Food Addiction

Yeme Bağımlılığı

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ABSTRACT
Although the use of the term "addiction" dates back to 1890, literature studies on the subject are relatively new. In food addiction (FA), the individual develops a behavioral pattern similar to addiction for processed, greasy, sugary, and salty foods. Neurobiological studies on FA show considerable similarities with substance addiction. FA, which has been shown to accompany eating disorders and psychiatric disorders, should be included in treatment guides in order to facilitate diagnosis and treatment. The aim of this article is to raise conceptual awareness regarding diagnosis and treatment strategies for FA..
Keywords: Food addiction, eating disorders, psychiatric disorders.

ÖZET
Bağımlılık teriminin gıda ile birlikte kullanımı 1890 yılına kadar uzansa da üzerinde yapılan literatür çalışmaları oldukça yenidir. Yeme bağımlılığında (YB), işlenmiş aşırı yağlı, şekerli ve tuzlu gıdalara karşı bağımlılık benzeri davranış paterni oluşmaktadır. YB'na ilişkin yapılan nörobiyolojik temelli çalışmalar madde bağımlılığına ilişkin ciddi benzerlikler içermektedir. Yeme bozuklukları ve psikiyatrik bozukluğa eşlik ettiği gösterilen YB'nın tanı ve tedaviyi kolaylaştırma açısından tedavi klavuzlarında yer alması gerekmektedir. Yazımızda, kavramsal açıdan tedavi stratejilerine, YB tanısına farkındalık oluşturmak amaçlanmıştır.
Anahtar kelimeler: Yeme bağımlılığı, yeme bozukluğu, psikiyatrik bozukluklar

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FOOD ADDICTION FROM A CONCEPTUAL STANDPOINT;

The term "food addiction (FA)" was used by Theron Randolph for the first time. Randolph associated this concept with alcohol addiction. The term is usually used to describe the process where high-calorie and processed foods form an addiction picture (1).

The classification of DSM, one of the diagnosis manuals used in psychiatry, is generally based on common symptomatology. However, the fact that it does not assess clinical conditions comprehensively (biological parameters, course of disease, response to treatment, familial loading) leads to criticisms regarding DSM's categorization (2). A similar picture applies to food addiction as well.

In terms of addictiveness which without substance intake in DSM 5 (3); only pathological gambling use was assessed under the title of dependency.Although pica, anorexia nervosa, bulimia nervosa, and binge eating disorder, which contain abnormal eating behavior patterns, are included in DSM 5, it does not consider food addiction in this context.

There are different hypothetic explanations for the term "food addiction", which is not included in the diagnostic category. One of the hypothetical approaches is that the product considered as food creates an addiction picture due to some of its biochemical properties, and similar to other presentations of addiction included in DSM 5, this presentation of addiction is characterized by disruption in the behavioral process and functionality. In conclusion, products used as food carry an addiction potential and/or affected individuals are predisposed to develop addiction to foods (4).

The other hypothetical approach considers the behavioral presentation rather than the neurochemical pattern of the substrate. The definition of addiction is important in this sense. Although the concept of addiction is believed to be synonymous with substance abuse (5), it is derived from the Latin root "addicere" and has become a widely used term for continuous extreme behavior (6). In line with its historical definition and considering the behavioral presentation, the term "addiction" today has become a term used to explain not only substance abuse, but also processes relate to eating, internet use, and gambling.

Hypothetical pictures usually support the addiction pattern. However, the fact that the process is linked with impulsivity and emotional intolerance has led to different descriptions. Uncontrolled eating (UE) is one of these descriptions (7).

Unlike other types of addiction, the fact that the eating function contributes to the vital process directly causes controversy regarding FA as well (8). In conclusion, it is undeniable that the eating function, which is a part of survival, may lead to an addiction picture, which may be a vital threat. For this reason, FA is a disorder which must certainly be included in categorization-classification systems in terms of diagnosis and intervention.

SCALES USED FOR DIAGNOSIS

The Yale Food Addiction Scale (YFAS) is used to assess food addiction (9). YFAS is a 25-item scale filled by the client. YFAS adapts substance addiction criteria to eating behavior. The Turkish validity and reliability study of the scale was conducted by Bayraktar et al. in 2011 (10). Two additional items in the scale are related to clinical impairment and emotional results arising from eating. Two out of eleven diagnostic criteria must be accompanied by items related to clinical impairment and negative emotional consequences arising from eating for the diagnosis. There is also a version of YFAS adapted to be appropriate for children.

FOOD ADDICTION FROM A BIOLOGICAL STANDPOINT

Although the use of the term "addiction" dates back to 1890, literature studies on the subject are relatively new (11). Studies on the subject may be divided into those focusing on the substrate and those focusing on the neurobiological mechanism. The source of food addiction is believed to be sugary, fatty, and salty processed foods. Studies with salty foods have shown a hedonic presentation similar to the effect of opioid agonist (12).

