as the influence of weight and sex on the presence and severity of FA. In the current study, we aimed to increase the representation of individuals with obesity in our sample by specifically recruiting from this population. Doing so would provide us with a greater weight range with which to investigate our research questions, and would also allow us to examine sex differences.

Our primary objective was to replicate our previous study with the addition of a clinical sample to understand whether compulsive grazing exists in a population with a greater and likely more severe form of FA. Our second objective was to examine whether sex, weight, or their

interaction affects the diagnostic frequency or symptom severity of FA. We speculated that adding a clinical sample would not alter the outcome that FA, like other addiction disorders, is characterized by various patterns of intake, including compulsive grazing. In line with previous findings (Davis et al., 2017; Wiss, 2022), we speculated that higher weight and being female would increase the severity and likelihood of having FA.

2.3 Methods

2.3.1 Sample and Recruitment

Participants with obesity ($BMI \geq 30$)³ were recruited from a physician-led medical weight-management clinic in Ontario. Eligibility criteria included: residing in North America for at least three years, fluent in English, aged 20 to 50 years⁴, and able to provide informed written consent. Exclusion criteria included: being pregnant or lactating, and/or having a physical disability or a previously diagnosed psychiatric disorder. Selective recruitment was used to target individuals with obesity, without specifically aiming for a balanced distribution of male and female participants. All clinic patients that met study criteria were solicited for participation.

If a patient matched the study criteria, a research assistant employed at the clinic sent the participant an email through a secure web-based platform that is compliant with Ontario's Personal Health Information Protection Act. The email included a brief explanation of the study and a link to the consent form and questionnaire booklet including all measures. The link directed participants to the secure web-based platform. Online written consent was provided in the form of an e-signature.

³ BMI has recently been criticized as an insufficient measure for diagnosing obesity (see Nutter et al., 2024). However, its widespread use in the fields of obesity and FA justified its inclusion in our study.

⁴ The age range was chosen to avoid hormonal influences (e.g. menopause) on weight.

2.3.2 Procedures

To limit bias due to order effects, questionnaire order was randomized across participants. Once completed, each participant received a \$15 e-stipend to compensate for their time. Participant's physical measures (height and most recent weight) were taken from their patient charts. The recorded measured weight of patients could have been as recent as a day old and as old as 6 months old. This study was approved by the host organization's research ethics board (#2017-041).

2.3.3 Measures

2.3.3.1 Food Addiction

The 25-item *Yale Food Addiction Scale* (YFAS) was used to assess FA. The scale reflects the seven symptoms of substance-dependence disorder in the DSM-IV (American Psychiatric Association, 2000), modified for eating behaviours (Gearhardt et al., 2009). A dichotomous (yes-no) diagnosis and continuous score (total symptom count) is provided. Symptom scores are given by summing the number of symptoms endorsed of the food-specific DSM-IV criteria, meaning scores can range from 0 to 7. Like in the DSM-IV, a 'diagnosis' of FA is indicated by the endorsement of three or more out of the seven symptoms and by the "clinically significant impairment" criterion being met in the past 12 months. Cronbach's α was 0.88.

2.3.3.2 Binge Eating

The 5-item bingeing subscale of the *Binge Eating Questionnaire* (BEQ) was used to assess the severity of binge eating (Halmi et al., 1981). Scoring is assessed on a 'yes'- 'no' dichotomous scale (scores can range from 0-5), with a higher score indicating more severe symptoms. Cronbach's α was 0.76.

2.3.3.3 Grazing

The 6-item compulsive grazing subscale of the *Rep(eat) Questionnaire* (Rep-Q) was used to assess compulsive grazing (Conceição et al., 2017). Items are scored on a 6-point Likert-type scale with items ranging from 0 (never) to 6 (usually every day). A higher average reflects more frequent grazing. Cronbach's α was 0.91.

2.3.3.4 Reward-Based Eating

The 9-item Reward-Based Eating Drive Scale (RED) was used to assess reward-based eating (Epel et al., 2014). Items are distributed on a 5-point Likert scale ranging from 0 (very false) to 4 (very true) and are averaged to comprise a total score. Cronbach's α was 0.90.

2.3.3.5 Impulsivity

The 30-item Barratt Impulsiveness Scale version 11 (BIS-11) was used to assess impulsivity (Patton et al., 1995). Items are scored on a 4-point self-report scale ranging from 1 (rarely/never) to 4 (almost always/always) and summed to obtain the total score. Cronbach's α was 0.80.

2.3.3.6 Addictive Personality Traits

The 32-item *Addiction Scale* of the *Eysenck Personality Questionnaire-Revised* (EPQ-R) was used to assess addictive personality traits (Eysenck & Eysenck, 1991). This scale was derived by differentiating items between those with substance-use disorders and controls at a probability level less than or equal to 0.001, from the 4 subscales of the Eysenck Personality Questionnaire-Revised: Extraversion-Introversion scale, Neuroticism, Psychoticism, and Lie. Answers are scored using a dichotomous 'yes'-'no' format, and are averaged to comprise a total score. Cronbach's α was 0.64.

2.3.3.7 Body Mass Index (BMI)

BMI was calculated by measuring weight (kg) and dividing it by a squared measurement of height (m). Weight and height were calculated using a standing scale with a height measuring device.

2.3.4 Analyses

All analyses for this study were conducted using the *Statistical Package for the Social Sciences* Version 25 for Windows (SPSS Inc., Chicago, IL, USA) at a two-tailed significance level of $\alpha = 0.05$. List-wise deletion was used to remove participants that were missing an entire questionnaire, had an incomplete YFAS questionnaire, or were missing their age, sex, or BMI. It was then determined that less than 3% of remaining data was missing. Missing data were imputed using expectation maximization for scale data (Dempster et al., 1977; Ghomrawi et al., 2011), and related observations in corresponding scales or subscales were used to impute binary data.

Our sample consisted of the sample from our original study (n=232; Bonder et al., 2018) and the newly recruited sample (n=205) of individuals with obesity (hereafter “pooled sample”). The original sample was collected from January to November 2017, and the weight-management clinic sample was collected from June 2018 to October 2020. Combining the samples increased the size and power of the dataset, which provided increased power to examine the influence of weight and sex/gender on the outcome variables. To create the pooled sample, the following steps were taken in consultation with a statistical consultant⁵ and statistical literature from peer-reviewed journals:

⁵The advisor is a professor at the host organization, with expertise in quantitative methods, particularly in relation to psychology and social science research.

1. Mean differences between the two samples were compared using a non-parametric test (data was not normally distributed) (Nachar, 2008), revealing significant differences in all predictor variables except grazing.
2. Since such differences were present, a ‘sample’ variable was created, and a multiple regression model was tested with sample x predictor interaction variables and all independent variables (Hayes & Montoya, 2017). None of the sample x predictor variables were significant in the model, so merging the two samples was deemed appropriate.
3. Subsequent analyses were conducted with the sample variable in the model. Sample was used as a moderating variable to account for unobserved variation (lurking variables) that could potentially exist between the two samples. All sample x predictor interaction variables were removed from the model (Engqvist, 2005).

A 2x2 chi-square test of independence was performed to examine the interaction between sex and sample on the frequency of FA diagnosis, and a two-way analysis of variance (ANOVA) was performed to examine the interaction between sex and sample on FA symptom score.

Hierarchical multiple and logistic regression modeling were used to examine the unique variance accounted for in the continuous (symptom count) and binary (diagnosis) FA dependent variables, respectively. In each model, grazing, binge eating, and reward-driven eating served as independent variables. Impulsivity, addictive personality traits, and BMI were added to the models as covariates. Hierarchical regression was chosen to determine the predictive power of our eating behavior variables of interest (grazing, binge eating, reward-driven eating), beyond participants’ demographic variables (sex and sample) and previously well-established covariates

of FA (impulsivity, addictive personality traits, BMI). The stepwise nature of hierarchical regression is useful in assessing the incremental validity of variables of interests over previously established covariates.

Accordingly, sex and sample were included as independent variables in Block 1. Based on previous research (Bonder et al., 2018; Stanley et al., 2022; Yilbas et al., 2022), BMI, impulsivity, and addictive personality traits were included as covariates in Block 2, followed by measures of overeating (grazing, binge eating, reward-driven eating) in Block 3. See Figure 1 for a visual presentation of our analysis.

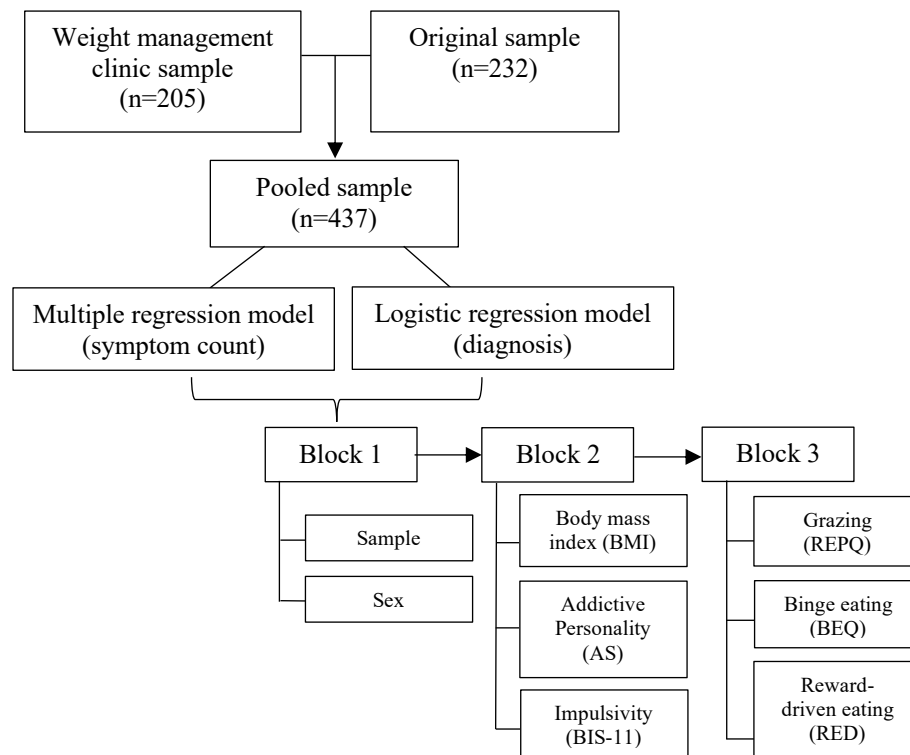


Fig 1. Hierarchal multiple and logistic regression models for the pooled sample.

2.4 Results

2.4.1 Descriptive Statistics

Table 1 presents the descriptive statistics for the weight-management clinic (n=205), original (n=232), and pooled (n=437) samples. Table 2 presents the descriptive statistics for the pooled sample, stratified by presence or no presence of FA. In the pooled sample, 20% met FA diagnosis (n=89; 76 female).

Table 1: *Descriptive statistics for the weight-management clinic, original, and pooled samples.*

	Weight-management clinic sample	Original sample	Pooled Sample
Sex (n, %)			
Male	42 (20%)	75 (32%)	120 (27%)
Female	163 (80%)	157 (68%)	317 (73%)
BMI (μ)	39.1	25.3	32.0
Age (μ)	43.1	24.6	33.4
Race (n, %)			
White	137 (67%)	95 (41%)	232 (53%)
African Descent	25 (12%)	38 (16%)	63 (14%)
East Indian	10 (5%)	40 (17%)	50 (11%)
East Asian	-	19 (8%)	21 (5%)
Hispanic/Latino	12 (6%)	-	12 (3%)
Other	18 (9%)		44 (21%)
Missing	3 (1.5%)	28 (12%)	15 (3%)
Presence of Food Addiction diagnosis (n, %)	58 (28%)	31 (15%)	89 (43%)

Table 2: *Descriptive statistics for the pooled sample (n=437), stratified by presence or absence of food addiction*

	Presence of food addiction	Absence of food addiction
Sex (n, %)		
Male	13 (3%)	107 (24%)
Female	76 (17%)	241 (55%)
BMI (μ , kg/m ²)	35.5	31.0
Age (μ , years)	35.9	32.8
Race (n, %)		
White	48 (11%)	183 (42%)
African Descent	16 (4%)	47 (11%)
East Indian	-	42 (10%)
East Asian	-	19 (4%)
Other		42 (12%)

Missing	24 (27%)	(3%)
	1 (0.2%)	

2.4.2 Bivariate correlation coefficients

Table 3 presents the means, standard deviations, and the bivariate correlation coefficients among the model variables for the pooled sample (n=437). Table 4 presents the means and standard deviations for the model variables by sample.

Table 3: Means, standard deviations, and correlation coefficients for the model variables.

Variable	$\bar{x}$	SD	1	2	3	4	5	6	7
1. AS	13.65	5.50	–	0.53**	0.18**	0.43**	0.45**	0.43**	0.45**
2. BIS-11	64.27	10.85	0.53**	–	0.15**	0.44**	0.47**	0.47**	0.45**
3. BMI	31.98	9.43	0.18**	0.15**	–	0.26**	0.24*	0.12**	0.25**
4. BEQ	2.05	1.45	0.43**	0.44**	0.26**	–	0.67**	0.57**	0.59**
5. RED	1.74	1.02	0.45**	0.47**	0.24**	0.67**	–	0.70**	0.68**
6. REPQ	1.75	1.51	0.43**	0.47**	0.12**	0.57**	0.70**	–	0.72**
7. YFAS ¹	2.97	1.91	0.45**	0.45**	0.25**	0.59**	0.68**	0.72**	–

SD: Standard deviation; AS: Addiction Scale; BEQ: Binge Eating Questionnaire; BIS-11: Barratt Impulsiveness Scale-11; BMI: body mass index; RED: Reward-Based Eating Drive Scale; REPQ: Repetitive Eating Questionnaire; YFAS: Yale Food Addiction Scale.

* = $p < 0.05$.

** = $p < 0.01$.

¹Symptom scores reported.

Table 4: Means and standard deviations by sample.

Variable	<u>Weight-management clinic</u> <u>sample</u>		<u>Original sample</u>	
	$\bar{x}$	<u>SD</u>	$\bar{x}$	<u>SD</u>
1. AS	14.4	5.3	13.0	5.5
2. BIS-11	65.5	11.4	63.1	10.2
3. BMI	39.1	8.1	25.3	4.4
4. BEQ	2.5	1.4	1.6	1.4
5. RED	2.0	1.0	1.5	1.0
6. REPQ	1.8	1.5	1.7	1.5
7. YFAS ¹	3.4	1.9	2.6	1.8

SD: Standard deviation; AS: Addiction Scale; BEQ: Binge Eating Questionnaire; BIS-11: Barratt Impulsiveness Scale-11; BMI: body mass index; RED: Reward-Based Eating Drive Scale; REPQ: Repetitive Eating Questionnaire; YFAS: Yale Food Addiction Scale.

¹Symptom scores reported.

2.4.3 Sex and Sample Interactions

2.4.3.1 Chi-Square Test of Independence

The interaction between sex and sample was significant for the total sample, $\chi^2(1, N = 427) = 14.06, p < .001$. Results indicated that females from the weight-management clinic sample (33%) were significantly more likely to have an FA diagnosis than females in the original sample (16%), $\chi^2(1, N = 317) = 12.10, p < .001$. No differences were found between the male samples.

2.4.3.2 Analysis of Variance

In the two-way ANOVA, the interaction between Sex and Sample on FA symptom scores was not statistically significant.

2.4.4 Multiple Regression Analyses

Greater symptom severity was associated with higher addictive personality traits, binge eating, reward-driven eating, and compulsive grazing, with compulsive grazing making the largest unique contribution to the model, followed by reward-driven eating, binge eating, and addictive-personality traits, respectively. In other words, individuals with higher addictive personality traits, and who are more likely to engage in binge eating, reward-driven eating, and compulsive grazing, may be at a greater risk of developing FA. Sample and Sex were both not significant in the final model. A summary of the results is presented in Table 5. The R^2 of the final model was 0.61.

Table 5: Regression coefficients and VIF for the multiple regression analysis with YFAS symptom score as the dependent variable, with sample variable.

<i>Model 1</i>					
Variable	β	Standardized SE	<i>t</i>	<i>p</i>	VIF
Sample	.21	.36	4.27	<0.0001	1.02
Sex	.06	.47	1.34	.18	1.02

Model 2

Variable	β	Standardized SE	t	p	VIF
Sample	0.06	0.46	0.96	0.34	2.21
Sex	0.03	0.40	0.62	0.54	1.06
AS	0.28	0.00	5.58	<0.0001	1.45
BIS-11	0.29	0.00	5.99	<0.0001	1.40
BMI	0.10	0.00	1.66	0.10	2.22

Model 3

Variable	β	Standardized SE	t	p	VIF
Sample	0.16	0.36	0.91	0.36	2.45
Sex	-0.18	0.31	-1.31	0.19	1.09
AS	0.03	0.00	2.56	0.01	1.57
BIS-11	0.01	0.00	0.89	0.38	1.62
BMI	0.01	0.00	1.06	0.29	2.24
BEQ	0.18	0.01	3.00	0.003	2.32
RED	0.39	0.17	4.29	<0.0001	3.02
REPQ	0.54	0.05	9.27	<0.0001	3.16

AS: Addiction Scale; BEQ: Binge Eating Questionnaire; BIS-11: Barratt Impulsiveness Scale-11; BMI: body mass index; RED: Reward-Based Eating Drive Scale; REPQ: Repetitive Eating Questionnaire; YFAS: Yale Food Addiction Scale.

β : standardized coefficient; SE: standard error; VIF: variance inflation factor.

Model 1 $R^2 = 0.05$.

Model 2 $R^2 = 0.30$.

Model 3 $R^2 = 0.61$.

2.4.5 Logistic regression analyses

Table 6 presents the logistic regression analyses for the pooled sample. Grazing and reward-based eating reached statistical significance, with the overall model providing a moderate fit in predicting an FA diagnosis (Nagelkerke pseudo $R^2 = 0.55$, $\chi^2 = 183.76$). In other words, with each 1-point increase in compulsive grazing and reward-driven eating score, an individual is 1.6 and 1.36 times more likely to have FA, respectively. Sample and sex were both not significant in the final model.

Table 6: Regression coefficients and odds ratios for the logistic regression analysis with YFAS diagnosis as the dependent variable, for the pooled sample.

Model 1							
Variable	Coefficient	SE	Wald	p	OR	95% CI for OR	
						Lower	Upper
Sample	0.86	0.26	11.25	0.001	2.36	1.43	3.89
Sex	0.89	0.34	7.00	0.01	2.44	1.26	4.72
Model 2							
95% CI for OR							

Variable	Coefficient	SE	Wald	<i>p</i>	OR	Lower	Upper
Sample	0.35	0.39	0.81	0.34	1.42	0.66	3.04
Sex	0.82	0.36	5.14	0.02	2.28	1.11	4.64
AS	0.08	0.03	6.41	0.01	1.08	1.02	1.15
BIS-11	0.07	0.02	22.81	<0.001	1.08	1.04	1.11
BMI	0.02	0.02	1.40	0.24	1.02	0.99	1.06

Model 3

Variable	Coefficient	SE	Wald	<i>p</i>	OR	95% CI for OR	
						Lower	Upper
Sample	0.46	0.48	0.93	0.34	1.29	0.62	4.08
Sex	0.47	0.42	1.29	0.26	1.92	0.71	3.64
AS	0.03	0.04	0.70	0.40	1.03	0.96	1.11
BIS-11	0.02	0.02	1.01	0.31	1.01	0.98	1.05
BMI	0.02	0.02	0.63	0.43	1.01	0.97	1.06
BEQ	0.25	0.17	2.24	0.13	1.11	0.93	1.78
RED	0.62	0.27	5.45	0.02	1.36	1.11	3.13
REPQ ¹	0.69	0.14	23.07	<0.001	1.60	1.51	2.65

AS: Addiction Scale; BEQ: Binge Eating Questionnaire; BIS-11: Barratt Impulsiveness Scale-11; BMI: body mass index; RED: Reward-Based Eating Drive Scale; REPQ: Repetitive Eating Questionnaire; YFAS: Yale Food Addiction Scale.

