FOOD ADDICTION AND OBESITY

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Abstract:

Food addiction has been vastly studied and associated with obesity. Therefore, this paper aims to analyze past studies concerning food addiction and its relationship with obesity. Most studies found that food addiction has significant correlation with obesity. The analysis revealed the strength of studies is through the diverse methodologies implied to gain data. However, most studies have limited generalizability and heavily rely on cross-sectional methods. The application of the literature to the current issue is discussed from clinical, educational, and policy aspects. Islamic perspective is also discussed, emphasizing moderation, self-control and spiritual acts as in prayer and fasting.

Keywords:

Food Addiction, Obesity, Literature Review, Islamic Perspective

Background

Food intake is fundamental to human functioning, yet contemporary food environments increasingly promote patterns of overeating that resemble compulsive, addiction-like consumption. In parallel, obesity has become a major global public health challenge: the World Health Organization (WHO) estimates that in 2022, 2.5 billion adults were overweight and 890 million were living with obesity (World Health Organization [WHO], 2025). Forecasting work from the Global Burden of Disease Study suggests the burden will continue to rise without effective intervention; under continuation of historical trends, the number of adults living with overweight and obesity is projected to reach 3.80 billion by 2050 (GBD 2021 Adult BMI Collaborators, 2025). These trajectories underscore the urgency of understanding dietary drivers that extend beyond nutrient composition alone, including the structure of modern diets dominated by ultra-processed foods (UPFs).

A growing body of evidence implicates UPFs—industrially formulated products typically designed to be convenient, highly palatable, and easy to consume—in promoting excess energy intake and weight gain through behavioural and physiological pathways (Dicken & Batterham, 2024). Recent controlled feeding trials have strengthened causal inference by demonstrating that diets higher in UPFs can increase energy intake and body weight in relatively short timeframes. For example, in a randomised, open-label crossover study, consumption of UPFs (compared with non-UPF foods) was associated with weight gain and higher ad libitum energy intake, with reduced chewing frequency proposed as one behavioural mechanism that may facilitate overeating (Hamano et al., 2024). In a free-living randomised crossover trial designed around healthy dietary guidance, adults provided with minimally processed versus ultra-processed diets aligned to the UK Eatwell Guide lost weight on both diets, but achieved significantly greater weight loss on the minimally processed diet, suggesting that food

processing level can shape outcomes even when general "healthy eating" principles are followed (Dicken et al., 2025).

Within this context, the construct often discussed as "food addiction" has increasingly been operationalised as ultra-processed food (UPF) addiction, reflecting addiction-like patterns of consumption that cluster around hyper-rewarding, highly processed products (LaFata et al., 2024). Contemporary synthesis indicates that UPF addiction can be measured reliably using validated symptom-based scales and is not a rare phenomenon: recent estimates suggest a global prevalence of approximately 14% among adults and 15% among youths (LaFata et al., 2024). Importantly, proposed mechanisms extend beyond simple "lack of willpower" narratives and include interactions across reward learning, appetite regulation, and the brain–gut–microbiome axis, alongside emerging discussion of withdrawal-like experiences when individuals attempt to reduce intake of certain UPFs (LaFata et al., 2024). These mechanisms are clinically relevant because they may help explain why some individuals experience persistent cravings, loss of control, and repeated relapse despite awareness of adverse health consequences.

The relationship between UPF addiction and obesity is therefore best conceptualised as probabilistic rather than deterministic, thus, not all individuals with obesity meet symptom-based criteria for addiction-like eating, and not all individuals with UPF addiction have obesity at a given time. However, because addiction-like patterns can increase the likelihood of sustained energy overconsumption, reduce dietary quality, and undermine long-term weight management, UPF addiction may represent an important behavioural phenotype within the broader heterogeneity of obesity (Dicken & Batterham, 2024; LaFata et al., 2024). Clarifying this relationship has direct implications for prevention and intervention, including how clinicians tailor behavioural strategies, how communities design supportive environments, and how policymakers regulate marketing and availability of hyper-palatable, heavily processed products (Dicken & Batterham, 2024).