Some animal studies support the idea of food addiction caused by diets containing high-sugar, high-fat foods (13). The sugar use alone is reported to cause behaviors similar to addiction in experimental animals (14). There are also studies suggesting that glycemic load and glycemic index might be assessed in terms of addiction potential (15).

In studies advocating that behavioral changes are not associated with neurochemical effects of sugar, it is believed that animals rarely display additional behaviors towards sugar and such behaviors are observed only when the access to sugar loses continuity (16). In conclusion, there is no clear pharmacodynamic explanation for the relationship between blood glucose level and addiction (16).

FOOD ADDICTION FROM A NEUROLOGICAL STANDPOINT

The eating disorder (ED) model is essentially based on animal studies model (17). In addition to studies specific to the FD process, it is also possible to assess FD based on substance addiction studies. Models that are valid for food addiction usually focus on reward dependance and memory processes.

Drug use increases dopamine secretion from mesolimbic centers.Similarly, cues related to delicious food and eating increase the dopamine level in striatum in case of food addiction (18). Reuse behavior is enhanced due to the dopaminergic effect from the mesolimbic center (19). Also, substance use causes dopaminergic activation in nucleus accumbens. These two changes (dopamine secretion from the mesolimbic region and increased activation in nucleus accumbens) that occur during the act of eating are believed to be indicators of the individual's addiction potential (20).

An investigation performed for the onset of cocaine addiction has shown a decrease in D2 receptors (21). It is believed that low dopaminergic system activity increases susceptibility to drug use and chronic drug use decreases the number of D2 receptors, thus causing a "hypodopaminergic" system (22). The expected picture stipulates that food addiction is formed similarly through dopaminergic pathways (16). In addition to addictive property of the substrate and neurobiological factors, there are also articles which suggest that the picture is formed by behavioral addiction (23).

FOOD ADDICTION'S RELATIONSHIP WITH PSYCHIATRIC DISORDERS

In terms of psychiatric co-morbidity of food addiction, it would be appropriate to address eating disorders first. For the first time, Gearhardt et al. found that individuals with binge eating disorder (BED) showed a high rate of FA (24). Additionally, a high FFAS score was shown to be a significant predictor of binge eating disorder, being overweight at an early age, and early diet onset (25). Another eating disorder which meets the food addiction criteria to a large extent is bulimia nervosa. There are studies which show that all clinically active bulimia patients meet food addiction criteria (26).

In another study conducted to determine subtypes of eating disorder, it was found that the prevalence of food addiction was higher in eating disorder types presenting symptoms of binge eating and the lowest parameter was obtained for limited-type anorexia nevrosa. The

prevalence of food addiction was found to be 85.7% in the anorexia nevrosa binge purging subtype, 81.5% in bulimia nevrosa, and 76.9% in binge eating disorder (27). It was also found in this study on subtypes that YFAS score was associated with more severe eating pathology and overall psychopathology (namely negative affect and depression), and a greater body mass index.

Another psychiatric disorder which accompanies food addiction is PTSD. Consuming pleasure-inducing foods and beverages becomes a cheap, legal, and easy-to-get method to avoid negative emotions and memories for the traumatized person (28). There are also studies which show that PTSD is accompanied by bulimic behaviors and obesity (29). Considering that bulimia nevrosa is accompanied by food addiction at such a high rate, the significance of these studies for food addiction is evident. In a study conducted by Mason et al., 80% of the cases with a history of physical and/or sexual abuse in childhood were found to meet food addiction criteria (30). The combination of food addiction and binge eating behavior in particular was found to be associated with impairment in general psychopathology and increased anxiety and depression level (31).

Attention-deficit hyperactivity disorder (ADHD) is a neurodevelopmental disorder which may be accompanied by lack of attention, hyperactivity, impulsivity, and dysfunctional presentation in frontostriatal region (32). There are articles supporting the relationship between obesity and ADHD. A genetic correlation was found especially between smoking, high body mass index, and ADHD (33). Although there are evidences suggesting no relationship, impulsivity, low attention performance, and neuroimaging results are factors facilitating food addiction co-morbidity.

Emotional dysregulation is involved in the formation and continuation of addiction. Emotional regulation includes processes by which one experiences one's emotions, reflects on them, and is affected by them (34). The lack of skills related to controlling emotions and emotional distress leads to 'emotional dysregulation' (35). There are studies in the literature which attempted to control emotional dysregulation through eating behavior (36).

It was found that negative mood and chronic stress increased appetite, craving, selective attention towards food, and preference for higher-calorie foods (37). In one study, it was found that pictures of high calorie foods elicited exaggerated activity in regions of the brain involving reward and motivation and significant deactivation in frontal regions in individuals exposed to high chronic stress (38).

BEHAVIORAL COMPONENTS OF FOOD ADDICTION

Behavioral components of food addiction may be described as impulsive and compulsive behaviors. Similar to substance addiction, impulsivity plays an important role in food addiction as well (39). Impulsive behavior can be defined as involuntary acts performed in response to internal and/or external stimuli without considering consequences (40).