SE: standard error; OR: odds ratio; CI: confidence interval.

Model 1 Nagelkerke $R^2 = 0.08$, $\chi^2 = 22.54$.

Model 2 Nagelkerke $R^2 = 0.29$, $\chi^2 = 87.62$.

Model 3 Nagelkerke $R^2 = 0.55$, $\chi^2 = 183.76$.

¹Only the compulsive subscale of the REPQ added significance in the model. As such, the non-compulsive subscale was removed. Results not shown in table.

Since only 13 of 120 males had FA – and to improve the power of the analysis – the final logistic regression model was re-run without the addictive personality and impulsivity variables as they were not significant in the initial analysis. Results remained similar when these variables were removed (Nagelkerke $R^2 = 0.55$, $\chi^2 = 181.09$), with only compulsive grazing ($p < 0.0001$, OR = 2.09) and reward-driven eating ($p = 0.01$, OR = 1.94) remaining significant.

2.5 Discussion

The current study extends our previous research by including individuals with obesity from a medically regulated weight-management clinic. A larger sample with greater diversity enabled us to examine weight and sex influences on the outcome variables. Females from the weight-management clinic sample were more likely to have an FA diagnosis than those from the non-clinical sample. In the multiple regression model, compulsive grazing had the strongest

association with FA, followed by reward-driven eating, binge eating, and addictive personality, respectively. Compulsive grazing was the most significant variable in the logistic regression model, followed by reward-driven eating.

Females from the weight-management clinic had significantly greater FA diagnoses than females in the general population, but no differences were found in males. The ANOVA – which examined sex differences for the FA symptom score – produced null results. Similarly, sex was only significant in the first logistic regression model, and not significant in the multiple regression models. This does not dismiss the significance of sex as a predictor of FA, but simply suggests the presence of more salient variables, like compulsive grazing, which was the strongest predictor in both final regression models. The higher prevalence of FA diagnosis among weight-management clinic females aligns with earlier findings showing greater rates of FA in females with elevated BMI (Davis et al., 2017; Wiss, 2022). Generally, women have heightened sensitivity to addictive substances (including hyper-palatable foods), due to factors including hormone variation which influences eating, mood, and reward processing (Davis & Bonder, 2022; Legget et al., 2023). Women are also more risk-averse than males (Ferrín, 2022), which may explain their preference for hyper-palatable foods over other illicit substances. Accordingly, females are more likely to experience emotion dysregulation towards food (Ravichandran et al., 2021). If potential sex-based distinctions do exist, this can inform prevention and treatment of compulsive overeating, particularly since women experience greater food cravings and emotional eating (Ravichandran et al., 2021). This would be especially pertinent since women are currently less likely to complete weight-management treatments, do not respond as effectively to pharmacological treatments, and typically lose less weight and have a harder time maintaining weight loss than men (Hallam et al., 2016; Ravichandran et al., 2021).

It was unexpected that BMI and Sample (clinical weight-management patient versus not) were not significant in our final models, despite their known association with FA (Davis et al., 2017; Wiss, 2022). However, as with the sex variable, this does not dismiss their significance as correlates of FA, but suggests the presence of more salient ones. In other words, the data show that while these variables significantly influence the model when they are the only factors considered, once more powerful correlates are introduced, their impact diminishes and they no longer contribute significant unique variance to the dependent variables (FA symptom count and diagnosis). This is consistent with existing literature which suggests that the degree of compulsiveness, rather than volume of food consumed (which can lead to excess weight), better predicts addictive-like eating (Conceição et al., 2018; Lacroix & von Ranson, 2020). Similarly, clinicians have noted that LOC and attempts to ameliorate negative feelings are more predictive of an alcohol-use disorder than amount consumed (Benton, 2009).

The significance of addictive personality traits and reward-driven eating reinforces our previous work – and that of other studies – which have shown that FA resembles a substance-use disorder (Bonder et al., 2018; Burrows et al., 2017; Gearhardt et al., 2011; Meule & Gearhardt, 2019). The addictive personality scale has been associated with other substance-use disorders such as tobacco- and alcohol-use disorder (Loureiro et al., 2017; Papachristou et al., 2016). Therefore, individuals with heightened addictive personality traits may be at a greater risk of developing conventional substance-use disorders, and a harmful relationship with food. It is also well established that the reward pathway is involved in addiction development (Volkow et al., 2019). Accordingly, individuals with FA are more likely to engage in hedonically-driven eating and exhibit increased reward sensitivity (Davis, 2013b; Loxton & Tipman, 2016). This supports

the idea that FA is better conceptualized as an addictive process than an eating disorder (Davis, 2017; Hone-Blanchet & Fecteau, 2014).

The significance of compulsive grazing in both final models is consistent with our previous study, and other research showing that individuals with FA are more likely to compulsively graze and overindulge on "snack foods" such as chips, pastries, and ice cream (Bonder et al., 2018; Davis et al., 2014; Legendre & Bégin, 2023). Certain vulnerable individuals – with high reward sensitivity and poor impulse control – may experience a growing need to consume increased amounts of hyper-palatable food over time (Davis et al., 2017; Wiss, 2022). This helps explain how casual snacking can become compulsive grazing over time and aligns with the ‘escalation of intake’ requirement for the diagnosis of substance-use disorder (American Psychiatric Association, 2013). For example, intermittent smoking can develop into nicotine dependence for some but not others (Shiffman et al., 2012).

Grazing has been previously conceptualized on the milder end of a compulsive overeating continuum, compared to other eating patterns such as binge eating (Conceição et al., 2018; Wilson et al., 2021). However, our findings indicate that grazing is associated with an FA diagnosis, which involves experiencing *significant* distress and difficulties in engaging in activities of daily living (e.g., work, social interactions, etc.). Accordingly, compulsive grazing has been associated with emotional eating, weight concern, and emotion dysregulation (Conceição et al., 2018; Heriseanu et al., 2019; Spirou et al., 2022). Therefore, regardless of its position on an overeating spectrum, compulsive grazing should still be viewed as a clinically significant and potentially detrimental form of overeating.

Binge eating was significant in the multiple but not logistic regression model, contrasting our previous results where binge eating was not significant. First, the lack of significance of

binge eating in the initial sample may have occurred due to low variability in binge eating scores, which would have reduced the probability of finding a statistically significant result. For example, the mean binge eating score in the weight-management sample was 2.5, compared to 1.6 in the initial sample. Second, it is difficult to explain why binge eating was significant in the multiple but not logistic regression model. However, the lack of significance of binge eating may reflect the lower power in the logistic regression analyses as compared to the multiple regression models (Astivia et al., 2019). Another explanation could be that participants were recruited from a weight-management clinic that promotes a low-calorie meal plan with small meals and snacks, potentially leading to reduced binge eating reporting. In the pooled sample, FA diagnoses predominantly came from the weight-management sample, with twice as many diagnoses compared to the initial sample. Although these participants were assured through study documents that their responses would remain confidential and not shared with the clinic, responder bias may have occurred in that participants underreported their binge eating behaviours to show alignment with their prescribed dietary plan.

Nevertheless, the significance of binge eating in the multiple regression model reinforces previous research indicating an overlap between binge eating and FA (Carter et al., 2019; Davis, 2013c; Paul et al., 2023). Importantly, it also indicates that binge eating is one pattern (but not the only) of compulsive overeating in FA, as we have previously suggested (Bonder et al., 2018). The significance of grazing, but not binge eating, in the final logistic regression suggests that viewing overeating as a spectrum from compulsive grazing to binge eating to food addiction may suit some individuals but not all. Some with FA may never binge eat, or have co-occurring compulsive grazing and binge eating. However, the cross-sectional nature of our study hinders our ability to determine whether grazing develops into binge eating over time.

The heterogeneity in eating patterns in FA underscores similarities between addictive-like overeating and other substance-use disorders, like alcohol and nicotine dependence, where binge-like consumption does not always indicate a diagnosis. Recognizing this is critical given the ineffectiveness of current lifestyle interventions in combating the obesity epidemic, which is currently the leading cause of premature mortality worldwide (World Health Organization, 2021). Treating FA like all other addiction disorders could help develop novel prevention strategies and treatments for those afflicted.

Lastly, the difference in findings in our analyses between the symptom-score option and diagnosis underscores the clinical differences between the two YFAS scoring options (see Bonder et al., 2018). While the symptom score provides insight into the spectrum of compulsive eating behaviours, and may identify FA risk, it does not capture addiction severity. To receive a YFAS diagnosis, individuals must indicate significant distress and reduced quality of life. Given that some behaviors measured by the YFAS may be normative in today's overabundant food environment (e.g. having cravings, worrying about a healthy diet), the symptom score alone does not indicate an addiction to food. This emphasizes the need for differentiated FA management approaches for those with and without the clinical impairment criterion; the latter may be labeled as 'at risk' and require further assessment (Whatnall et al., 2022; Wiss & Brewerton, 2020).

2.5.1 Strengths, Limitations, and Future Directions

A major strength of this study is its relatively large clinical sample. However, our sample comprised individuals seeking medical help for their weight issues, which may not be representative of all individuals with overweight and obesity. In addition, our sample remained predominantly female, suggesting the need for a more balanced representation of sex in future

research. Importantly, we also caution researchers from using the two YFAS scoring options interchangeably.

Despite being labelled a high-risk eating behaviour, grazing remains understudied in FA research. There is also a relative absence of qualitative studies investigating grazing in the context of FA. We therefore encourage researchers to further explore compulsive grazing as a variable in FA. Future studies should also aim to understand the impact of compulsive grazing on individuals with FA from their own perspectives.

2.6 Conclusions

The current study confirmed our earlier work, showing that compulsive grazing was a significant factor in the diagnosis and severity of FA. Results also indicated that binge eating significantly influences the severity of FA. These findings suggest that BED and FA likely represent idiosyncratic diagnoses, since there are various eating patterns that encompass addictive-like eating. They also suggest that compulsive tendencies towards food in any form may be a marker of addictive-like eating which warrants clinical intervention.

We also found that females from a weight-management clinic sample were more likely to receive an FA diagnosis than females from the general population. No sex differences were observed in males, or in the symptom score option for FA. This may suggest that women are more affected by the distress associated with FA, and are more inclined to report it. Sex-specific adaptations may be warranted for FA treatment, particularly since women generally have less success with weight-management programs already (Ravichandran et al., 2021).

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CHAPTER 3: QUALITATIVE STUDY

3.1 Introduction

While the majority of research to date in the area of FA has used quantitative approaches, it has been argued that qualitative research may be helpful in clarifying the experiences of those who have an addictive relationship with food, and concurrently, aid in developing an agreed-upon definition of addictive-like eating (Lacroix et al., 2018; Paterson et al., 2019). A PubMed, Web of Science, and Google Scholar search (in November 2023) revealed only 12 qualitative studies on FA (as defined by the YFAS), or addictive-like eating, in samples with and without FA – one of which is from our lab (Collins et al., 2021; Curtis & Davis, 2014; Işık et al., 2022; Lacroix et al., 2019; Malika et al., 2015; Morelife et al., 2019; Paterson et al., 2019; Ruddock et al., 2015; Schiestl et al., 2022; Wattick et al., 2023; Wehling & Lusher, 2019; Zevin et al., 2019). This gap in research is significant, given the contention by some scholars that the distress from compulsive overeating is not comparable to drug abuse, challenging its classification as an addiction disorder (Rogers, 2017).

Existing qualitative research has reinforced behavioral parallels between FA and traditional substance-use disorders. For example, individuals with FA report LOC when eating, escalation of intake, and persistent use despite adverse consequences (Curtis & Davis, 2014; Ruddock et al., 2015; Schiestl et al., 2022). They also report eating in response to negative emotions, leading to guilt and cyclical overeating (Collins et al., 2021; Wattick et al., 2023; Wehling & Lusher, 2019). Similarly, negative emotions are associated with increased drinking and risk of developing alcohol-use disorder (Blevins et al., 2016; Creswell et al., 2013).

Interestingly, the term “blacking out” has been used by FA participants to describe their eating

episodes (Wattick et al., 2023) – a phrase commonly associated with excessive alcohol use or taking other potent drugs like heroin (Wombacher, 2018).

Our team’s previous qualitative investigation found that individuals with BED and obesity often use drug-related language (e.g. sugar is “[their] drug”, and “getting high”) to describe their eating behaviours and related emotions (Curtis & Davis, 2014; Davis, 2017). This research also indicated that addictive-like eating is triggered by highly-processed foods (Curtis & Davis, 2014; Davis, 2017). Subsequent studies have also found that the consumption of highly-processed foods (e.g. candy, chips, meat, and cheese), as opposed to minimally-processed ones, triggers addictive-like eating (Paterson et al., 2019; Schiestl et al., 2022). These findings are important as they suggest that the characteristics of the food initiate FA, rather than the act of eating. This supports the prevailing notion that FA is akin to a substance-use rather than a behavioural addiction like gambling or gaming (Lacroix et al., 2018; Leehr et al., 2015; Schulte et al., 2017).

Some qualitative studies have explored how individuals perceive their addiction to food, and whether they agree with the label. Malika et al. (2015) found that most participants acknowledge FA as a substance-use disorder, and perceived the cravings associated with FA were seen as compulsive and problematic (Malika et al., 2015). Other studies have indicated that individuals recognize FA as a cause of their obesity, and that using the FA label helped them understand their eating behaviours and LOC over food (Cullen et al., 2017; Işık et al., 2022; Ruddock et al., 2015; Zevin et al., 2019). However, some participants have rejected the FA label, contending that conventional addictions have more severe and immediate impacts and repercussions than habitual compulsive overeating (Curtis & Davis, 2014).

Recently, Schiestl et al., (2022) investigated how individuals with FA interpret the YFAS, and whether their interpretations align with the DSM-5 criteria for substance-use disorders. They found that participants largely agreed with the scale's items and recognized the symptoms of substance-use disorders in themselves. However, they also found that the YFAS did not capture key aspects of addictive-like eating, such as using food to cope with stress and/or negative emotions. Accordingly, Paterson et al. (2019) suggested that participants' experiences and conceptualizations should be integrated into the definition of FA.

3.1.1 Qualitative Grazing Research

Several qualitative FA studies have found that snack foods – such as sweets, sugary beverages, chips, chocolate, and pastries – are viewed as the most addictive by participants (Collins et al., 2021; Curtis & Davis, 2014; Işık et al., 2022; Ruddock et al., 2015; Schiestl et al., 2022). However, these studies did not explore the specific eating patterns associated with these foods, nor have they investigated the concept of 'grazing' to describe how these foods are typically consumed.

Only two qualitative studies have studied grazing: one in the context of bariatric-surgery patients, and the other in individuals with FA (Paterson et al., 2019; Zunker et al., 2012). Paterson et al. (2019) found that FA involves persistent and uncontrollable urges to overeat energy-dense foods, either through binge eating or grazing throughout the day. However, they did not provide direct quotes from participants about these eating patterns, nor did they describe how binge eating and grazing differ from the participants' perspectives. They also did not clarify whether the grazing experienced by their participants was compulsive or not (although one can likely assume it was given the FA context). To understand how post-bariatric-surgery patients perceive grazing, Zunker et al. (2012) used the *Nominal Group Technique* – a method of data collection involving a highly-structured focus group, where participants write their responses on

a flip chart using words and short phrases. Participants only responded to the question, “What is grazing?” Findings supported the definition that grazing is associated with consuming small portions of food over time. Interestingly, participants did not view grazing as a compulsive behaviour, but rather, as a healthy, mindful, eating pattern. This is not surprising since post-bariatric surgery patients are often instructed to consume smaller meals and snacks (Conceição et al., 2017). As such, we can assume they described the non-compulsive, rather than compulsive, subtype of grazing.

Therefore, there is a lack of qualitative research on compulsive grazing from the viewpoint of individuals who experience this eating pattern, particularly in the context of FA. This lack exists despite evidence suggesting that grazing is a significant eating pattern amongst individuals with FA (Bonder et al., 2018; Paterson et al., 2019; Wilson et al., 2021).

3.1.2 Purpose of the Current Study

Our quantitative research found that compulsive grazing was a significant predictor of FA. While these findings are notable, the current grazing questionnaire was developed by bariatric-surgery experts, rather than compulsive overeating specialists, or by individuals with lived experience of this behaviour. Although Paterson et al. (2019) found that FA involves episodes of binge eating or grazing throughout the day, the main purpose of their study was to discern if FA better represents an eating- or substance-based addiction. As such, they did not provide any descriptions of how these eating patterns were conceptualized by participants, the distinctions between binge eating and grazing, or concentrate on the construct of compulsive grazing specifically (versus non-compulsive). We believe that an important step forward is to qualitatively understand how individuals with obesity, who have compulsive overeating tendencies, view their compulsive grazing.

Davis (2013) proposed a transdiagnostic spectrum of compulsive overeating, which ranges in severity from mild instances of occasional overeating, to frequent hedonic overeating, binge eating, BED, and ending in extreme cases of FA. This seminal paper has been cited 181 times, with many reinforcing this progression. Presently, this spectrum of overeating is the predominant framework of conceptualizing FA in research. Two previous quantitative studies have suggested that grazing may represent a milder form of compulsive overeating and may sit at the lower end of this continuum (Teodoro et al., 2021; Wilson et al., 2021). While this conceptualization may be accurate in some instances, others may have FA but not binge eat, as we have shown in our previous studies (Bonder et al., 2018; Bonder et al., under review). The differences between binge eating and grazing are yet to be explored qualitatively. Therefore, we also aimed to understand where grazing fits within the spectrum of problematic overeating, particularly whether those with FA can exhibit multiple overeating behaviours (e.g. binge eating and compulsive grazing) concurrently, and under what circumstances they would be more likely to engage in one pattern versus the other.

Lastly, since only 12 studies have previously examined addictive-like eating qualitatively, we also felt it was important to understand personal perspectives on FA, and whether our participants consider it a *bona fide* condition. Placing emphasis on the experiences of individuals with addictive-like eating can offer insight into the distress experienced by them. Given the considerable overlap between BED and FA, we found it important to speak with individuals exhibiting a range of compulsive overeating behaviours, including compulsive grazing, and/or BED, and/or FA (this decision is further discussed in the Methods section).

In summary, the purpose of this study was three-fold: 1) to understand how individuals with overweight and obesity perceive compulsive grazing; 2) to understand where compulsive

grazing fits on the spectrum of overeating, particularly in relation to FA; and 3) to assess if the concept of FA aligns with the experiences of participants in this study. To the best of our knowledge, we are the first study to qualitatively examine how compulsive grazing is conceptualized in individuals with obesity, particularly through the lens of addictive-like eating.

3.2 Methods

3.2.1 Qualitative Description Background

The recent increase in health-science-related qualitative research has led to the emergence of various overlapping methodologies, which are often difficult to differentiate (Marks et al., 2022; Morse, 2020). This misidentification leads to an inaccurate representation of methodologies used, and difficulties when interpreting and comparing research findings (Sandelowski, 2010). To address this issue, Qualitative Description (QD) has emerged as a useful methodology. Its purpose is to provide straightforward and comprehensive descriptions of events or phenomena (Sandelowski, 2010). QD is frequently used in health-science qualitative studies, particularly among novice researchers, even though it is not always labeled accordingly (Colorafi & Evans, 2016; Nayar & Stanley, 2014).

A systematic review by Kim et al. (2017) found only seven studies that described QD design (Milne & Oberle, 2005; Neergaard et al., 2009; Sandelowski, 2000, 2010; Sullivan-Bolyai et al., 2005; Vaismoradi et al., 2013; Willis et al., 2016). My own search (August 2023) yielded 11 more papers (Colorafi & Evans, 2016; Doyle et al., 2020; Ghorbani & Matourypour, 2020; Lambert & Lambert, 2013; Magilvy & Thomas, 2009; Nayar & Stanley, 2014; Sullivan-Bolyai & Bova, 2021; Tamayo et al., 2020; Turale, 2020; Varpio et al., 2015). Overall, these papers clarify that the defining features of QD are the use of less inference and theory than in other popular qualitative approaches such as phenomenology and grounded theory (Tamayo et al.,

2020). This approach allows researchers to stay closer to the ideas introduced by the participants themselves, instead of having to theorize and ‘read between the lines’ (Sandelowski, 2010). Consequently, it fosters higher consensus among researchers analyzing the same data - a valuable asset when limited information is available on the topic being investigated (Doyle et al., 2020; Sandelowski, 2000; Sullivan-Bolyai et al., 2005; Willis et al., 2016). The final descriptions are meant to be easily understood by the public, researchers, and clinicians (Sandelowski, 2000; Sullivan-Bolyai et al., 2005). For example, a team of nurses (Roberts et al., 2021) conducted a QD study on weight stigma experiences in adolescents with obesity due to a lack of information in the literature. Insights derived from the participants themselves informed ways in which nursing practices could be improved.