Finally, there is growing recognition that culturally grounded approaches can strengthen public health responses to diet-related disease. Faith-based settings, including mosques, have been identified as promising venues for health promotion because they can reduce access barriers, increase trust, and align behaviour change with values-based motivation (Abu-Ras et al., 2024). Complementing this, qualitative research highlights the potential role of Islamic scholars (imams) in encouraging healthier lifestyles, including physical activity and prevention-oriented behaviour, within Muslim communities (Safi et al., 2025). Scholarship integrating Islamic dietary ethics with contemporary health science also emphasises moderation and holistic wellbeing as culturally resonant entry points for improving eating behaviours (Fauzi et al., 2024). Accordingly, an integrated review that synthesises biological, psychological, and sociocultural evidence—alongside Islamic perspectives—may offer a more comprehensive framework for understanding and addressing UPF addiction and obesity.

This review synthesises evidence from recent literature to examine the relationship between addiction-like consumption of ultra-processed foods and obesity, with attention to biological, psychological, and sociocultural mechanisms, and with applied reflection on Islamic ethics and community-based health promotion. The goal is to inform future clinical, educational, and policy-oriented strategies that are both evidence-based and culturally responsive

Methodology
This review utilized a comprehensive and structured search strategy to compile and extract data from a collection of relevant papers published between 2020 to 2024. The academic search engine, such as Google Scholar, PubMed, Wiley Online Library and ScienceDirect was used to search for the papers. For this review, the keywords involved were; "food addiction," "obesity," "overweight individual," "eating behavior," and "obese individual" and these keywords were used to search for papers of interest. To further specify the focus area, Boolean operators (AND, OR) were applied during the search procedure.

Inclusion and Exclusion Criteria
Relevant research papers were included for this review including both human and mice subjects. This inclusion criterion was employed to enlarge the scope of biological and neurological findings related to food addiction and obesity. All grey literature, unpublished works, dissertation and theses were excluded from the review to limit the scope of literature collection. To ensure in-depth understanding of the data, only papers published in the English language were included.

Data Extraction
For data extraction, a systematic form was developed. The main elements extracted were the objective(s) of study, participant details, instruments used and findings from each study. Another important element was the limitations for each study which will inform future research improvements.

Results
Across the included studies, food addiction (FA) was predominantly operationalised using the Yale Food Addiction Scale (YFAS) family (including YFAS 2.0). Overall, FA showed more consistent associations with dysregulated eating phenotypes and psychological distress than with adiposity per se; links with BMI and obesity indicators varied by setting (clinical vs community), population characteristics (e.g., age, treatment-seeking), and comorbid eating pathology (notably binge-eating disorder).

Human Observational Findings
Morbid obesity in specialised care. In a German adiposity-centre sample of patients with morbid obesity (N = 112), Schankweiler et al. (2023) assessed FA with YFAS 2.0 and examined clinical and behavioural correlates. FA was not associated with BMI and was also unrelated to BMI reduction during a weight-loss programme and to programme withdrawal, indicating that addiction-like eating symptoms may not be reliably indexed by BMI within treatment-seeking severe obesity. Limitations included modest statistical power relative to multiple tested correlates (risking type I/II error) and concerns about the reliability of some derived eating-behaviour sum scores.

Young adults from community settings. In India, Sukesh et al. (2024) studied urban and rural young adults (N = 480; mean age ≈ 21.6 years) using a cross-sectional design and YFAS. FA prevalence was higher in the urban sample than the rural sample (16.7% vs 11.7%), and FA was positively associated with anthropometric indicators of obesity. Generalisability may be constrained by geographically bounded recruitment, and interpretation would benefit from more extensive reporting of local psychometric performance for translated instruments.

Psychological profiles within obesity. In Lebanese adults with class I obesity (N = 507), Brytek-Matera et al. (2021) profiled participants by psychological distress, eating behaviours, and physical activity. Higher FA scores clustered with maladaptive eating (emotional and uncontrolled eating) and greater psychological distress, whereas higher physical activity related to lower FA scores. Residual confounding (e.g., unmeasured clinical comorbidities) and snowball sampling limited inference beyond the surveyed population.

Overweight/obesity without bulimia nervosa or binge-eating disorder. Pape et al. (2021) reported FA in 15% of adults with overweight/obesity (N = 213) and found that FA severity correlated positively with BMI and with psychological distress (depression/anxiety) and maladaptive eating tendencies (emotional and impulsive eating). These findings converge with the broader pattern that FA is embedded within a distress–dysregulated eating constellation, although directionality cannot be established from cross-sectional designs.

FA, binge-eating disorder (BED), and depression. In an Italian clinical sample of adults with obesity (N = 303), Carbone et al. (2023) assessed FA using the Italian YFAS 2.0 and examined relationships between FA, BED, and affective symptoms using network analysis. FA showed a strong positive association with BED and eating-disorder psychopathology, while the direct FA–obesity relationship was comparatively weaker; depressive symptoms appeared influential within the network of pathological eating variables.