Impulsivity is believed to consist of four layers:

1- A state of urgency (as in the process of avoiding negative emoitions),

2- Lack of premeditation, failure to think potential consequences,

3- Lack of focusing, which accompanies the failure to resist the action,

4- Sensation seeking (41).

Some researchers suggest that there are two facets to urgency, negative urgency and positive urgency. Negative urgency refers to the tendency to behave impulsively under stress. Positive urgency, on the other hand, is the tendency to behave impulsively when in an positive emotional state (42).

There are studies showing that patients with disinhibited eating behavior display negative urgency and sensation seeking. In one study, overweight individuals who met binge eating disorder and food addiction criteria were shown to display higher impulsivity compared to those who did not meet the criteria (43).

Compulsivity and impulsivity are similar psychiatric presentations arising from the same neural substrates. While it is usually impulsivity which starts the addiction picture, it is compulsive behavior which maintains it. Compared to obesity patients without binge eating disorder, those with binge eating disorder present compulsive impairments (44). Also, it was shown that the same neural mechanisms and compulsive behaviors were involved in substance abuse and food overconsumption (45).

TREATMENT

The treatment strategy may be examined based on four core elements of food addiction:

1- Craving - through opioid system,

2- Impulsivity - as a personality trait,

3- Compulsive consumption - via serotonergic system,

4- Motivation - via dopaminergic system (46).

Opioid system is the center of the hedonic reward system. In the hedonic reward pathway, opioid system is accompanied by dopaminergic system (18). Pharmacological intervention for craving symptoms in addicted patients occurs through the opioid system (47). Studies address food addiction through eating disorders (such as binge eating) which frequently accompany food addiction.

It was found that intranasal naloxone spray, an opioid antagonist, decreased time spent binge eating significantly more compared to placebo nasal spray in patients with BED (48). In one study including obese women with naltrexone, opioid and alcohol use, opioidergic blockage was found to reduce an association between trait-like reward-driven eating and daily food-craving intensity (49). The use of motivational interview and CBT (Cognitive Behavioral Therapy) was shown to be beneficial in terms of eliminating lack of motivation, emotional regulation, and coping skills. These therapeutic methods may be used alone or together with pharmacotherapy (50).

Impulsivity was found to be associated with results of addiction treatment and relapse (51). Psychiatric interventions (such as CBT and group therapy) on impulsivity in substance addiction cases aim to ensure acceptance and enduring negative emotions by raising the awareness level. Especially mindfulness helps prevent automatic and impulsive behavior by increasing the awareness for the current time and environment (52). Also, methods related to cues and rewards are used in impulsivity treatment. For this reason, patients are advised to avoid things (cues) that remind them of the substance (53).

The only drug that can be used for food addiction from a pharmacologcial and impulsivity-related standpoint is lisdexamfetamine dimesylate, which has been proven to be effective in BED treatment. Lisdexamfetamine dimesylate is the only FDA approved drug used for binge eating syndrome (54).

The treatment of compulsive eating may be based on the treatment of obsessive compulsive disorder (OCD), which contains similar compulsive behavior. In OCD, compulsive behavior occurs via the serotonergic system. Serotonergic receptor blockers are an essential part of the pharmacological treatment of OCD. Second-generation antidepressants were shown to be effective on binge eating episodes and obsessions/compulsions related to binge eating (55). This effect of SSRIs has potential due to its positive effect on depressive symptomatology which accompanies binge eating disorder frequently.

Although the data is limited, N-acetylcysteine, a prodrug effective on glutamine and dopamine neurotransmission in addition to the serotonergic system, was shown to have positive effects on compulsive behavior (56).

Psychotherapeutic methods with or without drugs are believed to have the potential to be useful for treating the compulsive presentation. Gaining stimulus control and effective coping skills are especially important. Patients may be guided to avoid tasty food and find alternatives to overeating for pleasure and reward (57).

Latest publications show that obesity is related to decreased striatal dopamine receptors and striatal dysfunction (58). A decrease was detected in dopaminergic receptors in the striatal region compared to the pre-addiction period for individuals with addiction potential. This causes predisposed individuals to perceive the reward to be more distinctive and attractive.

Motivation interview techniques and cognitive behavioral therapy methods were developed to prevent relapse and improve motivation. Also, interpersonal therapy and cognitive therapy were shown to be effective on long- and short-term binge eating attacks. This effect allows for prevention of weight-gain due to binge eating attacks rather than ensuring weight losing (50).

CONCLUSION

The eating behavior assumed to be physiological may turn into FA which focuses on foods with high fat, salt, and sugar content and displays addictive behavioral pattern. The frequency of co-morbidity with other psychiatric diseases and disorders increases the importance of diagnosis and intervention. Although FA does not have a clear conceptual definition, it is a disorder which can be assessed using scales. Raising awareness regarding the picture which displays addiction characteristics and ensuring assessment materials (such as YFAS) are used will facilitate clinical intervention.

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