This approach contrasts with other qualitative methodologies such as ethnography, grounded theory, or phenomenology, which focus on social meaning, the development of new theories, or interpretive understandings of experience, respectively (Colorafi & Evans, 2016; Lambert & Lambert, 2013; Nayar & Stanley, 2014). For example, one type of phenomenology requires the researcher to uncover the deeper meaning of lived experiences, particularly in relation to aspects such as self-identity, social interactions, embodiment, the passage of time, and the influence of physical space (Neubauer et al., 2019). Grounded theory focuses on generating theories or conceptual frameworks that emerge from participant’s perspectives. Its purpose is to generate theories derived from real-world observations (Chun Tie et al., 2019). Alternatively, narrative inquiry requires the researcher to construct a ‘story’ by considering the past, present, and possible future of the participant (Wang & Geale, 2015). Such qualitative approaches also rely on existing theoretical frameworks to interpret participants' responses (Neergaard et al., 2009). For example, if a researcher chooses the "Health Belief Model" as a guiding framework

for their study, then they would structure their research and interview questions around the model's key factors – which posits that health-related behaviors are influenced by factors such as an individual's perceived susceptibility to a health problem, severity of that problem, and benefits and barriers of taking action (Janz et al., 1984). As such, in the context of compulsive overeating, interview questions might examine how severe participants think their overeating is and their susceptibility to negative health outcomes due to their eating. Data which aligns with the model would then be extracted and the researcher would identify ways in which the model is confirmed within the context of compulsive overeating. In another case, a researcher may use feminist theory to construct a narrative of FA in female college students.

By contrast, QD is grounded in existing knowledge, connections to previous work, and, if applicable, the clinical experience of the researcher (see Bradshaw et al., 2017). The surface descriptions produced in QD should not be considered devoid of value. Accurately capturing the experiences of individuals navigating through complex health-related issues, and applying these insights pragmatically, can significantly benefit both the relevant field of study and ongoing research endeavors. For example, Dinsdale et al. (2016) used QD to understand the efficacy of weight-management treatment options for pregnant women with obesity. Results were then used to offer recommendations for clinicians into how weight management interventions during and after pregnancy can be improved (Dinsdale et al., 2016).

QD has also been differentiated from similar approaches, such as interpretive description (Thorne, Kirkham, & MacDonald-Emes, 1997) and the descriptive mode (Artinian, 1988). Interpretive description focuses on using subjective interpretations (i.e., participants with first-hand experience) to describe clinical phenomena, for the purpose of developing clinical nursing knowledge. Interpretive description is described as a new methodology, unique to nursing

practices, and is meant to be highly interpretive (Thorne et al., 1997). Alternatively, QD is an existing, yet unacknowledged, form of qualitative inquiry, which offers a low-inference account of an event or phenomenon (Bradshaw et al., 2017). Similarly, the descriptive mode aims to provide a rich description of a life situation of a person or group, as a starting point for generating complex conceptualizations of social processes (Artinian, 1988). Alternatively, with QD, the *description* is the end product, it does not require a highly abstract rendering of the data (Sandelowski, 2000). If we envision qualitative methodologies on a continuum indicating the degree of data transformation, QD would be on the lower end of that continuum (Nayar & Stanley, 2014; Sandelowski & Barroso, 2003).

Lastly, QD is still more interpretive than quantitative descriptive research (Nayar & Stanley, 2014). Quantitative descriptive studies are interpretive in that the researcher influences the study by pre-selecting the variables that will be studied, and in doing so, influences the conclusions that can be drawn from the results of the statistical analyses (Siedlecki, 2020). Yet, the interpretation cannot move further beyond these pre-set boundaries, which include the way concepts are defined in the measuring tools (e.g., surveys; Sandelowski, 2000). Overall, researchers are more restricted in addressing the unexpected when conducting quantitative studies (Sandelowski, 2000). With QD, researchers are obliged to collect and capture as much data as they can, including unanticipated observations (Sullivan-Bolyai & Bova, 2021).

3.2.1.2 Philosophical and Methodological Underpinnings of Qualitative Description

Ontology is a branch of philosophy that studies the nature of reality and our understanding of it (Denzin & Lincoln, 2011). In qualitative research, the ontological perspective leans towards relativism, acknowledging that reality is subjective and varies from person to person – reality depends on how people perceive it (Bradshaw et al., 2017). Epistemology,

another branch of philosophy, explores how knowledge can be created, developed, and communicated – what it means to know, and the relationship between the knower and knowable (Denzin & Lincoln, 2011). Qualitative research most commonly aligns with the epistemological stance of subjectivism, which acknowledges that reality is a subjective interpretation, shaped not only by the research participants but also by researchers themselves (Bradshaw et al., 2017).

QD is situated within the philosophical perspective of *pragmatism* (Neergaard et al., 2009), which acknowledges the presence of one or multiple realities, open to empirical investigation (Kaushik & Walsh, 2019). Pragmatism emphasizes practicality and tailoring research decisions to the specific goals of each study (Doyle et al., 2020). Choices are made based on what will be most effective in addressing the research questions, which may involve alignment with more than one research methodology, enabling flexibility and adaptation throughout the research design and interpretation process (Doyle et al., 2020). In this regard, QD can be viewed as a “noncategorical alternative” (Sandelowski, 2000), that recognizes and incorporates elements from other qualitative methodologies like phenomenology, ethnography, or grounded theory (Doyle et al., 2020; Lambert & Lambert, 2013; Sandelowski, 2000). For instance, a QD study may employ constant comparative data analysis (information is coded and compared across categories to produce new codes) associated with grounded theory, but its primary objective is not to generate a theory (Lambert & Lambert, 2013). As an example, Roberts et al. (2021) used QD to understand the experiences of weight stigma experienced by adolescents with severe obesity and their families, to help inform healthcare practice. Four team members discussed codes over several months until consensus was reached to create the final themes and subthemes (Roberts et al., 2021). In other words, while they used constant

comparison to inform their final codes, their goal was not to develop a new theory regarding weight stigma.

Methodological assumptions in research refer to how researchers approach the pursuit of knowledge and understanding (Lincoln, 2018). As discussed above, QD derives findings directly (inductively) from the data (rather than theory), avoiding substantial transformation or theoretical interpretation (Tamayo et al., 2020). QD studies have been criticized for offering a “quick fix” for novice researchers lacking expertise or familiarity with qualitative designs (Doyle et al., 2020; Sandelowski, 2010). In their review of QD studies, Kim et al. (2017) reported that fewer than half of papers explained why they chose a QD design. To counteract the notion that QD is methodologically expedient, it is recommended that researchers clearly justify why they chose QD to guide their work, particularly if exploring participants’ experiences in which alternate methodologies could have been employed (Kim et al., 2017). Failing to provide such justifications can undermine a study's credibility (Doyle et al., 2020).

In response to Kim et al (2017), the choice of using QD for this study was carefully considered based on its suitability and alignment with the research objectives. First, the pragmatic and straightforward approach of QD makes it fitting to study a vastly understudied phenomenon like patterns of overeating related to obesity. The current understanding of grazing primarily relies on a 12-item questionnaire that originates from bariatric-surgery research. To our knowledge, there are no qualitative studies on grazing, particularly within the context of FA. Additionally, only 12 qualitative studies on addictive-like eating have been published (as of August 2023). Given this scarcity of research, we believed it was premature to present a highly interpretive or theoretical account of grazing and its connection to FA. Instead, QD allowed us to provide a comprehensive and detailed description from individuals with lived experiences. In the

following sections, we elaborate on the methods associated with QD designs and discuss how we applied these methods to our study.

3.2.2 Sample

Purposeful sampling involves selecting participants that have knowledge of, or can speak to, the phenomenon under study (Patton, 1990, 2001), and is recommended for QD studies (Sullivan-Bolyai & Bova, 2021; Tamayo et al., 2020). Maximum variation sampling, a type of purposeful sampling, is particularly recommended (Sullivan-Bolyai & Bova, 2021; Tamayo et al., 2020) whereby, researchers choose a heterogeneous sample of participants representing a combination of pre-selected variables of interest (Patton, 1990, 2001). This allows researchers to explore similarities and differences across non-homogenous groups (e.g., they may be different in age, geographical location, etc.) (Colorafi & Evans, 2016; Patton, 2001; Sandelowski, 2010).

There is conflicting information regarding sample size requirements for QD studies. Sullivan-Bolyai et al. (2005) initially noted sample sizes are moderate (20-50), compared to smaller sample sizes (8-12 participants) in other qualitative studies. However, their more recent work indicated that sample sizes of QD studies have varied widely, from 10 to over 100 participants (Sullivan-Bolyai & Bova, 2021). Opposingly, Magilvy & Thomas (2009) described QD study samples as being smaller, typically ranging from three to 20 participants. Nevertheless, qualitative research, including QD, prioritizes information-rich data over large sample sizes. Generally, qualitative studies involve a smaller number of participants but focus on detailed data analysis to provide more in-depth descriptions (Vasileiou et al., 2018). Data saturation – the point where no new information is obtained – is often considered the gold standard for meeting sample size requirements (as opposed to pre-selecting a specific sample size) (Doyle et al., 2020; Sullivan-Bolyai & Bova, 2021). However, the concept of data saturation as a measure of sample

size has faced criticism, with some arguing that it is inconsistently defined and unreliably used (see Malterud, Siersma, & Guassora, 2016). QD recognizes the practical considerations influencing data collection, such as population accessibility, time, and finances (Nayar & Stanley, 2014, pg. 24; Neergard et al., 2009; Sandelowski, 2000). Therefore, in QD studies it is advised to use data collection processes that align best with the research goal and are feasible within the study's constraints (Doyle et al., 2020; Sullivan-Bolyai & Bova, 2021).

Given the inconclusive views on sample size in QD, we decided to follow traditional qualitative study guidelines, which suggest recruiting 8-12 participants for a relatively homogenous sample (Patton, 2001). It was decided that only females would be recruited for the study due to earlier research showing that disordered overeating behaviours are more pronounced in women (Klump et al., 2017; Reas et al., 2018; Spirou et al., 2023). It was therefore deemed appropriate to first get a baseline understanding of grazing and its relationship to FA, before investigating sex/gender differences. Following maximum variation sampling suggestions for QD designs, we initially aimed to recruit 10 female participants per four distinct participant groups: those with FA, those with BED, those with BED and FA, and a control group of those with obesity but not BED or FA. Our aim was to achieve a comprehensive understanding of grazing and its relationship to FA, so we believed it would be relevant to distinguish FA from its commonly linked eating disorder, BED. We also believed that creating a distinct group of individuals solely with BED would enable us to draw comparisons to those exhibiting compulsive grazing tendencies. We wanted to use a control group to improve the interpretation of our findings.

3.2.3 Pilot Work

Before recruitment commenced, four pilot interviews were conducted via Zoom. The first pilot interview was conducted with a scientist experienced in qualitative research, particularly in interviews with individuals with obesity and BED. The remaining three pilot interviews were conducted with volunteers from an online FA support group, which was run by a patient advocate who reviewed the interview guide (described in further detail in section ‘3.2.5 Interview Guide Development and Administration’). The patient advocate contacted potential volunteers via email, explaining the study’s purpose and requirements. Those willing to participate were contacted by the principal investigator (PI) via email. Volunteers and the patient advocate were given a \$30 e-transfer stipend. Pilot interviews were recorded with the encrypted audio recording device as approved by York University’s Research Ethics Board. The recordings were reviewed by the PI’s supervisor, who gave feedback on the PI’s interviewing techniques.

3.2.4 Recruitment

Female participants from the weight-management clinic that completed the quantitative portion of the study and were between 20 and 50 years of age at the time of recruitment were approached for recruitment (n=115). All participants lived in Ontario, Canada. Participants were contacted by the PI using 3CX, a software-based phone system to gauge interest (see Appendix B for phone script). The name of the clinic showed up as the name display on participant’s phones when called. If there was no response initially, the PI made a second call and left a voicemail. One follow-up email was sent if there was no reply (Appendix C). If a participant indicated interest in the study, they then received an email (Appendix D) with a link directing them to a secure internal website platform, REDCap, for the online consent form and brief demographic questionnaire (Appendix E). Once completed, the PI then contacted the participant

again via email to schedule an interview date. The study was approved by the human ethics committee at York University (certificate #2017-041).

Initially, five participants were contacted per group allocation based on their YFAS diagnosis and BEQ score from their quantitative study questionnaire. A score of four or higher (out of five) on the BEQ indicated likely inclusion in the BED group. In other words, the PI contacted five individuals who scored yes on the YFAS diagnosis, then five individuals who scored at least four out of five on their BEQ, etc. However, the response rate was low – most participants declined the interview or did not answer the call. Thus, after about 50 participants were called, the remaining participants were contacted in sequence of their ID number. In the end, all 115 potential participants were called.

Recruitment and data collection (described further below) occurred simultaneously over a 3-month period, which is common in qualitative studies (Sandelowski, 2000; Nayar & Stanley, 2004; pg. 28). For example, if the PI had time to call 20 participants in a day, and within those 20, one interview was scheduled for the following day, then that interview would occur before remaining participants were called. After conducting five interviews, the PI observed discrepancies between participants' YFAS results and their responses to questions about FA. For example, some participants who did not receive an FA diagnosis through the YFAS expressed that they believed they had an addiction towards foods during the interview. This may have occurred because some interviews were conducted as long as two years after initial data collection for the survey study. Additionally, it was discovered through the interviews that many participants had undergone bariatric surgery or were on Saxenda® or Ozempic®⁶. As such,

⁶Saxenda® (active ingredient/generic name 'liraglutide') and Ozempic® (active ingredient / generic name 'semaglutide') are both medications that help manage blood sugar levels by improving insulin function. They also reduce appetite by delaying gastric emptying, which in turn fosters weight loss (Drugs.com, 2023).

although they did not have cravings or were able to consume large amounts of food at the time of the interview (due to physical limitations of the surgery or medication), they were not true controls in a sense that some had disordered eating behaviours prior to their surgery/medication, and some had persisting compulsive tendencies post-surgery or while on medication. Therefore, categorizing a ‘control’ simply as individuals without FA or BED no longer seemed appropriate.

As a result, participants groups were re-defined into five distinct groups: 1) those with FA – determined by their responses to the interview guide; 2) those with BED – identified using the Structured Clinical Interview for DSM-5 (SCID-5); 3) those with BED and FA; 4) current/past compulsive overeaters – individuals who display compulsive tendencies towards food but do not identify as having an FA or receive a SCID-5 BED diagnosis, as well as those who have a history of compulsive eating, FA, or BED; and 5) control – those who do not currently or have never had any compulsive or disordered eating behaviours. The control group may or not have had bariatric surgery or were taking or have taken Ozempic/Saxenda. The PI administered the eating disorder module of the SCID-5 (American Psychiatric Association, 2013) to determine the presence of BED. The SCID-5 eating disorder module is a semi-structured interview guide used to make DSM-related diagnoses based on the eating and behavioral characteristics of the eating disorder under investigation (e.g., the number of objective and subjective binges). The PI was trained to administer the SCID-5 eating disorder module through pre-recorded virtual training programs offered by the American Psychiatric Association (<https://www.appi.org/products/structured-clinical-interview-for-dsm-5-scid-5>). Practice sessions were conducted with the PI's supervisor and student peers.

We felt it was appropriate to re-define the groups since in QD designs, researchers are encouraged to adapt their research design iteratively based on new insights from their data

(Sandelowski, 2000; Nayar & Stanley, 2004; pg. 28). Accordingly, Table 7 presents the participant count for each of the five different groups. While we initially intended to gain equal representation across all five groups, we were unable to do so since the list of potential participants was exhausted. This table is included for descriptive purposes and was also used to assign transcripts to the second coder (further described in section 2.4 ‘Analysis’). Recruitment and data collection lasted three months.

Table 7: *Count of qualitative participants, presented by group.*

Participant Group					
	<i>FA</i>	<i>BED and FA</i>	<i>BED</i>	<i>Compulsive overeaters</i>	<i>Control</i>
Count	10	2	1	14	7*

FA: food addiction; BED: binge eating disorder

*Of the 7 controls, 2 have had bariatric surgery, 3 are currently on or have been on Ozempic, 1 has had bariatric surgery and is currently on Ozempic, and 1 has not had bariatric surgery or has ever been on Ozempic/Saxenda.

3.2.5 Interview Guide Development and Administration

Data collection in QD studies typically involves minimally to moderately structured open-ended interviews and/or focus groups (Neergaard et al., 2009; Sullivan-Bolyai et al., 2005; Tamayo et al., 2020). The interview guide is designed to strike a balance between structure and openness, allowing for unexpected data to emerge and for modifications to be made if necessary (Neergaard et al., 2009; Sullivan-Bolyai et al., 2005). Researchers typically draw on their expertise to develop the interview guide, since descriptive studies are most often conducted when an event or phenomenon is poorly understood (Neergaard et al., 2009; Sullivan-Bolyai et al., 2005).

In this study, a semi-structured interview guide was developed based on findings from previous literature and the researchers' expertise. This ensured consistency in data collection, while allowing exploration of unanticipated ideas (Doody & Noonan, 2013). It also allowed the PI to adapt the interview guide when necessary – for example, if it was clear that someone did not engage in binge eating behaviours, certain follow-up questions about binge eating were omitted. When creating the interview guide, the PI also consulted with a patient advocate who is a self-identified recovered food addict and FA counselor, to ensure appropriateness and representation of those with FA. Stakeholder feedback is essential in QD studies to ensure that findings are easily understood by affected individuals (Gagliardi et al., 2016; Sandelowski, 2000; Sullivan-Bolyai et al., 2005). To achieve this, the patient advocate was first approached via email. After agreeing to help with the study, she was sent the interview guide via email and then met with over Zoom for discussion. The patient advocate provided feedback and suggested revisions, which were all incorporated in the interview guide.

In QD, interviews can use various methods including online, in-person, or over the phone and typically last 30 to 90 minutes (Sullivan-Bolyai & Bova, 2021). For this study, interviews were conducted on the Zoom platform, in a quiet, private room. At the end of each interview, participants received a \$30 e-stipend to compensate their time. Interviews were audio recorded on an encrypted audio recording device as approved by York University's Research Ethics Board. Audio recordings were uploaded to a password-protected computer and immediately deleted from the recording device once the upload was verified. Recordings were transcribed by the PI, and a volunteer research assistant. Recordings were destroyed upon transcription.

The interview questions comprised open-ended questions related to participants' experiences with compulsive grazing, binge eating, and FA (see sample questions in Appendix

F). Following QD design principles, the PI asked additional questions beyond the interview guide as needed, to allow for new understandings to emerge and to gain greater breadth of experiences. Following each interview, the PI took brief notes which included preliminary interpretations with regards to the interview material.

3.2.6 Analysis

In QD, qualitative content analysis is commonly used to identify the patterns and trends within the data (Sullivan-Bolyai & Bova, 2021; Willis et al., 2016). Content analysis involves the least amount of interpretation compared to other qualitative approaches, such as thematic analysis. This makes it valuable for exploratory studies on topics with limited existing research (Vaismoradi, Turunen, & Bondas, 2013). In some instances, researchers may also choose to count the frequency of words, concepts, or phrases as a guide to data patterns (Hsieh & Shannon, 2005).