BMI strata and risk factors. Case–control studies comparing BMI categories generally reported higher FA prevalence with higher BMI; however, findings were sensitive to methodology, including reliance on BMI without body-composition measures and limited assessment of diet characteristics and food environments. Variation in YFAS versions (and local validation status) further complicates cross-study comparability.

Anthropometrics beyond BMI and impulsivity traits. In a large Canadian community sample (N = 1,432), Minhas et al. (2021) found that obesity was associated with higher likelihood of FA (YFAS 2.0). FA severity correlated with BMI and with multiple body-composition and circumference measures (including visceral fat indices and waist/hip/neck circumferences), and was associated with impulsive personality traits. In contrast, behavioural task indices of inhibitory control (go/no-go) and delay discounting were not consistently associated with FA symptoms, suggesting that trait-like impulsivity may be more salient than laboratory task performance in this context.

Neurobiological And Experimental Findings
Relapse propensity independent of obesity susceptibility. Horton et al. (2023) used an operant self-administration paradigm for high-fat/high-sugar food and applied a DSM-5-informed "three-criteria" addiction-like model in obesity-prone and obesity-resistant C57BL/6J mice. Addiction-like behaviour did not differ by obesity susceptibility, but higher addiction-like responding predicted greater relapse propensity, supporting the interpretation that relapse vulnerability may be a core feature of addiction-like eating even when obesity status differs. Transferability to humans and the limited neurobiological interrogation were key limitations.

Resting-state functional connectivity and sex-related patterns. Ravichandran et al. (2021) examined resting-state fMRI connectivity in adults with BMI $\geq$ 25 kg/m² (N = 150) and reported greater connectivity in reward-related networks among individuals with FA, alongside sex-related patterns suggestive of differential engagement of salience/emotion-regulation and executive/default-mode networks. While consistent with altered reward–control balance, the cross-sectional design and eligibility restrictions limit causal and population-level conclusions. Recent synthesis work has increasingly reframed FA as "ultra-processed food (UPF) addiction," emphasising that addictive-like symptoms cluster around UPFs and may include withdrawal-like experiences during attempts to reduce intake, with implications for dietary adherence and relapse (LaFata et al., 2024). Consistent with this framing, Palacio et al. (2024) reported FA (YFAS 2.0) in 12.7% of patients undergoing weight-loss treatment in Chile (N = 158), with withdrawal identified as the most prevalent criterion and FA associated with anthropometric/body-composition measures. In bariatric surgery contexts, Walø-Syversen et al. (2024) observed reductions in FA prevalence one-year post-surgery (with pre-surgery prevalence reported at 16% in their cohort), while also highlighting the relevance of depressive symptoms and disordered eating patterns when interpreting post-operative trajectories. Longer-term outcome data similarly suggest prognostic relevance: Guerrero-Pérez et al. (2025) reported that preoperative FA (17.6%) was associated with lower total weight loss at three years, largely attributable to greater weight regain. Complementing these cohort findings, a recent systematic review/meta-analysis evaluating FA as a prognostic factor for weight loss concluded that the evidence base remains heterogeneous and underscored the need for prospective, standardised studies (Halbeisen et al., 2025).

Discussion

Strengths

Across the reviewed corpus, a major strength is the progressive shift from treating food addiction (FA) as a single score to examining it as a *networked, multi-domain phenotype* that intersects with binge-eating pathology, affective symptoms, and self-regulatory processes. In particular, Carbone et al. (2023) strengthened interpretability by analysing FA alongside binge-eating disorder (BED), depression, and related eating-disorder psychopathology using multiple validated instruments, thereby reducing the risk of attributing clinically meaningful variance to FA that is, in practice, driven by comorbidity. This is a valuable contribution because current evidence increasingly supports FA (and its recent reframing as "ultra-processed food [UPF] addiction") as a pattern of compulsive consumption with shared features across eating-disorder spectra rather than a BMI-defined category (LaFata et al., 2024).

A second strength is the use of *high-resolution self-regulation measurement* in several studies. Designs that disaggregate impulsivity into multiple facets (rather than relying on a single omnibus impulsivity indicator) improve construct validity and clinical actionability by identifying which components of self-regulation are most consistently implicated (e.g., emotion-driven urgency vs inhibitory control). This is especially important because recent synthesis indicates that FA may be more strongly linked to relapse and adherence challenges than to BMI cross-sectionally, which implies that the self-regulation phenotype is central to clinical risk stratification (Halbeisen et al., 2025).

