

Behavioral Addiction Under The Rubric Of Addiction Spectrum Disorders Ranging From Impulsive-Compulsive Disorders To Reward Deficiency Syndrome



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Introduction

The term addiction comes from the Latin word “addicere”, which translates as “bound to”, or “enslaved by”. Behavioral addictions also known as “process addictions” or “impulsive-compulsive behaviors” encompass a diverse group of behaviors right from compulsive shopping, gambling, internet use and gaming to pornography, sex, exercising and food addiction. Humans have been known to have non-substance addictive behaviors since time immemorial and evidence to this can be found in ancient literature across continents. However the diagnostic rubric for behavior addiction is a recent epoch with the addition of gambling disorder in the chapter substance-related and addictive disorders in DSM-5.

Behavioral addictions share many features similar to substance addictions in the form of spending more and more time due to intense craving to repeatedly indulge in the behavior despite possible harm and symptoms like irritability and dysphoric mood when abstinent. Hence shows the phenomena of tolerance, craving and withdrawal symptoms. They also share many features similar to obsessive compulsive disorders in the form of obsessive thoughts about the behavior, a sense of tension and excitement before performing the behavior and compulsive engagement in the activity without having any control over its amount and time along with a sense of pleasure, gratification and relief when performing or shortly after it has been performed. There is also a significant association between addictions and impulsivity as evidenced by the comorbidity of impulse dyscontrol and attention deficit hyperactivity disorder with addictions. Further there is much evidence for the defects in impulsive choice and impulsive action in addictive disorders, especially behavior addictions. Further these behavioral addictions with impulsive spectrum and obsessive compulsive spectrum defects have been included under a superordinate category of impulsive-compulsive disorder.

The reward deficiency syndrome has long been implicated in the pathophysiology of substance addictions as the reward deficit caused by the hypodopaminergic state predisposes the individual for multiple drug-seeking behaviors which have propensity to fix the dopamine deficit, setting right this genetic glitch. The same phenomenon is observed in many behavioral addictions. Hence behavioral addictions can be viewed as a spectrum ranging from impulsive compulsive disorders to reward deficiency syndrome^[1].

It has been observed that persons with substance addictions have comorbid behavioral addictions as well, and this can be seen even before a person starts using any substance. Neurobiological, genetic and environmental predispositions underlying the development and maintenance of substance addictions is well elucidated.

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However the heterogeneity and lack of proper empirical criteria to classify the different behavioral addictions make it difficult to formulate paradigms of genetics and neurobiology.

Gambling addiction was earlier classified under impulse control disorder but has now found its place rightfully in the addictive disorders. The brain areas involved in gambling addiction are vmPFC and the orbitofrontal along with neurotransmitter norepinephrine, serotonin and dopamine which are similar to impulsive and compulsive disorders. The defects seem to be associated more with impulsive choice defects than impulsive actions. In more severe cases of gambling disorder there is a role for compulsivity. Further there is hyper-dopaminergia than hypo-dopaminergia in gambling disorder. Therefore this seems a highly impulsive compulsive disorder with little reward deficiency evidence^[2].

Bleuler described impulsive in-

sanity and included compulsive buying, kleptomania and pyromania under it. These disorders have been studied extensively since then and have been grouped under obsessive compulsive spectrum disorders in DSM-5. Compulsive buying is now being considered as a form of behavioral addiction with neurobiological similarity to impulsive-compulsive disorders^[3]. There is a clear defect of impulsive choice as evidenced by the suppression of the vMPFC and ventral striatum and the activation of insula in the decision phase of buying. The disorder has however a higher evidence for a compulsive phase than gambling disorder with significant anterior cingulate cortex (ACC) and dorsolateral prefrontal cortex (DLPFC) suppression during the compulsive phase. This opens up the possibility that compulsive buying disorder lies at the impulsive-compulsive end of the spectrum of behavioral addictions, followed by gambling addiction which has lesser evidence for compulsive phenomenon.

Although loss of control over excessive Internet use is considered as an addictive disorder by a number of researchers, an official diagnostic criterion has not been devised yet. Several structural and functional imaging studies have found limbic system and prefrontal cortex to be the core neural substrates in both aggression and internet gaming disorder. The models show a defective valuation system and impulsive choice defects in internet gaming with involvement of vMPFC, ventral striatum and also ACC. Apart from this, reward deficiency syndrome has also been implicated in the causation of this disorder. Hence it could be seen as lying in between the two ends of the spectrum with an even proportion of both impulsive compulsive and reward deficiency defects^[4].

Research in sexual addictions is in the infancy stage as evident from it still being classified as hypersexual disorder in DSM-5 even though early evidence points to it being linked to the reward deficiency syndrome. There are a wide range of behaviors which this disorder encompasses right from socially accepted non-paraphilic behaviors like compulsive cruising and multiple partners, compulsive masturbation, pornography or phone sex, compulsive cyber-sex, habitual infidelity, obsessive preoccupation with romantic or sexual thoughts to paraphilic behavior, child molestation and rape. Hence it is not only the reward deficiency which plays a role in sex addiction but also some amount of choice issues as well which dictates what behavior the person engages in. So this seems to move more from the impulsive compulsive to the reward deficiency side of the spectrum.

The glucose bingeing which occurs in food addictions releases the “pleasure molecule” also known as the “anti stress molecule” dopamine in the reward centre of the brain^[5]. Food addiction research shows that binge eating is the more definitive addiction than other eating disorders and most biological

correlates are drawn from this. Persons with reward deficiency syndrome find it pleasurable as the dopamine deficit if overcome every time they binge leading to addictive behavior as they learn to find pleasure. The amount of dopamine released in response to psychoactive substances is very high in comparison with any other substance or behavior, increasing its propensity to cause addiction in persons with genetic predisposition of reward deficiency syndrome. This put forward the possibility that food addictions lie at the extreme end of the behavioral addiction spectrum moving from impulsive compulsive behaviors to the reward deficiency syndrome with similar correlates to substance addictions which are the prototype reward deficiency phenomena.

To conclude behavioral addictions encompass a heterogeneous group of disorders with diverse etiologies making it difficult to classify them and even formulate definite diagnostic criteria. However they could be seen as ranging from impulsive compulsive disorder with both strong evidence for impulsive and compulsive defects as compulsive buying, to impulsive compulsive disorder with more impulsivity and compulsivity only at extreme phases like gambling disorder, further towards a mixture of impulsive compulsive and reward deficiency syndrome phenomenon like internet gaming disorder. The next entity in the spectrum is sexual addiction which has predominant reward deficiency with a lesser evidence for impulsive-compulsive phenomenon. Finally the spectrum culminates with a more pure reward deficiency syndrome like food addiction which seems no different to substance addiction in this aspect. However further research is warranted to test this hypothesis and to shed light on this group of disorders so that they can be called the addiction spectrum disorders.

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