Erlingsson and Brysiewicz's (2017) guide on content analysis was used to analyze the data in five steps:

1. Verbatim transcriptions of interviews were completed by the PI (n=27) and a student volunteer (n=7). Subsequently, the PI read all the transcripts to understand participants' responses and to explore potential emerging ideas from the data. Notable areas of text were highlighted, creating "meaning units" – words, phrases, sentences, or paragraphs relevant in answering the research questions (Erlingsson & Brysiewicz, 2017). Text not directly answering the research questions but still noteworthy was also highlighted for consideration.
2. Meaning units were then labelled with a code. A "code" is a word or phrase that describes a group of data in the most basic way (Erlingsson & Brysiewicz, 2017).

This created the preliminary, flexible coding system. Examples of preliminary codes in this study include “grazing”, “food addiction”, and “self-esteem”. All sections of text assigned the same code were then grouped together.

3. A PhD candidate in the obesity field with qualitative analysis experience acted as the second coder. The second coder was randomly assigned seven transcripts representing the 5 different participant groups (Table 7). The transcripts of the participant subgroup labeled as "compulsive overeaters" were examined to distinguish further between individuals who had undergone bariatric surgery, were taking Ozempic®, or engaged in compulsive grazing behavior. Participant IDs were grouped correspondingly in Excel, and the random function in Excel was used to select participants. The second coder and PI met so that the PI can explain the study purpose and methods. The second coder received the transcripts and interview guide, then followed the steps above to independently code the data and establish their own coding system.
4. The PI and second coder met to discuss their identified codes. The PI had 17 codes and the second coder had 20 codes. Four codes were identical: self-esteem, coping with food /emotional eating, loss of control, and addiction. Most of the remaining codes showed high congruency, representing similar concepts but with different labels. For example, the PI originally had a code called “fear of poor health”, while the second coder had a code called “weight concerns” and “family medical history”. In another example, the second coder had a code called “disordered eating”, while the PI had codes called “grazing” and “compulsive eating”. Codes were discussed until the most suitable representation of the data was achieved. The final list

comprised 12 codes with 9 subcodes. The resulting coding scheme is presented in Table 8, including the codes, their definitions, the number of interviews in which they appeared, and the total number of supporting quotes.

5. The PI reviewed and refined the codes into categories. Verbatim quotations were used to support the final list of categories (presented in the results). As outlined by Erlingsson and Brysiewicz (2017), categories were chosen as the highest level of abstraction (as opposed to themes) for reporting results since categories are an expression of manifest content (i.e., what is visible and obvious in the data), while themes are used to express latent content (underlying meanings). Due to the nature of QD design it was considered appropriate that categories would be presented for this study.

Table 8: *Final coding scheme, with description, number of interviews for each code, and number of citations.*

Code	Description	Number of Interviews	Number of Citations
Grazing	• Subcodes ○ Time: refers to time between grazing episodes, and times of day when grazing episodes are more likely to occur (journaling, meal time) ○ Type/amount of food: refers to type and amount of foods eaten during grazing episode ○ Reasons: refers to why they engage in the grazing episode ○ Differences: refers to differences between grazing and other patterns of disordered overeating, or when snacking is differentiated from meals ○ Escalation: refers to grazing getting worse ○ Individual factors: references to individual factors that may affect severity of grazing / ability to stop ○ Cravings	28	61
Food addiction	• Refers to any reference of food as addictive • Includes comparisons to other addictions, and reasons as to why participant identifies with the concept	28	22
Internal conflict	• Refers to conflicting arguments in one's head regarding consuming the food • Refers to making excuses to oneself about why the food should be eaten, trying to rationalize eating the food	16	22

	Refers to feelings of guilt, regret, remorse after eating something, usually in reference to highly processed foods		
Emotional eating / food for coping	- Refers to using food as a coping mechanism to deal with negative emotions, depressive moods, stress - using food to feel better - Refers to instances of mourning / loss which then influence eating	15	21
Effects of surgical procedures / weight-loss medication	- Refers to instances of surgical procedures / weight-loss medication and their impact on weight and eating - Refers to instances when participants talk about their bariatric surgery and Ozempic use, diet and craving change because of one or the other	12	23
Compulsive eating / loss of control	- Refers to an urge to consume something, regardless of hunger - Refers to not being able to say no to food or to get mind off food, loss of power - Refers to having an awareness that their behaviours is not healthy but doing it anyway	11	17
Concerns	- Refers to instances of wanting to lose weight / improve diet due to fears of poor health, or worry about gaining a lot of weight - Refers to having some concerns related to family history	6	9
Thin ideals	Refers to social / cultural ideals of being thin	5	5
Low self - image/esteem	- Subcodes: - Negative body image: Refers to perception of oneself as heavier, unattractive, not liking how they look, mostly regarding appearance - Low self-esteem: Refers to any negative feelings about one's self-worth, value, etc. - Self-isolation: Refers to distancing themselves from others due to low self-esteem, embarrassment	5	7
Non-compulsive eaters	Refers to individuals who do not display compulsive overeating tendencies, and their description of their eating behaviours	3	10

3.2.7 Trustworthiness

Qualitative studies seek *trustworthiness* through credibility (accurate interpretation of participant's views), *transferability* (applicability to other contexts), *dependability* (reliability), and *confirmability* (ensuring findings are derived from the data rather than the researcher's interpretation) (Lincoln, 2018). Compared to other qualitative methods, it is easier to establish credibility in QD because it relies on findings derived from interview data, rather than conforming to pre-existing theories, as described above (Colorafi & Evans, 2016). It should be noted that transferability is limited in qualitative research, and some argue that readers, rather than the researchers, bear the responsibility of establishing whether findings are transferable

(Colorafi & Evans, 2016). Nevertheless, transferability can be enhanced by providing detailed, comprehensive descriptions of the participants and setting (Colorafi & Evans, 2016). Such descriptions help readers determine if a study's context (e.g. participants, setting, etc.) resembles their own, which then assists in evaluating whether the findings are relevant to their research (Clark & Veale, 2018). To enhance overall study trustworthiness, researchers can employ several strategies such as maintaining an audit trail (tracking all decisions made throughout the study process), conducting member checking (presenting analysis to participants or those with lived experience to ensure resonance), peer debriefing (having discussions with other researchers/colleagues), and triangulation (using various data sources or having multiple investigators look at the data) (Neergaard et al., 2009).

Several widely cited scholarly sources (Bradshaw et al., 2017; Elo & Kyngäs, 2008; Guba & Lincoln, 2005; Lincoln, 2018; Lincoln & Guba, 1985) on qualitative trustworthiness were consulted to establish it throughout this study. Table 9 presents Lincoln and Guba's (1985; 2011) criteria for establishing trustworthiness in qualitative studies, and possible methods which can be used to establish these criteria. It then lists markers of how this was achieved in this study.

Table 9: Quality Assurance Steps Followed for Data Collection and Analysis

Measure	Method	Marker
Credibility	Prolonged Engagement	- Participants were recruited from the quantitative study. - The PI went to the clinic from which participants were recruited several times over the course of 5 years. The interviewer primarily went to receive patient information (e.g. weight, height, telephone number) from a secure computer to recruit participants. - The PI conducted four pilot interviews, three were with individuals with lived experience. - The PI conducted all 34 interviews herself. - The PI looked over the data (both within and across interviews) multiple times.
	Persistent Observation	- The PI has been studying compulsive overeating for over 7 years. - The PI's supervisor is an expert in this topic, and has had extensive experience in conducting both quantitative and qualitative studies on this topic.
	Triangulation	Methodological triangulation was used by gathering quantitative data (earlier studies), and through in-depth interviews and field notes. The PI had each participant's response to the quantitative

		survey. - Investigator triangulation was applied by involving several research team members throughout the decision-making process: - A qualitative analysis expert was consulted, and methodological decisions were made amongst 4 researchers in obesity. These researchers were involved in addressing the organizational aspects of the study and the analysis process. - Data were analyzed by two different coders. This process is described in detail in section 2.6. - Categories were reviewed by the PI's supervisor and by a patient advocate.
	Peer debriefing	- The PI received feedback on the pilot interviews from their supervisor and a scientist colleague. This is described in detail in section 2.5. - Regular committee meetings with the PI's supervisory committee were also held. - A second coder was used.
Confirmability	Audit trail	- The PI kept electronic notes of all research activities, which had detailed memos of the data collection and analysis processes. All meeting notes were also saved. - Reflective thoughts, and thoughts about potential codes/themes were documented by the PI throughout the study process.
	Triangulation	Described above.
	Reflexivity	Reflexivity was kept throughout the data process and is described in more detail in section 3.2.7.1.
Dependability	Inquiry audit	Research team members met to debrief and summarize their findings. Any biases were voiced, recorded, and considered to ensure that the analyses were not influenced by researcher bias.
Transferability	Thick description	All research processes have been documented in detail throughout this dissertation, thus enabling readers to decide whether the study results can be transferred to their settings.

3.2.7.1 Reflexivity

Although qualitative researchers strive to maintain neutrality and minimize bias, complete objectivity is unattainable due to individual preferences and experiences shaping their interpretations (Arsel, 2017). Researchers serve as the main instrument for data collection and analysis, so their experiences impact how the study is completed (Clark & Veale, 2018; Sandelowski, 2010). They select and emphasize what they consider meaningful, potentially shaping data representation (Sandelowski, 2010). Therefore, all research, including quantitative, involves some level of interpretation influenced by researchers' (and participants') knowledge,

beliefs, and experiences. In other words, researchers' personal biases can still influence the descriptions provided in QD (Sandelowsk

3.2.7.1.1 My Reflection

I am a health science Ph.D. candidate with considerable knowledge in the field of compulsive overeating, particularly food addiction, compulsive grazing, and binge eating. I have no experience with living with obesity or disordered overeating, although I do have close family members and friends who have struggled with overweight and obesity throughout their life. As such, my understanding of these conditions comes from anecdotal reports, the clinical and scientific literature, and my earlier work – not through personal experiences. For example, I formulated the research questions and interview guide by identifying gaps in the literature and aiming to make a relevant contribution to the field. It is therefore important for me to acknowledge and critically reflect upon my own background, perspectives, biases, and potential impact of my identity on the interviews and analysis.

I have followed a pragmatic approach to research and believe that methodological choices should be based on their effectiveness in addressing the research questions. This is why I value both qualitative and quantitative methodologies and consider myself a multi-method researcher. Pragmatism emphasizes the practical relevance of research to the lives and experiences of individuals involved (Kaushik & Walsh, 2019). My goal is to contribute to a better understanding of compulsive overeating behaviours, particularly in those with obesity, to inform interventions, treatments, or policies related to this issue. I recognize that bias is inherent in all research. Although transparency through reflexivity is essential, complete neutralization of bias is impossible. I agree with those who claim that researchers are integral to the qualitative research and final outcomes, and that attempting complete detachment from this process is

neither feasible nor advantageous (Galdas, 2017; Olmos-Vega et al., 2022). Instead, the focus should lie on ensuring the researcher's transparency and reflexivity throughout the study to ensure a thoughtful approach.

I have different personal experiences and societal privileges than some of my participants, and my perspective as an outsider to the participants' experiences provides me with a limited understanding of their lived realities. My own belief is that FA is a genuine condition characterized by various patterns of intake, akin to other substance-use disorders. However, I approached the study with an open mind, staying receptive to the perspectives of participants, and being willing to adapt my own views if necessary. I strongly believe that individuals with lived experience have a deeper understanding of their condition than I do, and I highly valued their insights in shaping the research findings and interpretations.

My presence as a researcher may have influenced the participants' responses due to unintended power dynamics. To address this concern, I prioritized building a strong rapport with the participants. One way I did this was by receiving feedback from a patient advocate on the interview guide – I wanted to ensure that the questions were respectful and would resonate with the participants. During the interviews, I actively listened to the participants, allowing them to fully express themselves without interruption. I strived to be open-minded and non-judgmental, fostering an environment where they felt comfortable sharing their thoughts and experiences. Throughout all the interviews, I genuinely tried to understand and empathize with what they were sharing. I truly felt that all the participants were very open and comfortable with me, as they shared a lot of detail about their experiences. Several interviews evoked strong emotional responses both from myself and the participant.

To stay true to QD design and to mitigate biases, I used reflexivity at every step of the data collection and analysis process. As Erlingsson and Brysiewicz (2017) describe, it is a difficult balancing act between navigating one’s assumptions, opinions, and personal beliefs, and not letting them unconsciously steer the analysis process, while simultaneously, consciously, drawing on one’s pre-existing understanding to interpret the data. In addition to self-reflection, I took proactive measures to involve various individuals at different stages of the study to reduce potential biases. I engaged in ongoing dialogues with my supervisor, supervisory committee, colleagues, and experts, to receive feedback on my decisions points. The second coder and I also discussed our potential biases during our meetings and made concerted efforts to stay true to the participants’ voices. While it is impossible to eliminate my biases from this research, I have tried to describe my research process in detail to promote transparency and make my results trustworthy.

3.3 Results and Discussion

Thirty-four participants between the ages of 32 and 50 years were recruited for the study (see Table 10 for further demographic characteristics). Table 11 presents the profiles of each participant including their pseudonym; presence of FA, BED diagnosis, and/or compulsive grazing at the time of interview; whether they have had bariatric surgery or are on weight-related medication; and other relevant notes taken by the PI. Interviews ranged from 35 to 72 minutes in length. Transcripts ranged from 9 to 23 pages in length. Greater interview length was mainly attributed to the presence of compulsive overeating behaviours, and the need to administer the SCID for BED. If a participant did not exhibit compulsive overeating behaviours, some questions were omitted resulting in a shorter interview.

Table 10: *Descriptive statistics for the qualitative sample (n=34).*

Variable	Count (n, %)
Educational background	
Some high school	2 (6%)
Graduated secondary/high school	2 (6%)
Some college/technical school	4 (12%)
Graduated college/technical school	9 (26%)
Some university	4 (12%)
Graduated university	12 (35%)
Other	1 (3%)
Ethnic Background	
Black (e.g., African, Haitian, Jamaican, Somali)	7 (21%)
Latin American	1 (3%)
Southeast Asian	3 (9%)
White (Caucasian)	18 (53%)
Mixed-race	4 (12%)
Other	1 (3%)
Years in North America	
6-10	1 (3%)
11-15	2 (6%)
16-20	6 (18%)
21+	25 (74%)
Taking prescription medication	
Yes	24 (71%)
No	8 (24%)
Would rather not answer	2 (6%)
Presence of long-term health conditions (over 6 months)	
Yes	19 (56%)
No	12 (35%)
Would rather not answer	3 (9%)

Results are presented by the categories derived from the content analysis. This process involved examining the codes assigned to participant's quotes and grouping those that were substantively similar into an appropriately-named category. Differences in perspectives among participant groups (e.g. FA, BED, BED and FA, BED, compulsive overeaters, non-compulsive eaters) are conveyed within each category when applicable. For example, in the "characteristics of compulsive grazing" category, we discussed how individuals with compulsive grazing describe their eating, compared to how non-compulsive eaters describe their snacking. Engaging diverse participant groups helped us explore the varied experiences and complexities associated with FA, BED, and compulsive grazing.

Three categories emerged: 1) Characteristics of compulsive grazing; 2) The validity of food addiction; 3) Potential treatment options for compulsive overeating. Table 12 presents the categories, and total number of interviews and citations. Following the table, each category, and subcategories (where applicable) are described in further detail. Quotes supporting each category and subcategories are used as examples.

Table 11: *Participant profiles.*

Pseudonym	Presence of FA at interview	SCID BED Diagnosis at interview	Presence of compulsive grazing at interview	Bariatric Surgery	Medication	Description
Stacy	Yes	No	Self-identifies as being a compulsive grazer	Yes	No	- Started gaining weight since childhood, history of being a smoker - No history of BED or binge eating - Presence of emotional eating
Dawn	No	No	No	No	No	- Started gaining weight during pre-teenage/teenage years - No history of BED or binge eating - Compulsive / emotional eater
Brenda	No	No	No	No	No	- Skinny/small as child, weight gain due to pregnancy - History of pre-diabetes - No history of BED or binge eating - History of substance-use disorder - No presence of any disordered eating at time of interview
Laura	No	No	No	No	No	- Presence of obesity since childhood - No history of BED or binge eating - Some compulsive eating in the past including compulsive grazing
Jessica	No	No	No	Yes	No	- Started gaining weight in adolescence - Had bariatric surgery

						History of binge eating and compulsive grazing before bariatric surgery
Janet	Yes	No	No	No	No	- Started gaining weight in early teens - No history of BED or binge eating - Presence of compulsive / disordered eating
Loretta	No	Yes	No	No	No	- Overweight since childhood, gaining weight since - Presence of compulsive / disordered eating
Maria	No	No	No	Yes	No	- Overweight since childhood, gaining weight since - History of binge eating before surgery
Claudia	No	No	No	Yes	Ozempic	- Started gaining weight in early adulthood - No history of BED or binge eating, but previous history of disordered / compulsive eating prior to surgery
Rebecca	No	No	No	No	No	- Overweight since teenage years, gaining weight since - History of disordered eating, not currently
Renee	No	No	No	Yes	No	- Started gaining weight during/ after pregnancy - History of substance-use disorder - History of binge eating prior to surgery
Teresa	No	No	No	No	Ozempic	- Started gaining weight through puberty, at first a little overweight, presence of obesity since mid 20s - History of disordered eating including binge eating, compulsive grazing, night-time eating
Yolanda	Yes	No	No	No	Ozempic	- Average weight as child, started gaining weight during puberty and after pregnancies - History of binge eating prior to medication

Whitney	Yes	No	No	Yes	No	• Overweight since childhood, gaining weight since • Presence of disordered eating, past presence of compulsive grazing
Crystal	No	No	No	No	No	• Started gaining weight as a teenager • History of binge eating, emotional eating, and compulsive grazing
Grace	Yes	No	Self-identifies as being a compulsive grazer	No	Used to take Saxenda	• Started gaining weight in childhood, gaining weight since • Presence of binge eating (not clinical BED) and emotional eating
Betty	No	No	No	Yes	No	• Started gaining weight during adolescence, gaining weight since • Presence of thyroid issues • No presence or history of any disordered eating
Sandra	Yes	No	Self-identifies as being a compulsive grazer	No	No	• Started gaining weight in teenage years
Tanya	No	No	No	No	No	• Normal weight as a child, started gaining weight after pregnancy
Natasha	Yes	No	Self-identifies as being a compulsive grazer	No	No	• Started gaining weight at puberty which was around 14 • Has had weight fluctuations from normal weight to overweight throughout life • Gained more weight after second child
Melanie	Yes	No	Self-identifies as being a compulsive grazer	No	No	• Has had overweight/obesity since childhood • History of alcohol-use disorder • Presence of binge eating (not clinical)
Chelsey	No	No	Self-identifies as being a compulsive grazer	No	No	• Started gaining weight in mid 20s
Connie	Yes	No	Self-identifies as being a	No	No	• History of alcohol-use disorder (everyday drinking)

			compulsive grazer			
Charlene	Yes	No	Self-identifies as being a compulsive grazer	No	No	• Always felt larger, since childhood
Deanna	No	No	No	No	Used to take Ozempic	• Heavier from childhood • No presence of disordered eating
Tina	No	No	No	No	Ozempic	• Normal to underweight entire life, gained weight during pregnancy • No history or presence of disordered eating
Mary	Yes	Yes	Self-identifies as being a compulsive grazer	No	No	• Started gaining weight in 20s • Potential presence of substance-use disorder
Summer	No	No	No	Yes	Used to take Saxenda, prior to bariatric surgery	• Was heavier since childhood • Some history of compulsive eating
Wendy	Yes	Yes	Self-identifies as being a compulsive grazer	No	No	• Started gaining weight as a child • Presence of emotional eating
Ruth	No	No	No	Yes	No	• Started gaining weight at 18, gaining weight since • No history of binge eating • Identifies as having had food addiction, some cravings still, some instances of compulsive grazing
Joan	No	No	No	No	Used to take Ozempic	• Heavier since childhood, • History of binge eating (sub-clinical) and compulsive grazing • Identifies as having had FA in the past
Wanda	No	No	No	No	No	• Started gaining weight in 20s • History of binge eating, compulsive grazing, emotional eating, FA • No disordered eating at present
Kathleen	No	No	No	No	Ozempic	• Started gaining weight after first pregnancy. • No history or presence of disordered eating

Theresa	No	No	No	Bariatric surgery	No	• Started gaining weight as a child • Potential previous presence of compulsive grazing, no current disordered eating
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Table 12: *Final list of categories with number of interviews and citations.*

Category	Number of Interviews	Number of Citations
Characteristics of compulsive grazing	28	62
The validity of the concept of food addiction	29	23
Potential treatment options for compulsive overeaters	12	24

3.3.1 Category 1: Characteristics of compulsive grazing

Participants who engaged in compulsive grazing (either presently or in the past) offered detailed accounts of their experiences, which included the varieties and amounts of foods consumed during these episodes, the time spans and specific periods of the day associated with grazing, and the cravings and lack of control they experienced with this eating pattern. They also made clear distinctions between compulsive grazing and binge eating and discussed how compulsive grazing fits within the FA construct. Four sub-categories emerged: 1) temporal dimensions; 2) craving-mediated choices; 3) dysregulated food intake; and 4) distinguishing grazing from binge eating.