Third, the inclusion of *neurobiological approaches* (EEG indices such as asymmetry and event-related potentials, and resting-state fMRI connectivity) adds mechanistic plausibility and triangulates beyond self-report. Findings such as altered reward-network connectivity, differential engagement of salience and executive networks, and markers consistent with cue-reactivity and control imbalance are conceptually coherent with contemporary UPF-addiction models, which emphasise reinforcing properties of UPFs, cue-driven craving, and impaired regulation (LaFata et al., 2024 Importantly, these modalities also support a clinically relevant conclusion: FA may exist as a *behavioural-addictive phenotype* regardless of obesity status, thereby explaining why some cohorts demonstrate weak FA–BMI associations yet still show clinically significant distress and dysregulated eating.

Fourth, the use of structured clinical interviewing in at least one study (alongside YFAS self-report) improves diagnostic confidence by reducing misclassification and offering DSM-5–informed context for addictive-like eating patterns. Likewise, designs that compare FA features across consecutive BMI groups provide a more nuanced understanding of how FA symptomatology distributes across weight strata, which strengthens construct validation and discourages simplistic assumptions that FA is merely "obesity by another name."

Finally, theoretical innovation is evident in studies that apply alternative addiction models (e.g., a three-criteria addiction-like framework) to interrogate relapse propensity and compulsive seeking. This contributes to the emerging consensus that relapse dynamics may be one of the most clinically meaningful aspects of FA—particularly in weight management and post-intervention maintenance—rather than cross-sectional BMI differences alone (Horton et al., 2023; Halbeisen et al., 2025)

Limitations

Despite these strengths, several recurrent limitations constrain the strength of inference. First, sampling issues persist: modest sample sizes relative to the number of variables tested, geographically bounded recruitment, and limited racial/ethnic diversity reduce statistical power, inflate uncertainty around effect sizes, and limit generalisability (Aviram-Friedman et al., 2020; Sukesh et al., 2024; Ravichandran et al., 2021; Schankweiler et al., 2023). In clinical severe-obesity cohorts, restricted BMI variance can further obscure FA–BMI associations even when FA is clinically salient, increasing the likelihood of null findings driven by range restriction rather than absence of association.

Second, measurement heterogeneity remains important. Some studies used older YFAS versions due to recruitment timing, while others relied on translated adaptations without fully documented psychometric properties. When convergent/divergent validity, test–retest reliability, and measurement invariance are not reported, both prevalence estimates and associations with obesity indicators should be interpreted cautiously. This is particularly relevant for cross-cultural research where linguistic nuance can alter endorsement thresholds for craving, withdrawal-like experiences, or impairment criteria.

Third, the dominance of cross-sectional designs limits causal inference across the entire evidence base. Temporal ordering is unresolved: FA may contribute to weight gain via sustained UPF-driven craving and loss of control; obesity-related physiology may increase vulnerability to addiction-like eating; or both may be driven by shared determinants such as depression, sleep disturbance, socioeconomic stress, and high-UPF environments. These

limitations matter more now because the broader obesity literature increasingly implicates UPF exposure as a driver of weight gain and obesity risk, implying that models omitting UPF intake and food-environment measures may suffer from omitted-variable bias (Dicken & Batterham, 2024).

Fourth, reliance on self-report introduces recall and social desirability bias, potentially affecting the accuracy of symptom reporting and comorbidity assessment. This is particularly salient when interpreting network analyses that include multiple self-report measures, where correlated error can inflate apparent associations among constructs.

Fifth, several studies noted limited dietary characterisation and minimal food-environment assessment (e.g., availability, marketing exposure, school/home food context). This is a growing gap given strong recent evidence linking UPF consumption to obesity and the explicit call for environmental change to facilitate UPF reduction (Dicken & Batterham, 2024).

Finally, translational limits apply to animal studies. Rodent paradigms are valuable for isolating relapse-like responding and separating obesity susceptibility from addiction-like behaviours, yet they cannot capture human cultural eating practices, food marketing, socioeconomic gradients, and complex emotional drivers of consumption, which are central to real-world FA.