3.3.1.1 Temporal Dimensions

In general, compulsive grazing episodes were sporadic and unplanned, and involved eating at a regular pace, often with breaks between bites, or waiting minutes to hours between eating periods. Compulsive grazing involved “*eating a little bit of everything*” [Natasha] all throughout the day:

“It’s more like picking all day long, that’s what I feel like I’m doing [...] it feels like I’m always eating something.” [Whitney]

“If I’m home I’ll go to the fridge over 10 times a day [...] every half an hour.” [Natasha]

Time intervals between grazing episodes varied from “every 30 minutes to an hour” [Laura] to at most “two hours” [Natasha]. Some participants were more prone to compulsive grazing in the evening – often because they were too busy to eat during the day due to work obligations:

“Sometimes, it would be like I’m going to have some popcorn at night even though I probably shouldn’t, sometimes I had some Dorito chips and salsa dip cause it’s a Friday night why not. [...] Sometimes I would have like bread at night too, I wouldn’t track, I would just eat.” [Laura]

Participants also contrasted grazing episodes from structured mealtimes. Meals were defined as being planned and occurring within specific timeframes, “[...] breakfast is 8-9 in the morning, lunch is 11:30 to 1:30, dinner between 5:00 and 6:30” [Jessica]. These traditional structure of meals — sitting down, eating, and then moving on — differed from the fragmented and less defined patterns of compulsive grazing, which were more unplanned:

“Well, I would classify it as grazing because it’s not one sitting. Like when I think about somebody saying that they’re eating, I mean I would think that it’s an established time, they sit down, they have a meal, they finish the meal, they continue their day. That’s not how it is with me, that’s not how it is.” [Stacy]

3.3.1.2 Craving-Mediated Choices

Participants with compulsive grazing recognized that this behaviour was “fueled” by strong cravings for hyper-palatable foods, high in sugar, salt, and/or fat. Such foods primarily consisted of “junk food” – like potato chips, cookies, chocolate, ice cream, candy, popcorn, nachos, and cake.

“The compulsive grazing, you see it, you crave it, you want it. [...] it calls out to you, it says come out and eat me.” [Wanda]

“I’m always craving something sweet, like I always need to eat something. And then when I do find that something sweet I’ll eat more than I should.” [Natasha]

“I’ll bake a cake, one slice turns into two slices, in the middle of the night you have a craving for that cake you know it’s right there, you’re gonna get up and you’re gonna go get it.” [Joan]

Texture also influenced choices:

“I would say I have cravings towards anything that has crunch which means it’s fried or anything that is high in sodium or has a lot of flavour. [...] I’ll give examples. So, french-fries, I have an intense desire for french-fries always. I would also say like things that are crunchy like chips.” [Stacy]

Participants who engaged in compulsive grazing were unable to control their cravings, they described them as, *“something that you can’t stop”* [Connie]. There was also a prevailing belief that satisfying these cravings was challenging:

“It’s hard to hit that craving. I don’t know if this is a thing you’ve encountered but like if I don’t know what that craving is it’s really hard to hit.” [Melanie]

This contrasted with the habits of non-compulsive grazers, who chose healthier snack alternatives and did not snack as frequently:

“I don’t really snack very often. When I do I cut up like peppers in the fridge. Occasionally I’ll snack on some cheese. [...] a vegetable or protein in between my meals. [...] That’s typically it I don’t really have a ton of snacks, I’ve never been a snacker.” [Brenda]

3.3.1.3 Dysregulated Food Intake

A lack of control during intake was identified as a central component of compulsive grazing. Some words used to describe this included: *“uncontrollable”, “urge”, “no self-control”, “no willpower”, “need”, “drive”, and “compulsive.”* All participants found it challenging to resist food and often ended up consuming more than they intended. They also had difficulty cutting down their overall food intake despite having a desire to do so. Importantly,

participants recognized that their behaviour was not driven by “boredom” or “hunger”, but by “compulsion”:

“When there’s like Halloween candy in the house, I am compulsive. [...] I think Halloween candy is like the death of everybody. I’ll have a Mars bar and I’ll be like oh that’s pretty small, and I’ll go back, and I’ll go back. [...] I don’t think I realize how much I’ve eaten until I’m in a sea of candy wrappers... I’ve just eaten 10.” [Chelsey]

“When I do find that something sweet, I’ll eat more than I usually would. [...] I’ll go overboard a little bit, if there is a pack of four cookies, I’ll eat three of them. Or if there’s muffins or chocolates, I’ll eat the whole chocolate bar when I’m supposed to eat half of it. Or I’ll eat two muffins. Whatever is there I usually eat, it’s the sugars that keep me going.” [Natasha]

Individuals were very aware of the incongruity between their actions and their desire to not consume these foods:

“Just when I decided I had to have something... I’ll sometimes be in the middle of eating that, and I’m like I don’t want this... but I will. I know I shouldn’t have it, I know I don’t want to eat it, but I do, and then I feel guilty later.” [Mary]

All participants with compulsive grazing tendencies wanted to reduce their consumption yet struggled to do so:

“Stopping is the hardest... it’s almost like you’re in a trance, you just have to do it.” [Joan]

“It’s so anticipatory like oh my gosh you know popcorn with lots of butter on it, like I can’t wait I can’t wait this is going to be so good, and then there’s a build up, and then you have the popcorn, and you’re like oh this is as good as I thought it would be, and then you feel full, and then the next day, these pants are a little snug. I definitely feel heavier bloatier, that negative feeling afterwards wasn’t enough of an inhibitory effect to not repeat the action. You put your hand on a hot stove, it burns, you’re like I’m not gonna do it again. But the negative feelings afterward weren’t negative enough to stop me from doing it again. I kept putting my hand on the hot stove knowing full well that the stove is hot, it’s gonna hurt, I’m going to regret it afterwards, but I’m gonna keep doing it.” [Jessica]

These admissions reflect participants’ desire to stop and the overpowering urge to consume. Negative emotions exacerbated this inability to stop, despite having awareness of the undesirable consequences:

“If I’m having a bad day, I’ll stop at the grocery store and get a slice of cake. [...] I know I’m not supposed to eat it, I know I need to be healthier, that is not a proper food choice. But because the desire of it wanting it so bad, I know what it’s going to do for me in terms of escaping, I know what it’s going to do to me, it overrides everything.” [Sandra]

Some participants described going to extreme lengths to control their behaviours:

“I’ve even tried like buying an item like a box of cookies for instance, like I bought some snacks, and I tell myself don’t touch it, don’t touch it. So because I don’t have that control, I started putting dishwashing soap on those items so I don’t eat it or touch it, and that’s the only, its soapy and garbage so I won’t eat it, that’s how bad it is with control.” [Crystal]

“We had leftover cake in the fridge, and I kept thinking about it, and I had a piece, and I kept thinking about it, and I went in the fridge, and I took it and put it in the green bin, put it outside. And I’ve done that a few times with other things that I keep thinking about or wanting to go to and I’m like no I’m just going to cut this behavior off and get rid of it.” [Ruth]

These conceptualizations contrasted with those of non-compulsive participants, whose snacking was mainly driven by hunger-related cues:

“Sometimes I’m not quite hungry but I’m feeling lethargic-y so I’ll grab an apple or something. Typically, I don’t snack unless I feel the need to.” [Brenda]

These participants also demonstrated the ability to control their intake:

“One or two chips ahoy, a slice of cake, a serving of the McCain frozen delicious [...] I feel like that’s enough, I like to ration. I don’t go back for more.” [Deanna]

3.3.1.4 Distinguishing Grazing from Binge Eating

Participants who engaged in binge eating and grazing were able to make a clear distinction between the two, particularly regarding eating speed and quantity. According to them, binge eating involved rapid consumption of substantial amounts of food in a short time span, an all-encompassing focus on consumption with no intermission, and feeling “*stuffed*” and “*sick*”. Alternatively, compulsive grazing involved “*just casually eating*” small amounts of food at a regular pace, often with breaks between bites, or waiting minutes to hours between eating

periods. Therefore, participants' accounts of binge eating and grazing were consistent with the existing definitions of both constructs.

While compulsive grazing involved emotional eating, negative emotions were seen as more powerful triggers for binge eating. For example, participants described feeling “antsy” or “restless” before compulsively grazing. Alternatively, binge eating episodes were linked to emotions like “grief”, “loss”, “depression”, and “stress.” Participants who had presence or history of both eating patterns explained this differentiation:

“There can be, but I don’t think as strong [as binge eating], not as a strong correlation. [...] negative emotions play more into the binge eating. [...] I think stress factors into a small degree [for grazing].” [Jessica]

“I think a binge is a compulsive graze out of control [...] For me when I know it’s a binge, there’s usually something underlying it, an emotional component, I’m upset, my aunt’s dying of cancer, whatever it is. For me, the binge is trying to cope with that part, where the grazing everything is totally fine.” [Melanie]

“Bingeing is more of an emotional, there is an emotional component, I watched myself, especially in the last year I watched myself, there’s an emotional component to it. [...] I’ve had situations where there are other tempting items in the house, but because I don’t have that emotional, feeling emotionally distressed or whatever I don’t feel pulled to partake in a full binge. If it’s just that one item I’m fixated on that one item and that’s what I’m going to have [...]. With the grazing, it’s more like you are trying to satisfy a temporary craving.” [Grace]

“If I am sad I binge eat, it is emotional, I eat and eat and, eat, with grazing I literally want the flavor in my mouth. I wanted it I, got it, now it’s good.” [Wendy]

“I am an emotional eater so I believe that if my emotions are in control, not in control, but if I recognize my emotions I will be able to better eat healthier [...]. I recognized this year that when my emotions are not stable, when I’m stressed, when I’m not happy, when I’m upset, is those are the times that I eat the most.” [Crystal]

“For me I find when I do have a binge, it’s because I’m stressed, upset about something. Because of circumstances in my life, because I was stressing about issues, I’d be like I don’t care, I’d have this conversation with myself. I know yes it’s going to do this and I know it’s going to set myself back, I don’t care, this is what I want and that’s my comfort.” [Grace]

Due to the strong negative emotions involved with binge eating, most participants found it more difficult to control than compulsive grazing: *"When I was binge eating, it was harder to stop. It wasn't a rational decision"* [Teresa]. Similarly,

"An urge takes over you [during binge eating], you're not gonna be satisfied, you can't sit still unless you eat something, so it's like I have to eat this big burger, or I can't move on. I'm fixated on something to eat. If I'm hungry, I would eat everything that I see, and then I get so full I feel sick. Especially when you're hungry, you have no control, it doesn't matter what anybody says, what you told yourself. You won't feel relief unless you eat it. To stop that feeling you have to open your fridge." [Wanda]

Jessica, who had a history of binge eating prior to her bariatric surgery, believed that compulsive grazing could escalate into binge eating if someone's emotional state deteriorated and they persisted with the behavior:

"I think in some ways they are on opposite ends of the spectrum, but they're on the same continuum. You start off as a functional grazer, and then you kind of slowly work into compulsive grazer, and then compulsive grazing with occasional binge eating, and then less often you're compulsive grazing and a little bit more bingeing, and then you're looking at compulsive grazing in the rear-view mirror and you're bingeing all time. So yeah, it's like putting the frog in in the pot of water. If you stick a frog in hot boiled water it's going to jump out like holy crap that's hot, if you put him in cold water, and you slowly turn up the heat, it's not going to realize in 5 minutes it's boiling, so I think it's a very slippery slope." [Jessica]

Jessica also noted that the transition from compulsive grazing to binge eating can vary among individuals based on their emotional states. The following conversation took place with the interviewer:

"How long do you think that can take, to go from healthy, to compulsive grazing, to binge eating?" [Interviewer]

It depends on the person okay. Okay, you can go from point A to point B being bingeing, weeks, months, it could take years. It depends on so many individual factors. The person, their lifestyle situation. [Jessica]

What individual factors? [Interviewer]

It could be something as simple as seasonal. In the winter I know in the winter I tend to gain weight because again I'm not out as much, I'm home more [...] stressors, work,

home life, the world around you, the news. Yeah if you're predisposed to being a stress eater, or emotional eater for negative emotions, that impacts it. Hormones, so many little tiny threads that if you took each one individually it would be inconsequential, if you thread two or three together not a big deal, if you make a carpet out of them all of a sudden you're shoveling Ben & Jerry's like there's no tomorrow." [Jessica]

Accordingly, it was common for participants who had BED, or binge-eating tendencies, before bariatric surgery to compulsively graze post-surgery. This was attributed to the persistent urge to eat and the presence of cravings, despite physical limitations preventing them from consuming the same amounts of food as before their surgery. For example:

"But even after [bariatric] surgery people would think that you don't want to eat that stuff but I still want it, I just can't fit it into my stomach, if I could get away with it I would eat it all." [Whitney]

"Grazing is all day long, binge eating I was stuffed and then that's it I don't eat anymore I could go all day and not eat anymore. [...] now I'm hungry I could eat something, and then half an hour later I'm hungry again, I don't know if it's my brain, it's just a whole different life." [Whitney]

"A binge is a lot more, not quite cleaning out the fridge, but I used to be able to finish a whole pizza by myself, relatively quickly, within 45 minutes. [...] With a graze I am going back and forth to some degree, or I'll have a few handfuls and not touch the bag for a bit, grab a few handfuls, not touch the bag for 5-10 minutes." [Jessica]

3.3.2 Category 1 Discussion

To the best of our knowledge, this is the first study to document the experience of individuals with compulsive grazing. Previous research has stemmed from validated measures created by scientists within the bariatric surgery field, who have described compulsive grazing as sporadic eating over a prolonged period with LOC (Conceição et al., 2017). Existing research lacks a detailed understanding of this eating pattern, particularly from the perspective of individuals who experience it.

Our participants described compulsively grazing approximately every 30 minutes to 2 hours, eating casually with pauses between bites. For some, this eating pattern was more

prevalent in the evening. Typical snacks included potato chips, cookies, chocolate, ice cream, candy, popcorn, and cake. Similarly, da Silva Junior et al. (2023) found that participants who met diagnostic criteria for FA were less likely to have breakfast and more likely to have a late-night snack. Interestingly, a qualitative study of adults with FA found that 24 out of 34 participants identified chocolate as their most craved food (Collins et al., 2021). Our participants also described cravings and emotions as primary drivers of their grazing and felt LOC during eating episodes. Similarly, others described snacking as a coping mechanism to navigate through challenging situations in the workplace (O'Connor et al., 2008). Energy-dense snack food consumption has also been associated with emotional eating in women, particularly those with depressive symptoms (Camilleri et al., 2014; O'Connor et al., 2008). Therefore, our findings support Conceição et al.'s (2014) definition of compulsive grazing, by indicating that it is applicable not only for bariatric surgery patients, but also for individuals with compulsive overeating disorders, like FA and BED.

Most notably, participants were able to clearly distinguish between binge eating and grazing. For certain participants, heightened emotions caused a transition from compulsive grazing to binge eating. These findings underscore the similarities between the two eating behaviors, in that they are both influenced by negative emotions, but also highlight that binge eating represents a more severe form of disordered eating. Similarly, Conceição et al. (2019) found that objective/subjective binge eating involved greater LOC than compulsive grazing.

However, although compulsive grazing has been previously conceptualized as a milder form of compulsive overeating (Conceição et al., 2019; Wilson et al., 2021), this should not diminish the distress it can cause individuals, and the need to consider this eating pattern in clinical interventions. Interestingly, research has found that patients scored similarly in

uncontrolled eating, emotional eating, weight concerns, and negative urgency regardless of whether they engaged in binge eating, or compulsive grazing (Conceição et al., 2018). Compulsive grazing is also associated with increased eating disorder psychopathology and distress (Heriseanu et al., 2017). In comparison to other addiction disorders, it is noteworthy that only 6.5% of individuals with alcohol-use disorder binge drink (Epstein et al., 2004). This implies that other drinking patterns – such as frequent, but intermittent, drinking – can also warrant a clinical diagnosis (Epstein et al., 2004).

Several participants expressed self-consciousness about bingeing in public or around others. Previous research suggests that affected individuals may sometimes exhibit more self-control – in the form of dietary restriction – as a countermeasure to their binge eating (Preuss et al., 2019). Therefore, we speculate that individuals who engage in both eating patterns may resort to compulsive grazing as a compensatory mechanism to manage their cravings and compulsive urges – especially in the presence of other people. It is important to mention, however, that this approach is not considered advantageous or effective for weight loss since it does not tackle the underlying compulsive urges to eat. The cumulative food intake through multiple grazing episodes can result in substantial caloric intake and contribute to weight gain (Conceição et al., 2017; Heriseanu et al., 2019b). Accordingly, previous research has established associations between compulsive grazing and increased BMI (Conceição et al., 2017; Heriseanu et al., 2019b). It is important to take this into consideration when designing nutrition plans for weight-management patients. Treatment programs that encourage snacking or consuming frequent small meals (e.g. Aljuraiban et al., 2015) may unintentionally cause these individuals to erroneously perceive their eating pattern as beneficial.

It has also been shown that 94% of post-bariatric surgery patients continue pre-surgery grazing habits, while others can develop this behavior after the procedure (Colles et al., 2008). This leads to reduced weight loss or even regain, making the surgery futile (Conceição et al., 2018; Conceição & Goldschmidt, 2019; de Lourdes et al., 2022; Saunders, 2004; Zunker et al., 2012). Therefore, it is also advisable to screen for and monitor for compulsive grazing in weight-management patients, especially when permanent solutions like bariatric surgery are considered.