Compare and Contrast

When integrated, the findings indicate that FA is frequently but not uniformly associated with higher BMI and obesity indicators. Positive FA–BMI/adiposity correlations are reported in multiple observational studies (e.g., Sönmez Güngör et al., 2021; Pape et al., 2021; Sukesh et al., 2024; Minhas et al., 2021). However, null or weak FA–BMI relationships also occur, particularly in specialised severe-obesity clinical contexts or experimental animal work (Schankweiler et al., 2023; Horton et al., 2023). Rather than treating this inconsistency as contradictory evidence, a more parsimonious interpretation is that BMI is not the most proximal marker of FA. FA appears more tightly coupled to *behavioural dyscontrol (loss-of-control eating, binge/grazing patterns)* and *negative affect (depressive and anxiety symptoms)* than to weight status per se. This interpretation aligns with emerging synthesis showing that FA's prognostic relevance may become more visible in adherence, dropout, and relapse trajectories rather than in cross-sectional BMI (Halbeisen et al., 2025).

The reviewed literature also consistently shows that psychological distress and maladaptive eating behaviours are among the strongest correlates of FA symptom severity (Brytek-Matera et al., 2021; Pape et al., 2021; Ravichandran et al., 2021). Sex-related differences reported in neuroimaging findings may plausibly reflect differential emotional reactivity and cognitive control; however, these patterns require careful interpretation because physical activity, sleep, and sociocultural factors may confound observed sex effects. The strongest inference supported by the current evidence is that FA is embedded within a distress–dysregulated eating phenotype that can occur across weight categories but is more prevalent in obesity-enriched samples.

Recent work further refines this synthesis by reframing FA as UPF addiction, emphasising that addictive-like symptoms cluster around UPFs and may include withdrawal-like experiences during reduction attempts, with relevance for weight management and health disparities (LaFata et al., 2024). At the outcome level, longer-term data indicate that preoperative FA may relate to poorer weight trajectories through greater weight regain after bariatric surgery,

underscoring the importance of maintenance-phase behavioural support (Guerrero-Pérez et al., 2025).

Application and Implications

Obesity is associated with many health complications, and with its increasing prevalence, there is a need to understand the factors that contribute to the cause of obesity, in this case, maladaptive eating behaviors such as FA. Recent research suggests that FA is one of the main reasons for overeating which can lead to obesity. Hence, clinical, education and public policies need to be in play to curb the rising obesity rates. Practical applications and implications of the recent research surrounding FA will be explored. The applications below are meant to serve as strategies in order to address FA to combat obesity and promote a healthier lifestyle.

Clinical Application

Screening and formulation (beyond BMI). The evidence supports integrating FA screening into obesity medicine and eating-disorder pathways, not as a label but as a formulation tool. A clinically useful minimum assessment battery would combine: (i) YFAS 2.0 (or equivalent), (ii) a brief BED/loss-of-control eating screen, (iii) depression/anxiety screening, and (iv) dietary exposure mapping focused on UPF intake, triggers, and high-risk contexts (evenings, stress, post-restriction rebound). This approach is consistent with evidence that FA clusters with BED and depressive symptoms and with recent UPF addiction framing (Carbone et al., 2023; LaFata et al., 2024).

Multimodal intervention: biopsychosocial and relapse-preventive. Findings across studies support a multimodal approach that targets both behaviour and context. Core elements should include: (a) dietetic work on UPF reduction and food-environment restructuring (shopping routines, planned meals/snacks, reduced cue exposure at home), (b) psychological intervention targeting craving, emotion regulation, and loss-of-control eating (CBT-based relapse prevention, stimulus control, coping plans for triggers), and (c) social/behavioural supports including structured physical activity, which may buffer FA symptoms and improve mood regulation (Brytek-Matera et al., 2021; Schankweiler et al., 2023). This aligns with a wider evidence base that UPF exposure contributes to obesity risk and that environmental change supports sustained dietary shifts (Dicken & Batterham, 2024).

Targeting maintenance and weight regain risk. Recent evidence suggests FA's most clinically consequential role may emerge in longer-term outcomes and relapse/weight regain dynamics. A systematic review and meta-analysis found heterogeneous results but highlighted moderation by intervention type and sample characteristics (Halbeisen et al., 2025). In bariatric surgery populations, preoperative FA has been associated with lower total weight loss over three years, largely via greater weight regain, supporting routine post-operative monitoring of FA symptoms and early booster interventions when relapse risk rises (Guerrero-Pérez et al., 2025).