3.3.3 Category 2: The Validity of the Concept of Food Addiction

All participants confirmed their opinion that FA is a genuine disorder, either based on personal experiences or from observations of other individuals with addictive tendencies towards food. There was no ambivalence from anyone that certain foods could become addictive for certain individuals. Participants used terms like “*addiction*”, “*endorphins*”, “*pleasure*”, “*hooked*”, “*a rush*”, “*desire*”, and “*obsession*” to characterize FA. Those with self-identified FA reported experiencing intense pleasure and excitement from food, which was unrelated to physical hunger:

“[...] like as soon as I consume it like I get a rush out of it [...] it's not the best feeling, [...] but it's a rush that you get after like a satisfaction.” [Melanie]

“It is an addiction, like sugar, I'm drawn to certain foods, which happen to be high in carbohydrates and sugar, and I can't seem to get a grip on it, so it feels like an addiction. [...] I feel like the desire is so strong.” [Sandra]

Participants with self-identified FA described using food as a “coping mechanism” to manage various emotional states, particularly depressive moods, stress, and grief. Food served as a means of solace, distraction, and relief from negative emotions:

“It's a reprieve from what's bothering me, and from all the crap that's getting me down. [...] I need that little extra boost, to forget about the shit that's bothering me, to try to get me out of a depressive mood even if it's for a short term. And even though I know I'll probably feel bad about it later, it will get me out of that for a little bit.” [Melanie]

“Comfort” was frequently used to describe the feelings food evoked, and some participants noted food as their only source of comfort: *“Food in some way became a friend”* [Jessica]. However, it was also common for participants to recognize the temporary nature of the comfort they received from food:

“It’s a temporary comfort, mind you. Like most things that are tempting, it’s not a lasting feeling, but it’s something that feels good in the moment that I can enjoy, [...] It’s destructive, but it’s a temporary comfort for me that I can go to. [...] There is a temporary happiness that comes to me, whatever is bothering me, or I’m stressed or frustrated about, is nowhere in my mind, I get to focus on something else, it’s a release and a relief for me and it’s, I don’t know if I want to say, it’s kind of like, you’re doing something that is taboo, I’m participating in something that’s taboo, but you know what, I don’t care, throw caution to the wind, I’ll deal with the consequences after. That’s kind of what it feels like.” [Grace]

“It wasn’t an escape because as soon as after I consumed it I would have, I would even go further down, meaning my emotions would go further down it wasn’t an escape [...] That was my method, it’s not great but it’s better than drugs and alcohol.” [Crystal]

Participants also equated their food consumption to the numbing effect of other addictive substances:

“It’s the same as drinking, you’re trying to numb, trying to get that fix.” [Connie]

“You know what just how you would use any type of drug, it’s just because you want your mind to go numb. You want to reach that phase that you’re not thinking about what is going on.” [Wanda]

It was common for participants to make comparisons to other substance-use disorders, to articulate the overwhelming feelings they have towards food:

“It’s no different than alcohol addiction, drug addiction. Addiction is addiction, your brain doesn’t know the difference, pleasure is pleasure. [...] I almost feel like a heroin addict, like I need that fix.” [Jessica]

“I watch these characters on [name of show omitted] and I’m disgusted by them because they’re just doing absolutely deplorable things to feed their addiction but I’m doing the same thing. I’m not shooting up, I’m not prostituting myself to get the next fix, but I am doing like the same things, where I’m still feeding these addictions. [...] I have all the tools at my fingertips, but I still keep going back to this disgusting dirty drug-addict. And he himself [referring to a character on the show] is completely self-aware that he is like

constantly in this drug-induced, alcohol-induced like stupor, and how he's getting by life by the teeth of his skin he doesn't know, but he's looking for the next fix. Like a lot of times you know I do feel like that, like where I do know as I'm eating the four croissants, as I'm you know drinking five ice caps a day, that I'm heading down this stupor that's going to make my weight go up, my sugar go up, affect my kidneys... but that ice cap feels better than that dialysis I'll have to do 20 years from now. [...] I can totally recognize those same patterns within me with regards to these horrible substances [...] There are 10-15 medications I'm on, I'm super insulin resistant, that's why I think this is a horrible thing. And I know it's a horrible cycle, I know!" [Loretta]

"I feel like the desire is so strong. I know it's not the right choice, just like someone else that's taking alcohol or drugs, I know that having that honey cruller donut at Tim Hortons is not a good idea. I know it's sugar and it's not the right choice but at the time I feel like I have to do it no matter what, I start to convince myself that it's not going to hurt me, it's just a donut, all these thoughts in your head to convince you that it's okay to have the donut, it's okay to eat those French fries, or you know, things that we know are not the right choices." [Sandra]

"I have an ex-husband who was addicted to crack cocaine, but, thinking about my own relationship with food, I can, you know, and what he was going through with that, I won't go to that extreme over food, but I recognize you know certain habits within him that I recognize within myself, with my relationship with food. And it's CRAZY, like who would think, how can you compare crack addiction to food addiction, but you can. The certain behaviours that you do, that are just as detrimental to yourself. I'm not going out and robbing anybody for food, but it's definitely an issue when it's causing you all these health effects." [Joan]

A few participants described putting themselves in unfavourable financial situations to obtain food:

"Like when it comes to this point where like I'm going to be strong, but I really have this craving for this thing, that has happened to me, like I gotta pay the gas bill but I really want this, and I definitely see myself in that position, I've definitely done that." [Joan]

"I'll usually check my bank account first and see what I can move around first and see what I can do or can't do. And then I think about what does my palette need, do I need something salty, sweet, is it just the bite of ginger ale? Then once I check in with those taste buds I start thinking about the cravings I have." [Janet]

Some participants reported withdrawal symptoms when they would try to abstain from certain foods, while others discussed the escalation of intake experienced with FA:

“I feel like I was a sugar addict. [...] when I would go off sugar for a diet, I would get really sick, massive migraines, I would be really fatigued, I definitely had a problem with it.” [Teresa]

“Over the years it just escalates, it wasn’t changing for the better [...] I felt like, it started with a combo, and then it went to a combo and another meal, it sort of increased. It was really bad. [...] like that my stomach was growing like that the amount of food I was able to handle was growing and every time I remember having a combo and a pizza and not being very sickening full.” [Crystal]

Lastly, even though participants recognized that their behaviour resembled other substance-use disorders, and understood the harmful effects of their behaviour, they were still unable to stop it:

“Well, I do definitely think that there is an addiction for me with food, and the reason why I think that is because [pause], I’m still fat [laughter] so something’s off right, something’s wrong. [...] I know what addiction is. And the fact that me, who’s fairly intelligent, you have all this knowledge, definitely have tremendous impacts with regards to your health from your weight, done so many different programs several different times, through the doctor, outside of the doctor, I’ve been overweight pretty much since my 27th year to now, 47th year approaching, and still, we are still in the obesity mark, that’s an addiction, something is wrong there. So, whatever it is, food whatever, something is wrong, and I just need to fix it or resolve it.” [Stacy]

“And you’re trying every day, you’re trying to say, every day in your mind you tell yourself today’s the day that I’m going to stop. But then, you’re in this place where you’re weak, you’re not able, your mind is not ready. You need healing in your mind, to come to some point of a, you know, it’s hard though. You want to commit, you want to do it, you want to go through with it, but really you’re unable to. So then it’s so easy to slide into that, and I feel, like for me eating that made me feel better. And then I would want to continue eating. The worst thing too, if you know the brownies are in your cupboard, the cookies are in your cupboard, the piece of cheesecake is in your fridge, you know it’s there, you want to eat it, and you can’t stop yourself from eating it. [...] You’re like an addict, your behaviour is like an addict.” [Janet]

“I know it’s not the right choice, just like someone else that’s taking alcohol or drugs, I know that having that honey cruller donut at Tim Hortons is not a good idea. I know it’s sugar and it’s not the right choice but at the time I feel like I have to it no matter what, I start to convince myself that it’s not going to hurt me, it’s just a donut, all these thoughts in your head to convince you that it’s okay to have the donut, it’s okay to eat those French fries, or you know, things that we know are not the right choices.” [Janet]

3.3.3.1 Grazing as an Eating Pattern in Food Addiction

Participants recognized compulsive grazing as a pattern of eating in FA:

“If you weren’t addicted you wouldn’t be compulsively grazing. And I think that that’s, you know, like if you think about it, who does that? You’re not hungry you don’t want anything, you don’t need this, but you still go for it. And it’s like why?” [Joan]

“Yeah, pretty much [when asked whether her compulsive grazing feels like an addiction], the snacking throughout the day, I would prefer it I would eat a healthy meal. It’s gotten a lot harder. [...] I crave sweet things. [...] If I’m home I’ll go to the fridge over 10 times a day [...] every half an hour.” [Natasha]

Some participants thought that compulsive grazing could begin as a behavior distinct from FA and eventually progress to FA. They shared how compulsive grazing can develop into an addiction, and that this progression can vary due to individual factors.

“If you smoke every day after dinner let’s say, and you do it without thinking whether you want that cigarette. So every day at this time you have a snack, and you do it without thinking whether or not you need that snack, and that makes it harder to give up.” [Chelsey]

“I think that people can graze themselves into addiction. Cause, and again, it’s one of those things where its mind over matter. Sometimes it’s just a matter of having a major life event that, that changes you into becoming this compulsive grazer, and if you don’t recognize that within yourself, then yeah. And again because we have advertisements everywhere, and it’s funny, if you really think about it, anytime you have a major life event, and you celebrate it, you celebrate with food, you go to a wedding you celebrate with food, you go to a graduation, birthday parties, holidays, whatever. So you know, I think that we live in a society that causes people, there’s a reason why the majority of adults are overweight, it can’t just be by chance. Our society puts us in a position where we have these feelings and we have these emotions, whatever the emotion is we do it with food. So it’s so easy to get to that point, yeah you’re definitely, it’s almost like were being conditioned to wanting to graze and then eventually you know it turns into your addiction.” [Joan]

Most notably, there were participants that felt they had FA, and compulsively grazed, but had no history or presence of binge eating. For example:

“I can’t tell you that I sit down and eat a whole big meal, but you see some people with a big plate that’s not me. But I will graze throughout the day, and what am I grazing? Chips here, chocolate bar there. A meal here, it’s continuous eating throughout the whole day from start to finish, coffee here, or coffee there.” [Stacy]

“I used to eat a lot of chocolate, a lot of sweet, to the point, I was having like at least 2-3 chocolate bars a day, if not chocolate I would have a cookie, not 1 cookie a lot of cookies. They gave me comfort I think. [...] cozy feeling in having sugar, I felt nice, my body felt really really nice. [...] I used to finish a whole box of cookies, [...] watching TV and you’re mindlessly eating. But I don’t have a binge eating disorder. [...] I would eat till I feel full.” [Charlene]

3.3.4 Category 2 Discussion

All participants articulated their experiences with FA in terms that align with the substance-use disorder criteria in the DSM-5 (American Psychiatric Association, 2013). This evidence adds to the prevailing notion that FA represents a substance-based – rather than a behavioural – condition (Schulte et al., 2017). Participants reported repeated failed dieting attempts, tolerance, overeating despite experiencing negative health and financial consequences, interference with role obligations, LOC, and withdrawal. These symptoms parallel the substance-use disorder criteria in the DSM-5 of having repeated unsuccessful attempts to quit, tolerance, use despite adverse consequences, giving up important social, occupational, or recreational activities because of substance use, and withdrawal. Participants in other qualitative studies also described substance-use disorder related symptoms when asked about their experiences of FA and equated it to having a drug addiction (Curtis & Davis, 2014; Ifland et al., 2015; Malika et al., 2015). Notably, LOC has emerged as a central feature of addictive-like eating in other qualitative studies (Cullen et al., 2017; Ruddock et al., 2015).

Our participants with FA also used food to cope with negative emotions, finding “comfort” and “numbing” effects. Interestingly, eating in response to negative emotions was the most prominent theme in Wattick et al.’s (2023) qualitative study, and themes surrounding emotional eating have been identified in other qualitative studies of individuals with FA (Lacroix & von Ranson, 2020; Paterson et al., 2019; Schiestl et al., 2022). Using food to cope with

negative emotions mirrors patterns in other substance-use disorders, where individuals use substances to foster positive feelings or to mitigate negative ones (Koob, 2015). For example, negative urgency – the tendency to act impulsively under distress – and poor emotion regulation are associated with increased binge drinking (Smith & Cyders, 2016). Therefore, treatment options which address emotional factors which tend to foster overeating should be considered to help reduce FA symptoms and weight.

Some argue that the legality, accessibility, and non-intoxicating qualities of highly-processed foods result in fewer personal, social, and occupational disruptions compared to other substance-use disorders – a factor that causes debate about the classification of FA as a genuine substance-use disorder (Rogers, 2017; Ziauddeen et al., 2012). However, we argue that this should not negate the addictive capacity of hyper-palatable foods. Our participants repeatedly described distress and impairment related to weight gain, negative self-image and worth, and deteriorating health arising from their compulsive overeating. Having FA interfered with their daily role obligations and activities. For example, one participant recalled her inability to play with her daughter due to her weight, while another shared her self-imposed month-long isolation due to shame from rapid weight gain. Despite these experiences, many of our participants were still unable to modify their eating behaviors to alleviate their distress. Similarly, participants in Lacroix et al.'s (2019) study highlighted the substantial distress and interference addictive-like eating had on their personal relationships, work efficiency, emotional well-being, and overall health. Participants in Morelife et al.'s (2019) study avoided social gatherings to obtain food, and isolated themselves due to real or imagined judgement from others. Such behaviours underscore the overwhelming power food has on these individuals, even when faced with significant negative consequences.

It should be emphasized that other addiction disorders, like nicotine dependence, may also cause minimal interference with daily living yet are clinically recognized substance-use disorders. Individuals with nicotine dependence rarely neglect their daily responsibilities since smoking is legal and acceptable in social and occupational (e.g. going for a smoke break) environments (Shmulewitz et al., 2011). Interestingly, the tobacco industry once downplayed the addictive nature of nicotine on the grounds that it does not induce intoxication (Roh, 2018). Similarly, while the consumption of ultra-processed foods does not cause significant changes in cognitive functioning, motor skills, or decision making, their addictive potential and long-term impact on health should not be overlooked.

Lastly, there was no ambivalence from any of our participants regarding the recognition of FA as a legitimate condition. In fact, those with FA were willing and enthusiastic to discuss their struggles. Some have argued that recognizing FA as a genuine condition may increase stigma and discrimination against individuals with obesity (O'Brien et al., 2020; Ruddock et al., 2015). There are also concerns that acknowledging FA could result in unwarranted labeling of affected individuals (O'Brien et al., 2020; Ruddock et al., 2015). Notably, individuals with conventional substance-use disorders face significant social stigma, which can exacerbate their distress and impairment (Yang et al., 2017). However, others argue that accepting FA as a legitimate condition can aid in de-stigmatization, by fostering understanding and empathy, and providing resources and support for those in need (Cassin et al., 2019; Nordmo et al., 2020; Weintraub et al., 2023). Similarly, it seems that participants in this study would be open to discussing their struggles with FA with healthcare professionals, as indicated by their openness during the interviews – however this was not directly inquired. This is crucial given the inefficacy of many existing obesity treatment programs (Nordmo et al., 2020; Weintraub et al.,

2023). In accordance, Latner et al. (2014) found that applying the addiction framework to excessive food intake led to reduced stigma against individuals with obesity, whereas a model centered on personal responsibility increased it.

3.3.4.1 Grazing in Food Addiction

A notable finding in our study was that individuals with FA displayed varied eating patterns: some binged, others grazed, while a subset alternated between the two. For these individuals, more severe emotions (e.g. depression) triggered binge-eating, and as the emotions subsided, their behaviour shifted towards grazing. They continuously oscillated between both eating patterns. Interestingly, two of our participants with self-identified FA had clinical BED and engaged in compulsive grazing. Similarly, Paterson et al. (2019) observed a substantial but incomplete overlap between addictive-like eating and binge eating – some participants in their study exclusively grazed. However, they did not conduct diagnostic interviews to confirm BED diagnoses. In addition, a recent study indicated that individuals with FA displayed both binge eating and grazing behaviours, but clarity was missing on whether these patterns coexisted or were distinct within the same individual (Legendre & Bégin, 2023). Therefore, our research uniquely reveals that individuals with FA may transition between binge eating and compulsive grazing behaviors, and that BED-diagnosed individuals with FA can also engage in compulsive grazing.

These findings shed light onto previous conceptualizations of FA, which have always identified it as the endmost point on an overeating spectrum (Conceição & Goldschmidt, 2019; Davis, 2013c; Wilson et al., 2021). Such conceptualizations are important since they acknowledge the considerable overlap between BED and FA. Similarly, Conceicao et al. (2019) proposed a continuum of overeating behaviours based on LOC and eating-related

psychopathology, that ranges from non-compulsive grazing at the lowest end, followed by compulsive grazing, subjective binge eating, and objective binge eating at the highest end (resulting in largest amounts of food eaten per episode). While it is appropriate to conceptualize problematic overeating on a spectrum of severity, and while the transition from compulsive grazing to binge eating/BED to FA may adequately describe some experiences, it does not represent all. Some with FA may exclusively engage in compulsive grazing, or experience binge eating and compulsive grazing concurrently. Therefore, we propose an alternative conceptualization of FA, in addition to the existing overeating spectrum model, as illustrated in Figure 2. Such a conceptualization has significant implications for FA treatment and prevention. If compulsive grazing is a prevalent eating pattern among those with FA, it behooves clinicians to screen for FA when this eating pattern is observed. Similarly, if grazing can evolve into BED and eventually FA, then early screening and intervention for grazing could serve as a vital preventive measure. In other words, compulsive grazing should not be regarded in treatment settings as simply a mild form of compulsive overeating.

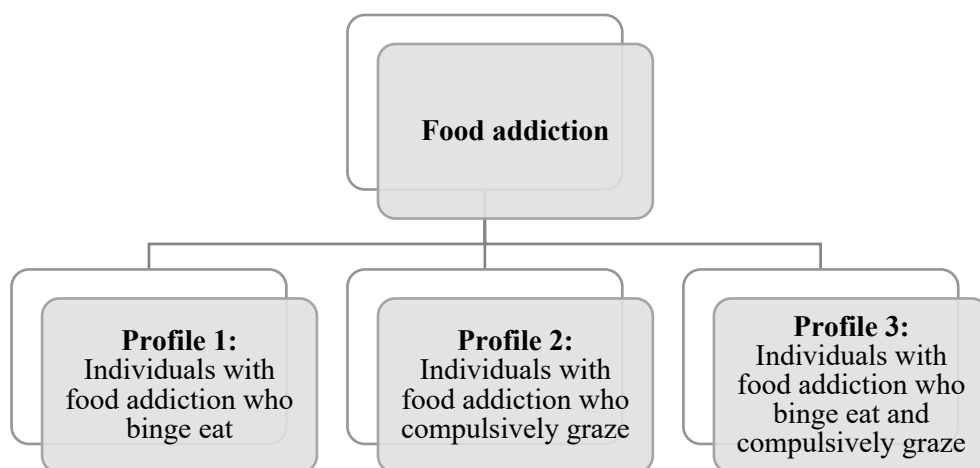


Figure 2. Eating pattern profiles in individuals with FA. This figure represents the various eating profiles present in individuals with FA. The first profile represents individuals with FA who only binge eat, while the second represents those who only compulsively graze. The last profile represents individuals who oscillate between both eating patterns, likely depending on their mood.

3.3.5 Category 3: Potential Treatment Options for Compulsive Overeating

Before conducting the interviews, the PI/interviewer was unaware of the prevalent use of Ozempic®/Saxenda® and bariatric surgery amongst participants. However, it became evident that many participants who had undergone these treatments found them effective in reducing their compulsive overeating tendencies. Notably, while these treatments were primarily intended for weight loss, they also reduced cravings and compulsions. This prompted the decision to share these accounts as potential treatment options for compulsive overeating.

Participants who had been prescribed Ozempic®/Saxenda® experienced a noticeable reduction in their cravings, improved control over their eating habits, and decreased preoccupation with food:

“Before [Ozempic] I felt like an addict needing a cigarette, like the second I took that first drag, I was hooked on it. Now [while on medication] I don’t even think about it.”
[Yolanda]

“Before I could eat 10 cookies, now I eat one, [...] before, the second I took a bite of food there was no moderation, it just didn’t exist for me at all.” [Teresa]

“The only time I was able to feel control was when I was on Saxenda, I was able to, I had no feeling for food, nothing was appealing for me.” [Grace]

“Food was such a big part of my every day. I would track all my meals. [...] I’d drive from work thinking [...] I was sort of always hungry. [...] now [while on medication] I don’t even think about it.” [Yolanda]

Notably, a few participants felt that the effects of Ozempic wore off over time:

“It felt like the effect of the drug was wearing off, my body became immune to it.”
[Deanna]

“When I started the Saxenda, in the beginning, I never got hungry, you kind of have to force yourself to eat, proteins feel so chewy, they’re so difficult to eat, but over time that goes away though.” [Tina]

The effects of post-bariatric surgery experiences were also significant in reducing portion sizes and desires for food. Mainly, the reduced capacity for food intake eliminated the possibility of overeating:

“There’s no more wanting seconds. The volume changed.” [Kathleen]

“Food, bingeing, dysfunctional grazing, wasn’t even on the map because I couldn’t tolerate a tablespoon of water or a tablespoon of apple juice, much less a hamburger and fries.” [Jessica]

Participants who underwent bariatric surgery described experiencing new sensations of pain that had not been there prior to the surgery. Words used to describe this discomfort included: *“sharp pains,” “shoulder and back pain,” “clammy,”* and *“sweaty.”* These sensations differed from the discomfort of overeating they experienced prior to their surgery. This pain acted as a deterrent against overconsumption, prompting them to stop eating before reaching this state of discomfort:

“I used to love food, absolutely love food. I still love food, but nowhere near to the extent that I did [...] the bariatric surgery, it changed a lot, [...] I often feel sick [described feeling nausea], and it’s actually turned me away from food.” [Claudia]

“Before I had the gastric sleeve, I would call it eating past the pain and if you like, eat past the pain, I’ve given it everything I have up to the point where I’m sick and left nothing behind, it was almost like I was striving for that feeling. But now, since I got my gastric sleeve, it’s a different feeling of feeling full, it’s sort of in my chest, I gotta lie down, basically, feeling full is not in my gut, it’s up here [signals to chest] it’s not good, so I have to stop before that feeling kicks in, but it’s still knowing I gave it what I had.” [Maria]

However, it is important to mention that a subset of participants noted that even though they were not able to consume the same amount of food post-surgery, their cravings and urges towards food persisted. This led to a shift in behavior resembling compulsive grazing, where the urges to eat persisted despite the physiological constraints imposed by the surgery. That is, the

compulsive urges, cravings, and lack of control were still present, however consumption had to be smaller.