Precision approaches. Where resources permit, neurobiological findings suggest potential value in stratifying patients by cue-reactivity and control vulnerability. While not yet ready for routine clinical adoption, these findings help justify targeted behavioural prescriptions (e.g., stronger emphasis on cue-exposure management and inhibitory control training for high cue-

reactivity phenotypes) and reinforce the rationale for treating FA as a mechanism-informed behavioural phenotype rather than a BMI-defined label.

Educational Application

Curriculum and skills development. Education systems can translate this evidence by integrating a biopsychosocial model of eating into health curricula: reward learning, UPF cues and marketing, stress and sleep, emotion regulation, and self-regulation skills. Such curriculum design is supported by evidence that school-based healthy eating interventions can improve diet-related outcomes in adolescents, although effects vary by intervention intensity and implementation quality (Samad et al., 2024).

Supportive food environments at school. Given that UPF availability and marketing shape dietary behaviours, schools can enhance impact by pairing education with environmental change: procurement standards that reduce UPFs in canteens, limits on competitive foods, and restrictions on marketing exposure on school premises and surrounding zones. A recent global scoping review of nationally mandated school food-environment policies found substantial gaps in both coverage and enforcement, indicating a strong policy opportunity for scalable prevention (Perry et al., 2024).

Whole-school and caregiver engagement. School interventions are likely to be more effective when coupled with caregiver-facing components (shopping skills, home food-environment changes, and media literacy on marketing). Broader evidence linking obesogenic food environments to obesity risk supports multilevel strategies that address availability, accessibility, affordability, and appeal—not solely individual choice (Pineda et al., 2024; Liu et al., 2025)

Policy Implications

Malaysia's major nutrition-related frameworks, including the *National Plan of Action for Nutrition of Malaysia III* (NPANM III), the *Malaysian Dietary Guidelines* (MDG), and the *National Strategic Plan for Non-Communicable Diseases 2016–2025* (NSP-NCD), provide science-based recommendations on healthy eating, balanced diets, and community nutrition education (Ministry of Health Malaysia, 2016; Ministry of Health Malaysia, 2020). Nevertheless, these policies tend to prioritise dietary composition and behavioural advice without sufficiently addressing psychosocial drivers of eating, such as stress-related eating, emotional dysregulation, and addictive-like consumption patterns. Moreover, these frameworks provide limited attention to regulating the marketing and availability of highly palatable, energy-dense foods that may reinforce compulsive intake. Therefore, future policy revisions should strengthen public education and health-promotion campaigns to raise awareness about the addictive-like properties of certain foods and to promote skills such as emotional regulation and cognitive restraint. In parallel, stricter regulatory measures should be considered for the marketing of high-fat, high-sugar foods, particularly where children and other vulnerable groups are concerned, including individuals experiencing high stress or mental health difficulties.

Similarly, the *National Strategic Plan for Mental Health 2020–2025* outlines mental health service provision, particularly for individuals experiencing severe mental illness (Ministry of Health Malaysia, 2020), yet it does not explicitly recognise FA as a relevant mental health

concern. Given the evidence linking FA with psychological distress and maladaptive eating, incorporating FA into mental health policy would enable more systematic screening, referral pathways, and treatment resources. Establishing or strengthening specialised services within government hospitals—such as multidisciplinary clinics that address addictive eating alongside obesity and eating-disorder features—could improve identification and management at population level.

Finally, evidence indicates that physical activity may be protective against FA and related maladaptive eating patterns (Brytek-Matera et al., 2021). Encouragingly, Malaysia has implemented initiatives to increase physical activity, such as the Ministry of Youth and Sports' *Fit Malaysia X* campaign (Ministry of Youth and Sports, 2020), which supports national efforts to curb rising obesity rates. Building stronger links between such activity-based initiatives and psychosocial eating interventions could further enhance prevention and health promotion outcomes.

Future Directions

Clarify and standardise the construct (FA vs UPF addiction). Future reviews and primary studies should explicitly define whether they are assessing *food addiction* broadly or *ultra-processed food (UPF) addiction* specifically, and should standardise what counts as the "addictive exposure" (e.g., UPF proportion/grams/day, NOVA classification, or UPF "cue load"). This will improve comparability and aligns with recent syntheses that frame the field around UPF addiction and its implications for weight management and disparities (LaFata et al., 2024).