“But even after surgery people would think that you don't want to eat that stuff but I still want it, I just can't fit it into my stomach, if I could get away with it I would eat it all. [...] The taste of the food in my mouth, it was so yummy, I felt like I was getting ripped off because I couldn't eat any more. You just started to enjoy it but now you can't, I can't do it all at once now. [...] but it's like I'm trying to get there, I can't binge now, but I take baby steps.” [Whitney]

3.3.6 Category 3 Discussion

Participants indicated that bariatric surgery and Ozempic[®]/Saxenda[®]⁷ reduced their cravings and desire to eat. In particular, Ozempic[®]/Saxenda[®] seemed to quiet constant food thoughts. To the best of our knowledge, we are the first to show this association in a sample of individuals with compulsive overeating.

Ozempic[®]/Saxenda[®] are glucagon-like peptide-1 (GLP-1) receptor agonists – they imitate the GLP-1 hormone when eating, creating the feeling of satiety (Crane & McGowan, 2016). GLP-1, released in the gastrointestinal tract and as a neurotransmitter, promotes insulin secretion, reduces glucagon secretion, and, notably, curbs appetite and food consumption (Crane & McGowan, 2016). It also suppresses appetite by slowing gastric emptying (digestion) and decreasing resistance of the anorexigenic hormone leptin (Crane & McGowan, 2016). Common side-effects of GLP-1 include early satiety and nausea (Crane & McGowan, 2016). As a neurotransmitter, GLP-1 is associated with brain areas involved in reward and addiction, such as the ventral tegmental area and striatum (Jensen et al., 2020; Klausen et al., 2022). For example, in animal models, GLP-1 secretion has been shown to reduce drug-related dopamine signaling

⁷ Brand names of injectable GLP-1 receptor agonist medication. Their generic names are liraglutide (Saxenda[®]) and semaglutide (Ozempic[®]).

(Klausen et al., 2022). However, the exact mechanisms by which GLP-1 modulates dopamine function are still unclear (Klausen et al., 2022).

While there has been no specific research on the effects of Ozempic®/Saxenda® on compulsive overeating or FA, studies have suggested their efficacy on improving symptoms of other substance-use disorders (e.g. alcohol-use disorder), although again, the exact mechanism in which they work is not yet understood (Jensen et al., 2020; Klausen et al., 2022). For example, the GLP-1 receptor 168Ser allele variant – associated with reduced expression and mobilizations of the GLP-1 receptor – has been associated with increased alcohol intake in humans (Suchankova et al., 2015). Semaglutide – the key ingredient in Ozempic® – has been shown to reduce alcohol consumption and binge-drinking tendencies in rodents (Chuong et al., 2023). In a randomized, double-blinded, placebo-controlled clinical trial, treatment-seeking alcohol-use disorder patients received exenatide (a generic name for another GLP-1 agonist) or placebo once weekly for 26 weeks, in addition to standard cognitive-behavioral therapy (Klausen et al., 2022). Although there were no significant differences in the overall number of heavy drinking days from the placebo group, those on exenatide experienced decreased alcohol cue reactivity in neurological reward areas including the ventral striatum and septal area (Klausen et al., 2022). Interestingly, in a subgroup of patients with obesity, exenatide significantly lowered both the number of heavy drinking days and total alcohol intake (Klausen et al., 2022). This finding is important because it implies exenatide can reduce the incentive salience of alcohol-associated cues in individuals with alcohol-use disorder. However, low-dose exenatide did not affect cocaine self-administration in individuals with cocaine-use disorder, although the authors emphasized the need for more extensive studies since the drug was only administered once to participants (Angarita et al., 2021). Anecdotal reports from individuals with substance-use

disorders taking drugs like Ozempic® have shown diminished addictive behaviors, primarily attributed to decreased cravings and improved impulse control (Constantino, 2023; Maryland Addiction Recovery Center, 2023; Medaris, 2023; Subbaraman & Hernandez, 2023).

Given that conventional addictive substances and food stimulate the same brain reward pathways, it is plausible that GLP-1 has a similar effect on individuals afflicted with FA (Skibicka, 2013). In support of this theory, animal studies have demonstrated that GLP-1 stimulation reduces the rewarding properties of food (Dickson et al., 2012; Skibicka, 2013). Similarly, a clinical study investigating the effects of a 12-week treatment of semaglutide found a decline in food cravings in 30 participants with obesity (Blundell et al., 2017). Therefore, we support these prior findings that such medications may help manage compulsive overeating, particularly in those who have addictive-like overeating tendencies, by reducing their cravings and desire to eat. However, as our study only provides a preliminary qualitative connection, further investigations are warranted to confirm these findings.

It is important to mention that a few participants in our study reported reduced effectiveness of Ozempic®/Saxenda® over time, with cravings and appetite returning – a sentiment echoed by clinicians regarding prolonged use of these drugs (Sloat, 2023). Moreover, a study looking at treatment withdrawal of semaglutide in 327 participants found that participants regained two-thirds of the weight they had previously lost, and their cardiometabolic improvements reverted to baseline values (Wilding et al., 2022). The authors concluded that sustained treatment is required to retain weight and health benefits (Wilding et al., 2022). However, the significant out-of-pocket expenses involved may not be sustainable long-term for some patients (Mazumder et al., 2023).

Most of our participants also experienced reduced food cravings following bariatric surgery. The discomforts of nausea and ‘dumping syndrome’⁸ deterred them from eating. Similarly, participants in Morelife et al.’s (2019) study who were about to undergo bariatric surgery viewed it as a solution to their FA. Patients who had undergone bariatric surgery showed a reduction in cravings 6 months post-operatively (Jabbour et al., 2021). However, like with the medications described above, a few of our participants did not report a drop in cravings following surgery. Accordingly, different eating disorders and behaviours – such as BED and/or LOC – have been associated with weight regain in post-bariatric surgery patients (El Ansari & Elhag, 2021). Saunders (2004) found that pre-operative patients with BED adopted a compulsive grazing pattern of eating 6 months after bariatric surgery. Similarly, approximately 60% of pre-operative patients with BED started grazing 1 year after surgery, and 94% of pre-operative grazers maintained this behavior post-operatively (Colles et al., 2008). Lastly, a three-year study following 844 bariatric surgery patients (81% women) reported a significant increase in binge eating, emotional eating, and LOC eating one year after surgery, with these eating behaviours persisting at year three (Nasirzadeh et al., 2018). Notably, continuous consumption of large amounts of food can increase gastric capacity, requiring more food for satiety over time (El Ansari & Elhag, 2021).

3.3.6.1 Clinical implications

Abstinence is currently the primary treatment for substance-use disorders, even though relapse is high (Volkow, 2020). This may occur, in part, because individuals often underestimate their consumption and overestimate their ability to manage their substance use (Hammarlund et al., 2018; Paquette et al., 2022). A qualitative study of individuals seeking substance-use disorder

⁸A condition in post-bariatric surgery patients in which food, especially food high in sugar, moves through the digestion tract too quickly causing severe abdominal cramping (Mayo Clinic, 2022).

treatment found that all but one held negative views towards abstinence-based treatment methods (Lee & O'Malley, 2018). In the context of FA, abstinence-based models also exist, as evidenced by self-help programs like Overeaters Anonymous and Food Addicts Anonymous which require abstinence from refined sugar, flour, and wheat (Food Addicts Anonymous, 2023; Overeaters Anonymous, 2014). Moreover, many commercial weight-loss programs impose stringent caloric restrictions and necessitate the avoidance of high-calorie foods – this also informally resembles an abstinence-based approach (McEvedy et al., 2017). Such programs have proven to be largely ineffective (McEvedy et al., 2017). Similarly, participants in our study expressed hesitancy about being able to completely abstain from highly palatable foods, particularly given their widespread availability. The ubiquity of food cues (e.g. from billboard ads, commercials, smells coming from restaurants) makes abstinence much harder in FA than for other substances. For example, participants in Collins et al.'s study (2021) reported that environmental triggers increased their urge and rationalization to eat. In accordance, enforced abstinence has been shown to increase the probability of individuals choosing high-sugar and -fat foods, such as chocolate (Oliver et al., 2000).

Similarly, in the field of compulsive overeating, mindfulness practices have been frequently advocated as potential therapeutic options (Wattick et al., 2023; Malika et al., 2015; Welling et al., 2019). However, we argue that true mindfulness is difficult to attain for those who feel uncontrollable compulsive urges to eat, to the point of considerable distress. Similarly, Wilson et al., (2021) found negative associations between trait mindfulness and impulsivity, grazing, and binge eating. Many of our participants struggled with their weight for years, and only found solace through surgery or medication – abstinence or mindfulness was not attainable for them. This suggests that prevalent treatment strategies for obesity and overeating disorders

are woefully inadequate for people who have a complex and pathological relationship with food, as seen in this study. It is in such cases, that therapeutic interventions may need to encompass surgical or pharmacological options.

3.3.7 Strengths, Limitations, and Future Directions

A significant strength of this research is its large sample size for a qualitative study. Given that many individuals with substance-abuse issues often refrain from seeking treatment (Hammarlund et al., 2018; Paquette et al., 2022), it is reasonable to infer a similar trend in the context of FA. Future qualitative research could emulate our recruitment approach by targeting participants from weight-management settings, who may be unaware of – or have not accepted – their underlying condition of FA. Another important strength of our recruitment strategy was that we aimed to represent a spectrum of individuals with compulsive overeating tendencies (i.e. compulsive grazing, binge eating, BED, and FA), and also included a control group, which permitted their comparison.

Several strategies were also implemented to enhance the trustworthiness of our findings, which included prolonged engagement, persistent observation, triangulation, peer debriefing, member-checking, keeping an audit trail, and reflexivity (see Table 9 for a detailed explanation on how these strategies were implemented). We collaborated with a patient advocate to ensure that the research materials and questions were likely to resonate with the population from which we were recruiting participants. Pilot interviews were also conducted with a scientist experienced in qualitative research in individuals with obesity and BED, and with volunteers from an online FA support group. To increase uptake and acceptability, future qualitative studies should similarly engage relevant stakeholders (e.g. clinicians, individuals with FA and/or obesity)

throughout the research process. For example, researchers can involve stakeholders in the study design process as we have done, and/or gather feedback during analysis.

Despite the strengths of this research, it is important to address some limitations. First, as with all qualitative research, the knowledge and experiences of the researchers may have influenced the interpretation of participants' responses. As such, we encourage other researchers to explore our research questions to reduce the impact of researcher bias. Participants in our study were exclusively female, with obesity, and seeking weight-management treatment. While transferability is not the primary goal of qualitative research, we still advise readers to interpret the findings with caution, especially when relating them to males, given the sex-related differences in addiction and eating (Becker et al., 2017; Davis & Bonder, 2022; Osadchiy et al., 2019; Quigley et al., 2021). Accordingly, future research incorporating male perspectives would be valuable. Our participants also resided in, and attended, a weight-management clinic in Ontario, which may limit the generalizability of our findings to other contexts. While using a weight-management clinic helped greatly with recruitment, we cannot ascertain that our insights apply to individuals not actively pursuing weight management or living in other regions or countries, given that cultural variations exist in eating disorders and other addictions (Egbert et al., 2022; Evans et al., 2017; Mennis & Stahler, 2016; Pike et al., 2014). Therefore, a critical next step would be to qualitatively understand how compulsive grazing, binge eating, and FA behaviours manifest across diverse populations settings and cultures, particularly outside of North America.

Lastly, we feel that our findings on the relationships among grazing, binge eating, and FA, reflect only an initial understanding of these associations. There are many remaining questions that we encourage researchers to explore. Regrettably, we were unable to determine

how long the progression takes from grazing to binge eating to FA, or why some do not appear to follow this progression. It would also be worthwhile examining whether individuals resort to compulsive grazing as a compensatory mechanism for binge eating, especially when they feel inhibited or embarrassed to binge. Further research could also explore how grazing fits within the broader scope of problematic overeating, and whether the concept holds clinical utility in those with FA as it did in our sample. Importantly, the relationship between Ozempic[®]/Saxenda[®] and FA is yet to be studied experimentally, particularly through a randomized-control trial. Therefore, we urge these findings to be interpreted with caution until more comprehensive research is done.

3.4 Summary

This study is the first to provide details on compulsive grazing through participants' perspectives with compulsive overeating tendencies, including BED and FA. Specifically, participants described grazing approximately every 30 minutes to 2 hours, and that it involves casual eating with intermittent pauses between bites. Emotions, cravings, and LOC play key roles in driving this behaviour, although the intensity of emotions during binge eating were perceived as more severe. We also added to existing qualitative literature which likens FA to other substance-use disorders. One of our most notable findings was the varied eating behaviors present among FA individuals: some binge eat, others graze, while a few exhibit both behaviors. We proposed a new conceptualization of FA to explain this. Lastly, our participants identified bariatric surgery and Ozempic[®]/Saxenda[®] as promising interventions to curb food cravings and compulsive urges to eat.

As previously mentioned, QD research seeks to extract meaningful clinical insights from participants' experiences. We therefore hope that our findings help inform and reform treatment

options available for individuals like our participants, so that they can receive more compassionate and tailored care. We also hope that our research contributes to solidifying the legitimacy of FA as a *bona fide* addiction, requiring formal clinical recognition.

CHAPTER 4: OVERALL DISCUSSION AND CONCLUSIONS

This dissertation consisted of two sequential studies, using a multi-method approach – a quantitative study followed by a qualitative study. The following section will first discuss the value of integrating multi-method approaches in health-science research. It will then discuss how the first study informed the second, and examine how the outcomes of both studies complement one another.

Quantitative methods primarily use deductive reasoning to test hypotheses and explain relationships (Wasti et al., 2022). Quantitative methods are rooted in positivism – the belief that reality is objectively measured and observed (Haig, 2012). Quantitative research is useful in minimizing confounding data through procedures like using large samples, which lead to more generalizable findings (Wasti et al., 2022). It remains the predominant approach in health research (Wasti et al., 2022). However, quantitative methods are less effective for understanding complex phenomena with social, cultural, and personal dimensions (Wasti et al., 2022). In contrast, qualitative research is based on an interpretive perspective, which recognizes multiple, subjective realities influenced by individual perspectives, contexts, and meanings (Fossey et al., 2002). Qualitative research focuses on capturing diverse views, beliefs, and meaning, and emphasizes the importance of context in interpreting phenomena (Fossey et al., 2002). It also considers the impact of the researcher and research setting on the data, and allows for the generation of new insights beyond pre-established hypotheses (Fossey et al., 2002). Qualitative research is useful in determining whether health-related concepts are being understood as expected (Wasti et al., 2022). This is particularly important when trying to understand conditions such as FA, which have been established on validated self-report measures created by experts, rather than by individuals directly experiencing the condition.

Multi-method research combines the strengths of both quantitative and qualitative approaches by addressing the limitations of each (McKim, 2015). The underlying assumption of multi-method research is that certain research questions can be more thoroughly explored through a combination of quantitative and qualitative methods than by either approach alone (McKim, 2015). In health research, using multiple methods is particularly useful for integrating patient-focused priorities with scientific rigour (Regnault et al., 2018). By incorporating patient perspectives, multi-method research helps ensure alignment of patient needs and priorities (Regnault et al., 2018). However, multi-method research is not as commonly used in health-related research as it is in other areas, like the social sciences (Wasti et al., 2022).

In this dissertation, the quantitative study showed that both grazing and binge eating contributed significantly to the symptom count of FA. Grazing was also a significant predictor in the logistic regression model (FA diagnosis). Although binge eating was not significant in the logistic regression model, this was attributed to possible power limitations. These results are notable since they are the first to show an association between compulsive grazing and FA in a clinical sample of individuals with obesity. They also show that FA can comprise various overeating behaviours. However, the reliance on a cross-sectional survey meant it could only provide a snapshot of these complex behaviors, lacking depth in understanding the personal experiences and perceptions of those affected. For example, prior to this dissertation, the understanding of compulsive grazing was limited to a self-report survey developed by bariatric-surgery experts. In general, quantitative measures are confined by predetermined questions and scoring criteria, restricting the scope of information that can be collected (Trafimow, 2014). Cross-sectional surveys only provide a ‘snapshot in time’ (Sanchez et al., 2023). Such

information is limited since it does not capture the complexity and nuances of an individual's experience.

Therefore, to build on our quantitative findings, we believed an important step forward was to qualitatively understand compulsive grazing, and its relationship to BED and FA. Particularly, it was important to understand how individuals with obesity, who have compulsive overeating tendencies, perceive their compulsive grazing. It was also important to understand how compulsive grazing is differentiated from binge eating, and where compulsive grazing fits within the spectrum of overeating. It was critical to gain this information since BED and FA are still being conflated as the same condition. Addressing these nuanced questions, for which the answers were not attainable through the quantitative study, was essential for a deeper understanding of these eating behaviours.

In addition, the ongoing debates over the validity of the FA construct suggest that existing quantitative studies – which form the majority of FA research – have not yet fully demonstrated their clinical value. It has been argued that the introduction of a new clinical concept requires empirical demonstration of its clinical utility, showing that the advantages of recognizing it outweigh potential negative consequences (First et al., 2004). In other words, statistical models of distress and pathology may not adequately establish the clinical significance of addictive-like eating. For example, only one question in the YFAS focuses on distress. We therefore hoped to increase the validity of FA through qualitative research, by adding to the existing body of 12 qualitative FA studies.

In our qualitative study, all participants felt that the addictive potential of certain foods is a valid concept. Participants with FA described the distress and impairment they experienced with their condition. We found that the same individual may alternate between grazing and binge

eating, and that some with FA only compulsively graze and do not binge eat. It would not have been possible to uncover this in our quantitative survey, we were only able to gain this insight by speaking to individuals who struggle with compulsive overeating behaviours. This was an important finding as it reinforced the view that compulsive grazing should be considered a clinically-relevant behaviour since it is present in individuals with FA. Recognizing that compulsive grazing can be an eating pattern in those with FA also reinforced that BED and FA are unique conditions since not all those with FA binge eat, but exhibit other eating patterns, akin to the different modes of use in other addiction disorders. As such, the qualitative research filled the gaps left in the quantitative study.

Lastly, our qualitative work also revealed that some participants were either taking Ozempic® or Saxenda®, or had undergone bariatric surgery – a detail not previously known from the quantitative data. Interviews with participants indicated that these treatments may aid in reducing compulsive eating urges. The qualitative study is the first to suggest that Ozempic®/Saxenda® could be effective in managing addictive-like eating behaviours and compulsive eating urges. Therefore, the qualitative study uncovered new information about treatment options like Ozempic®/Saxenda® and bariatric surgery for individuals with FA, which was not apparent in the quantitative data. This offered new directions for clinical practice and research.

Overall, the use of a multi-method approach in this dissertation offered a comprehensive understanding of FA and its related behaviors. The quantitative data provided foundational insights using statistical models, while the qualitative research added depth and a nuanced perspective of FA. This holistic approach not only advances our comprehension of FA and associated over-eating behaviors but also underscores the importance of integrating diverse

research methods to fully grasp the complexity of human health issues, particularly when trying to understand a condition that is varied from person to person. It is our hope that this dissertation demonstrates the strength of a multi-method approach in health-sciences research.