Advance measurement science for YFAS 2.0 internationally. Cross-cultural validation studies should routinely report reliability, test–retest stability, convergent/divergent validity, and measurement invariance across sex, age, and ethnicity, and should publish scoring/translation procedures transparently. This is especially important as YFAS 2.0 use expands across clinical and bariatric contexts and new language versions are being developed (Martini-Blanquel et al., 2025).

Move beyond cross-sectional evidence to causal designs. The field needs prospective cohorts with repeated measurement of UPF exposure, FA symptoms, mood, sleep, physical activity, and cardiometabolic markers to model temporal ordering and bidirectionality (e.g., FA → weight gain vs obesity-related physiology → FA). Where feasible, quasi-experimental designs (policy or food-environment changes) should be used to strengthen causal inference.

Test mechanism-targeted interventions, not just "weight loss". Randomised trials should compare: (i) standard behavioural weight management, (ii) structured UPF reduction + food-environment restructuring (availability/cue control), and (iii) relapse-prevention protocols focused on craving, lapses, and high-risk contexts. This is justified because prognostic evidence for FA in weight-loss outcomes is heterogeneous, suggesting that intervention type and sample characteristics matter (Halbeisen et al., 2025).

Use experimental diets to isolate the role of processing. Controlled feeding and crossover trials that hold macronutrients constant but vary processing level can identify whether "processing" itself changes energy intake, craving, and self-control. Contemporary clinical

research and commentary on UPF versus minimally processed diets provides a strong platform for this next step (Dicken & Batterham, 2025).

Integrate multi-level mechanisms. Future mechanistic work should combine (a) cue-reactivity and inhibitory-control tasks, (b) neuroimaging/EEG markers, and (c) metabolic and gut–brain indices (e.g., appetite hormones, insulin dynamics, microbiome-related metabolites) to explain *why* craving and relapse persist. Multi-site harmonisation (shared protocols, preregistration, common UPF exposure metrics) would markedly improve replicability.

Prioritise equity and subgroup effects. Studies should be adequately powered to test effect modification by sex, developmental stage (adolescence vs adulthood), socioeconomic position, and cultural dietary norms—especially in under-represented settings where UPF availability is rising. This is consistent with recent work emphasising disparities in UPF addiction and the need for context-sensitive prevention (LaFata et al., 2024).

Evaluate policy levers with behavioural endpoints. Policy and systems research should assess school food standards, marketing restrictions, fiscal measures, and front-of-pack labelling using quasi-experimental methods, and should measure outcomes beyond BMI (e.g., craving frequency, relapse episodes, UPF purchasing, and diet quality). The growing evidence base on UPFs and obesity risk supports expanding evaluation metrics to capture the addictive-like phenotype and its drivers (Dicken & Batterham, 2025; LaFata et al., 2024).

Islamic Perspective
To begin with, Islam views the body as a trust (*amānah*) from Allah that must be safeguarded and cared for, as it is among the most precious blessings. Since the body ultimately belongs to Allah, Muslims are encouraged to maintain their health (Hibban, 2022). Fulfilling religious duties and obligations requires good health, and neglecting one's health may be regarded as a breach of this trust.

A core principle in Islamic teachings is moderation (*al-mīzān*) and balance, which underscores the importance of living a harmonious and wholesome life. This principle regulates conduct, including dietary habits, in the interest of health. Physical, mental, and spiritual wellbeing is sustained through moderation, ensuring that one neither under-consumes nor overindulges. Mohd et al. (2023) noted that excessive consumption of food, drink, and other aspects of life can disrupt this balance.

Moreover, Islam cautions against addiction, whether to behaviours or substances. Resisting temptations and avoiding harmful practices requires self-control, which Islam emphasises as an essential virtue. Addictions, including FA, may be viewed as unhealthy attachments that can harm one's wellbeing. The use of substances that impair the soundness of the mind is prohibited even if they are not intoxicating (Usman et al., 2022). Accordingly, addiction to anything, including food, conflicts with Islamic teachings on self-restraint and moderation. Muslims are urged to curb their desires and avoid behaviours that lead to harm. FA also runs counter to the Islamic emphasis on self-discipline, as it can be regarded as a form of excess. Overconsumption may weaken one's spiritual relationship with Allah, contribute to obesity, and damage the body. Such behaviour contradicts the ideals of moderation and balance, which aim to protect the individual from the harms of excess.