Nonetheless, the limitations of this study and multi-method design should also be acknowledged. Importantly, our sample (for both studies) consisted of individuals seeking medical help for weight-loss, which may not reflect the broader population of individuals with overweight or obesity. Moreover, the qualitative sample only comprised women, limiting the generalizability of the findings. In addition, executing multi-method research may require expertise in both qualitative and quantitative research methods, a skill not all researchers have (Halcomb & Hickman, 2015; McKim, 2015). These studies are often more time-consuming, costly, and may require more personnel than single-method studies due to the need to design, collect, and analyze multiple types of data (Halcomb & Hickman, 2015). Integrating data from qualitative and quantitative sources can also be challenging, as the data may not always align neatly, and merging distinct data types to inform a cohesive conclusion can be challenging (Almalki, 2016). For example, in the current study the time gap between the quantitative and qualitative studies hindered our ability to use the survey results from the quantitative study to determine whether our participants still engaged in binge eating or were diagnosed with FA as outlined in the YFAS. While we used this as a preliminary assessment for recruitment, the PI required training to be able to diagnose BED (which took time and resources), and FA diagnoses were based on participant self-identification. Such limitations should be carefully considered when choosing to undergo a multi-method design.

4.1 Conclusion

Through the use of a multi-method design, this dissertation supports the growing call for recognizing FA as a *bona fide* substance-use disorder. While the contributions of this body of work and other excellent and compelling literature over the past 20 years has helped promote the field of FA, continued research and public health efforts are crucial for further progress in this area. Firstly, there should be some emphasis from public health agencies on FA-related prevention strategies, considering that obesity has been deemed a “global epidemic”, and that current lifestyle-change obesity treatments are largely ineffective (Nordmo et al., 2020; Obesity Canada, 2019; Weintraub et al., 2023; World Health Organization, 2021). For example, in addition to ongoing efforts, public health initiatives should also promote education about hyper-palatable foods and emotional-driven eating. Second, and most importantly, future research should work towards creating standardized, universally accepted diagnostic criteria for FA, which would aid in its recognition and treatment within the medical community. Once determined, an appropriate next step would be to establish evidence-based treatments through clinical research. One interesting avenue is the use of pharmacological interventions to help reduce cravings. Given the varied response to treatments among those with addiction disorders, certain interventions may be effective for some individuals but not others.

Currently, general practitioners and endocrinologists often refer patients with obesity and/or concurrent conditions such as diabetes to weight-management clinics or prescribe diet and exercise interventions themselves. This fails to address the underlying issue that certain vulnerable individuals have a difficult time making rational and intentional food choices when hyper-palatable foods and their cues are so ubiquitous. Comprehensive treatment for FA requires focusing on mental-health aspects like emotional eating and addiction-related psychological

issues. Accordingly, healthcare insurance coverage should reflect this need. Currently in Ontario, obesity treatment is government funded. By contrast, mental health services are most often covered by private insurance plans, offering limited coverage of \$400 to \$1,500 annually, equating to 2-8 therapy sessions on average (Moroz et al., 2020). Financial constraint is a leading barrier for Canadians seeking mental health services (Moroz et al., 2020). The inadequate financial support for mental health care does not reflect the good evidence that some individuals with obesity need psychological support to effectively manage their weight and overeating. As such, healthcare professionals in both medical and psychiatric fields need access to up-to-date, research-based information to be able to provide treatment effectively, collaboratively, and holistically for this population.

Such advancements can have a large impact on public health, most importantly on the stigma surrounding obesity, and the availability of treatments for those with FA. Clinical recognition of over-eating as an addictive process may help individuals articulate their internal struggle and powerlessness when trying to abstain from rewarding foods.

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Appendices

Appendix A – Yale Food Addiction Scale

Appendix B – Phone script

Appendix C – Follow-up email

Appendix D – Email with link

Appendix E – Online consent form and demographic questionnaire

Appendix F - Sample qualitative interview questions

Appendix A – Yale Food Addiction Scale
(Gearhardt, Corbin, & Brownell, 2009)

This survey asks about your eating habits in the past year. People sometimes have difficulty controlling their intake of certain foods such as:

- Sweets like ice cream, chocolate, doughnuts, cookies, cake, candy, ice cream
- Starches like white bread, rolls, pasta, and rice
- Salty snacks like chips, pretzels, and crackers
- Fatty foods like steak, bacon, hamburgers, cheeseburgers, pizza, and French fries
- Sugary drinks like soda pop

When the following questions ask about “CERTAIN FOODS” please think of ANY food similar to those listed in the food group or ANY OTHER foods you have had a problem with in the past year

IN THE PAST 12 MONTHS:		Never	Once a month	2-4 times a month	2-3 times a week	4 or more times or daily
1.	I find that when I start eating certain foods, I end up eating much more than planned	0	1	2	3	4
2.	I find myself continuing to consume certain foods even though I am no longer hungry	0	1	2	3	4
3.	I eat to the point where I feel physically ill	0	1	2	3	4
4.	Not eating certain types of food or cutting down on certain types of food is something I worry about	0	1	2	3	4
5.	I spend a lot of time feeling sluggish or fatigued from overeating	0	1	2	3	4
6.	I find myself constantly eating certain foods throughout the day	0	1	2	3	4
7.	I find that when certain foods are not available, I will go out of my way to obtain them. For example, I will drive to the store to purchase certain foods even though I have other options available to me at home.	0	1	2	3	4
8.	There have been times when I consumed certain foods so often or in such large quantities that I started to eat food instead of working, spending time with my family or friends, or engaging in other important activities or recreational activities I enjoy.	0	1	2	3	4
9.	There have been times when I consumed certain foods so often or in such large quantities that I spent time dealing with negative feelings from overeating instead of working, spending time with my family or friends, or engaging in other important activities or recreational activities I enjoy.	0	1	2	3	4
10.	There have been times when I avoided professional or social situations where certain foods were available, because I was afraid I would overeat.	0	1	2	3	4

11.	There have been times when I avoided professional or social situations because I was not able to consume certain foods there.	0	1	2	3	4
12.	I have had withdrawal symptoms such as agitation, anxiety, or other physical symptoms when I cut down or stopped eating certain foods. (Please do NOT include withdrawal symptoms caused by cutting down on caffeinated beverages such as soda pop, coffee, tea, energy drinks, etc.)	0	1	2	3	4
13.	I have consumed certain foods to prevent feelings of anxiety, agitation, or other physical symptoms that were developing. (Please do NOT include consumption of caffeinated beverages such as soda pop, coffee, tea, energy drinks, etc.)	0	1	2	3	4
14.	I have found that I have elevated desire for or urges to consume certain foods when I cut down or stop eating them.	0	1	2	3	4
15.	My behavior with respect to food and eating causes significant distress.	0	1	2	3	4
16.	I experience significant problems in my ability to function effectively (daily routine, job/school, social activities, family activities, health difficulties) because of food and eating.	0	1	2	3	4

IN THE PAST 12 MONTHS:		NO	YES
17.	My food consumption has caused significant psychological problems such as depression, anxiety, self-loathing, or guilt.	0	1
18.	My food consumption has caused significant physical problems or made a physical problem worse.	0	1
19.	I kept consuming the same types of food or the same amount of food even though I was having emotional and/or physical problems.	0	1
20.	Over time, I have found that I need to eat more and more to get the feeling I want, such as reduced negative emotions or increased pleasure.	0	1
21.	I have found that eating the same amount of food does not reduce my negative emotions or increase pleasurable feelings the way it used to.	0	1
22.	I want to cut down or stop eating certain kinds of food.	0	1
23.	I have tried to cut down or stop eating certain kinds of food.	0	1
24.	I have been successful at cutting down or not eating these kinds of food	0	1

25. Please circle ALL of the following foods you have problems with:

Ice cream	Chocolate	Apples	Doughnuts	Broccoli	Cookies	Cake	Candy
White Bread	Rolls	Lettuce	Pasta	Strawberries	Rice	Crackers	Chips
Pretzels	French Fries	Carrots	Steak	Bananas	Bacon	Hamburgers	Cheese burgers
Pizza	Soda Pop	None of the above					

26. How many times in the past year did you try to cut down or stop eating certain foods altogether? 1 time 2 times 3 times 4 times 5 or more times
27. Please list any other foods that you have problems with that were not previously listed:

Appendix B – Phone script

Hello. May I please speak with [_____]?

My name is Revi Bonder and I am a PhD Candidate at York University. I am calling you to tell you about a study that you may be interested in learning more about. The study is being conducted in collaboration with two professors at York University and Dr. Sean Wharton at the Wharton Medical Clinic. The study is a follow-up study to a previous online study that you participated in, and it involves having a conversation about your eating patterns and behaviours. Are you interested in hearing about this project?

If NO: I understand. Thank you. I will not contact you again about this study.

If YES: Great. We are looking learn more about your eating patterns and behaviours. As part of this study, we want to talk with you about your eating behaviours, and particularly about your snacking behaviours, through a virtual video call. The video call will take place on Zoom, and will be tape recorded on an encrypted audio recording. You can choose to not turn on your video camera if you feel more comfortable with that.

The questions are not expected to be embarrassing or personally invasive, and you are welcome to provide as much information as you feel comfortable providing. You can also choose not to answer certain questions if you feel uncomfortable answering them. All information you supply during the research will be held in confidence. Your name will not appear in any report or publication of the research.

Our conversation will take about 60 minutes to complete, and you will receive a small token of appreciation of \$30 by e-transfer.

Are you interested in participating?

If NO: I understand. Thank you. I will not contact you again about this study.

If UNSURE: Would you like more time to think about this study? May I call you back in a few days to answer any questions you may have and see whether you think you would be interested in taking part in the study?

If YES: Great, thank you for agreeing to take part in this study. Before we have this conversation, I would like to ask a few questions about the nature of your overeating, and some pre-screening questions. These questions will help us understand what type of eating behaviours you exhibit.

Are you currently pregnant or breast-feeding?

If YES:

Thank you so much for your interest in this study and for taking the time to speak with me. Unfortunately, we are not recruiting individuals who are pregnant or breast-feeding because of the effects these conditions can have on appetite and food preferences.

Are you between the ages of 20-50 years?

IF YES: Great. Thank you for answering those questions. To participate in this study, we will first need to email you an online questionnaire and consent form. The questionnaire will ask you a few questions about yourself such as your age and ethnicity. This should take 5 minutes to complete. May I email you with a link to our online demographic and consent form? What is your email address? Once you have completed the consent form, I will contact you to set up a meeting time at your earliest convenience.

Did you have any questions?

If you think of any other questions or would like to speak to me about this, please email me at rbonder@yorku.ca and we can set up a time to speak.

Thank you for taking the time to speak with me.

Appendix C – Follow-up Email

Dear *[insert patient name]*,

My name is Revi Bonder and I am a PhD Candidate at York University. I am emailing you to tell you about a study that we are currently conducting at the Wharton Medical Clinic.

The study is being conducted in collaboration with two professors at York University and Dr. Sean Wharton at the Wharton Medical Clinic. The study is a follow-up study to a previous online survey study that you participated in. We are now looking to learn more about your eating patterns and behaviours, and particularly about your snacking behaviours, through a virtual video call over Zoom which will take about an hour. We are offering a \$30 compensation to participants.

Please let me know if you are interested in participating or would like to hear more.

All information you supply during the research will be held in confidence. Your name will not appear in any report or publication of the research.

Sincerely,
Revi Bonder

Appendix D – Email with link

Dear *[insert patient name]*,

We spoke on the phone today about your participation in a study on your eating and snacking behaviours, which is being done in partnership with York University and the Wharton Medical Clinic. During our chat, you had indicated that you were interested in participating in our study. Firstly, I would like to say thank you for supporting this important work!

As we discussed on the call, our next step would be for you to fill in our online consent and demographic form, which can be found here: *[insert link]*.

Once this is complete, I will reach out to you regarding your availabilities for a video call.

Looking forward to chatting!

Sincerely,
Revi Bonder

Appendix E – Online consent form and demographic questionnaire

Informed Consent Form (modified for online use)

Date: [insert date]

Study Name: A Qualitative Analysis of ‘Grazing’ and Compulsive Overeating

Researcher names:

Revi Bonder, PhD Candidate, Principal Investigator
Dept. of Kinesiology and Health Sciences, 223 Bethune College
rbonder@yorku.ca

Dr. Caroline Davis, Professor
Dept. of Kinesiology and Health Sciences, 343 Bethune College

Dr. Jennifer L. Kuk, Associate Professor
Sherman Health Science Research Centre, Rm 2002

Dr. Sean Wharton, Physician (Internal Medicine Specialist)
The Wharton Medical Clinic

Dear Participant,

You are being asked to participate in this research study voluntarily. Before you agree to do this, it is important that you understand the study purpose and procedures, that you be aware of any benefits, risks, or discomforts that may be associated with your participation, and that you understand your right to refuse to participate or withdraw from this study. This is known as the informed consent process. Please ask the researcher to explain anything that you do not understand before signing the consent form, and make sure all your questions have been answered satisfactorily before signing this document.

Purpose of the Research: You previously completed a study designed to investigate the relationship between addictive tendencies towards food and other eating behaviours in adult men and women between 20 to 50 years old. Some of the questions in that study asked you about *grazing*, or repetitive snacking. We would now like to understand more about snacking, and it’s relationship with other eating behaviours, through the personal experiences and viewpoints of our participants. We want to talk with you about your eating behaviours, and particularly about your snacking behaviours.

What You Will Be Asked to Do in the Research: For this study, you will be asked to complete a short online questionnaire (approximately 5 minutes). The questionnaire will ask you a few questions about yourself such as your age and ethnicity. You will also be asked to participate in a 60 minute online video conversation with the researcher. As part of this conversation, the

researcher will ask you a number of open-ended questions related to the topics described above, which you can answer in as much detail as you like – or you can decline to answer if you wish. The interview will be audio recorded on an audio recording device. This data will not be linked with your medical records at the Wharton Medical Clinic, and no names or other identifying information will be mentioned during the interview or linked to your interview.

Risks and Discomforts: We do not foresee any risks or discomfort from your participation in the research. If you have any concerns about the questions you are being asked, please let us know at any point during the study.

Benefits of the Research and Benefits to You: The results of this study may serve to benefit future patients and improve the weight management care provided at The Wharton Medical Clinic and Weight Management Centre.

Compensation: You will receive \$30 via e-transfer upon completing this study.

Voluntary Participation and Withdrawal: Your participation in the study is completely voluntary and you may choose to stop participating at any time. Your decision not to volunteer, to stop participating, or to refuse to answer particular questions will not influence the nature of the ongoing relationship you may have with the researchers or study staff, or the nature of your relationship with York University or the Wharton Medical Clinic either now, or in the future.

By signing this form, you do not give up any of your legal rights. You do not have to take part in this research study. Any decision you make will have no impact on the care you receive at the Wharton Medical Clinic or anywhere else.

If you decide to stop participating, you may withdraw without penalty, financial or otherwise, and you will still receive the promised inducement.

In the event you withdraw from the study, all associated data collected will be immediately destroyed wherever possible. Should you wish to withdraw after the study, you will have the option to also withdraw your data up until the analysis is complete.

Confidentiality:

All information you supply during the research will be held in confidence. Your name will not appear in any report or publication of the research. Online survey data will be downloaded on an Excel spreadsheet. Audio recordings of the interview will be recorded on an encrypted audio recording device.

The researcher(s) acknowledge that the host of the online survey (RedCAP) may automatically collect participant data without their knowledge (i.e., IP addresses.) Although this information may be provided or made accessible to the researchers, it will not be used or saved without participant's consent on the researcher's system. Further, because this project employs e-based collection techniques, data may be subject to access by third parties as a result of various security

legislation now in place in many countries and thus *the confidentiality and privacy of data cannot be guaranteed during web-based transmission.*

This study will use the Zoom Videoconferencing software to collect data, which is an externally hosted cloud-based service. When information is transmitted over the internet privacy cannot be guaranteed. There is always a risk your responses may be intercepted by a third party (e.g., government agencies, hackers). Further, while York University researchers will not collect or use IP address or other information which could link your participant to your computer or electronic devices without informing you, there is a small risk with any platform such as this of data that is collected on external servers falling outside the control of the research team.

Your conversation with the researcher will be recorded on an encrypted audio-recording device, and will be saved in a password protected file on a local computer, not the cloud based service. Please note that it is the expectation that participants agree not to make any unauthorized recordings of the content of a meeting / data collection session.

Data will be stored for 10 years on computerized encrypted files, in a locked office. Only research staff will have access to the study's information. Data will be destroyed after 10 years through deletion from the databases. Confidentiality will be provided to the fullest extent possible by law.

Questions About the Research? If you have questions about the research in general or about your role in the study, please feel free to contact me at rbonder@yorku.ca or my supervisor, Dr. Caroline Davis at cdavis@yorku.ca and/or (416) 736-2100 x 77327. You may also contact the Program in Kinesiology and Health Sciences at kahs@yorku.ca and/or 416-736-5728.

This research has received ethics review and approval by the Delegated Ethics Review Committee, which is delegated authority to review research ethics protocols by the Human Participants Review Sub-Committee, York University's Ethics Review Board, and conforms to the standards of the Canadian Tri-Council Research Ethics guidelines. If you have any questions about this process, or about your rights as a participant in the study, please contact the Sr. Manager & Policy Advisor for the Office of Research Ethics, 5th Floor, Kaneff Tower, York University (telephone 416-736-5914 or e-mail ore@yorku.ca).

Legal Rights and Signatures:

I consent to participate in the study "Addictive Tendencies Towards Food: A Multi-Method Analysis of 'Food Addiction' and Related Psychopathologies" conducted by Revi Bonder, Dr. Caroline Davis, Dr. Jennifer Kuk, and Dr. Sean Wharton. I have understood the nature of this project and wish to participate. I am not waiving any of my legal rights by signing this form. My signature below indicates my consent.

e-Signature
Participant

Date

Additional consent (where applicable)

1. Audio recording

☐ I consent to the audio-recording of my interview(s).

e- Signature _____

Participant Name:

Date _____

Demographic Questionnaire

1. **How old are you?** _____
2. **Educational Background:** (please check highest level obtained)
 - Some elementary school
 - Graduated elementary school
 - Some high school
 - Graduated secondary/high school
 - Some college/technical school
 - Graduated college/technical school
 - Some university
 - Graduated university
 - Other degree (please specify): _____
3. **Please indicate your ethnic background (check all that apply):**
 - Aboriginal (Inuit, Metis, North American Indian)
 - Arab/West Asian (e.g., Armenian, Egyptian, Iranian, Lebanese, Moroccan)
 - Black (e.g., African, Haitian, Jamaican, Somali)
 - Latin American
 - Southeast Asian
 - White (Caucasian)
 - Other (please specify): _____
4. **How many years have you lived in North America?** _____
5. **Do you have any health problems or long-term conditions that have lasted or are expected to last for six months or more?**
 - Yes:
 - If yes, please specify:
 - No
 - Would rather not answer
6. **Are you taking any prescription medication?**
 - a. Yes:
 - i. If yes, please specify:
 - b. No
 - c. Would rather not answer
7. **Do you identify as having a disability?**

- Yes:
 - If yes, please specify:
- No
- Would rather not answer

Appendix F - Sample qualitative interview questions

1. Can you tell me about your relationship with food from childhood to the present time?
 - a. Did you not think much about it, or was it something that was constantly on your mind?
 - b. Have your dietary habits changed from childhood to present time?
2. In your opinion what might have contributed to your challenges with food that motivated you to seek help to control your weight?
3. Could you describe your snacking behaviours?
4. What factors influence your snack choices?
5. Can you describe what you are thinking or feeling before you grab a snack?
6. Can you describe what you are thinking or feeling after you grab a snack?
7. Was there ever a time when you were snacking where you wanted to stop but you kept going?
8. Have you ever felt that food may be very pleasurable or addictive?
9. Do you think that snacking on foods can become very pleasurable or addictive?