In addition, Islam offers clear guidance on dietary conduct, highlighting the importance of healthy eating. Budiyanto and Bahri (2022) reported that the Prophet Muhammad (PBUH) advised against overeating and encouraged moderation, as reflected in the well-known hadith: "one-third for food, one-third for drink, and one-third for breath" (al-Tirmidhī). This hadith promotes a balanced approach to consumption. Islamic teachings also emphasise consuming lawful (*halal*) and wholesome (*ṭayyib*) foods and avoiding substances that are harmful to health.

Excessive or harmful consumption—particularly patterns that contribute to addiction—is discouraged, whereas the intake of lawful and nutritious food is encouraged. Allah says in the Qur'an: "Eat from the good, lawful things provided to you by Allah. And be mindful of Allah in whom you believe" (Qur'an 5:88). Adhering to this guidance helps Muslims protect their bodies and maintain the balance required for optimal health.

From a neurobehavioural perspective, addiction can arise due to overstimulation of the mesolimbic and mesocortical pathways (Feltenstein & See, 2013). Overactivation of these circuits can impair consequence evaluation and weaken resistance to cravings, promoting poor decision-making and a focus on immediate reward. FA is also associated with stress. In this regard, patience (*sabr*) is essential for strengthening delayed gratification and reducing vulnerability to addictive eating. Islam strongly emphasises *sabr* in worldly life, with the promise of greater reward in the Hereafter. The prefrontal cortex is crucial in guiding behaviour and self-regulation, reflecting a distinctive aspect of human moral agency (Szczepanski & Knight, 2014).

One practical avenue is consistent engagement with daily prayer. Prayer may help cultivate delayed gratification by supporting prefrontal engagement (Newberg et al., 2015). It can also foster mindfulness by increasing awareness of one's thoughts, emotions, and actions, and by training the habit of beginning activities with intention. Evidence suggests that mindfulness practice during craving states can help reduce addictive behaviours (Enkema & Bowen, 2017). Stress is a recognised contributor to addictive behaviours (McMullin et al., 2020). Prayer has been associated with activation of the parasympathetic nervous system, which may reduce stress (Doufesh et al., 2014), potentially mitigating binge and emotional eating.

Likewise, fasting (*ṣawm*) may play a supportive role in reducing addictive eating patterns. Fasting may influence dopaminergic functioning in ways that could reduce intense cravings and over-reliance on food for pleasure (Wallace et al., 2021). It may also support neuroplasticity, enabling the brain to adapt towards improved self-control and decision-making, particularly within prefrontal systems (Van Praag et al., 2014). Behaviourally, fasting can facilitate the replacement of maladaptive habits with healthier alternatives (e.g., exercise, reading, or other stress-reducing activities), potentially reshaping reward-seeking patterns. Fasting has also been shown to improve insulin sensitivity, which may stabilise blood glucose fluctuations and reduce craving vulnerability linked to stress-related dysregulation (Sutton et al., 2018).

Nevertheless, while daily prayer and fasting may contribute to reducing addictive tendencies, additional evidence-based interventions such as cognitive behavioural therapy (CBT) and mindfulness-based cognitive therapy (MBCT) should also be considered. For some individuals, prayer and fasting alone may be insufficient as preventive or therapeutic measures. Cognitive

processes—how one interprets cravings, manages stress, and responds to triggers—also require focused attention within comprehensive intervention planning.

Conclusion

In conclusion, the evidence reviewed indicates that food addiction (FA) is frequently associated with obesity and obesity-related indicators, although the strength of this relationship varies across populations and settings. From an Islamic perspective, the body is regarded as an *amānah* (trust) from Allah; therefore, safeguarding health is not merely a personal preference but a religious responsibility that enables the fulfilment of obligations commanded by Allah. Islamic teachings also emphasise moderation (*al-mīzān*) in all matters, including food consumption, and promote self-control through practices such as prayer and fasting, which can support restraint and healthier behavioural regulation.

Methodologically, the reviewed studies employed a range of approaches, including clinical interviews, validated questionnaires, and, in some cases, neurobiological measures, which strengthens the overall credibility of the evidence base. Nevertheless, important limitations remain, particularly the predominance of cross-sectional designs and sampling constraints that restrict generalisability. Future research should therefore prioritise longitudinal and culturally diverse studies to clarify directionality, examine relapse and maintenance over time, and improve the cross-cultural validity of FA measurement tools.

By synthesising current findings, it can inform the development of more effective interventions for FA, support health education efforts that address psychosocial drivers of eating, and guide policy refinement—particularly in integrating behavioural and mental health considerations into nutrition and obesity prevention strategies.

Acknowlededgment

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