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Behavioral Addictions: The Substance of "Non-Substance Related Addictive Disorders"

Ahmed Yousif Ali*

National Rehabilitation Center, Abu Dhabi, United Arab Emirates

ABSTRACT: *There has been an increased interest in the last decade about non-substance related addictive disorders. Classification systems started incorporating them, explicitly in their manuals signaling an acceptance brought by the growing scientific evidence (neurobiological, phenomenological, and developmental) of the validity of the diagnoses. In 2013, "gambling disorder" became the first no-substance related diagnostic entity to be included in an international manual, the DSM-5. The World Health Organization followed suit and in June 2019 added both "gambling disorder" and "gaming disorder" in their diagnostic system the ICD-11. These disorders or "behavioral addictions" include impulsive, obsessive & compulsive and addictive behaviors. They deserve more attention from scientist as they share natural history with substance use disorders and afflict young people with long-term consequences. We need to view behavioral addiction as extreme ends on the spectrum of behaviors, where the quality and quantity of the behavior have to be assessed thoroughly to ensure we do not mislabel some excessive behaviors as psychiatric disorders. Tools to enable us to are that distinction and interventions to help patients are being developed.*

KEYWORDS: *Gaming Disorder; Gambling Disorder; Kleptomania; Pyromania.*

INTRODUCTION

Currently addictions are broadly divided into two main groups, namely, substance-related and non-substance related addictive disorders. The two main classification systems, the Diagnostic and Statistical Manual of the American Psychiatric Association 5th edition (DSM-5), (American Psychiatric Association, 2013) and the World Health organization's International Classification of Diseases 11th revision (ICD 11), (World Health Organization, 2004) take different approaches to the two groups of disorders epitomizing the divisions among the scientific community.

The DSM-5, released in 2013, includes "gambling disorder" in the Substance -Related and addictive disorders chapter and subsumes "internet gaming disorder" under section 3 of the classification system, which is reserved for conditions that require further research ("Emerging Measures and Models").

The World Health Organization (WHO) released their classification system in May/June 2019 and is to come into effect on 1st January 2022. Chapter 6 of ICD 11 is dedicated to Mental, behavioral or neurodevelopmental disorders. It includes "Disorders due to substance use or addictive behaviors" and the corresponding two groups of health conditions:

*Correspondence regarding this article should be directed to: ahmedyousif.ali@gmail.com

(i) Disorders due to substance use, and

(ii) Disorders due to addictive behaviors.

Under rubric (ii) we find both "gambling disorder" and "gaming disorder". The rationale for including them is due to "the evidence of neurobiological, phenomenological, developmental and outcome similarities between gaming and gambling disorders and substance use disorders", as stated in the manual. It is worth noting that the ICD11 has gone a step further than DSM-5 by omitting the word internet from the term internet gaming disorder, apparently in response to challenges from many researchers, stating that gaming does not have to be online and the term causes "chaos and confusion" (Griffith, et al. 2016; King, et al. 2013.)

Non-substance related addictive disorders or "behavioral addictions" involve a myriad of observed departures from normal behavior that are considered excessive, impulsive, obsessive & compulsive or frankly addictive according to international classification systems. Some of these behaviors especially those related to technology are causing concern. Many families are frequently troubled by a member's indulgence, and worry if the excessive use is an addiction or not, and what could be done about it. Behavioral addictions share common grounds with substance use disorders mainly natural history, phenomenology, young age of onset and the long-term consequences. Researchers continue to debate how best to classify them with obvious implications on

awareness, prevention, taxonomy, clinical description and management. It is important to differentiate between these disorders or addictions and the lifestyle choices. We need to remember that addictions cause harm to the individual, their families or society at large and dominate the lives of those affected causing loss of control. The main distinction is that pleasurable lifestyle choices improve quality of life unlike these disorders.

TIMELINE AND NOMENCLATURE: 1956: The first mention of a non-substance entity causing a behavioral addiction is probably that food can be addictive by Randolph. (Randolph,1956).

1957: Gambling, a close second, flagged up as a non-substance addiction. The term first appeared in 1957 during the Gamblers Anonymous (GA) meetings.

1964: The WHO replaces the diagnosis of addiction with the label "dependence" (seemingly neutral, more appropriate and less stigmatizing). (O'Brien, et al. 2006). The DSM system continued to use the term dependence through the 3rd (DSM–III) and 4th (DSM- IV) revisions and only replaced dependence with addiction in the 5th revision or DSM-5.

1970s: The digital age begins; current dilemmas of technology addiction emerge.

1980: DSM used the criteria for pathological gambling with obvious similarities to substance dependence (tolerance, withdrawals, repeated failures in attempts to quit and interference with functioning)). (Spitzer, et al. 1980).

1983: Patrick Carnes publishes his book: Out of the Shadows: Understanding Sexual Addiction. He describes sexual compulsivity and sexual anorexia as "sex in the extremes". (Carnes, 2001).

1995: Dr. Ivan K. Goldberg wanted to demonstrate the complexity and rigidity of DSM handbook. He conjured up what he called "Internet addiction disorder" (I.A.D.). He posted it as a parody of the classification system. He took pathological gambling, as diagnosed by the (DSM-IV), as his model for the description of I.A.D (Goldberg, 1996).

1995: Kimberly Young founded the Center for Internet Addiction Recovery and published a book about internet addiction. (Brand, et al. 2019).

2001: One of the first articles addressing the issue of behavioral addictions was by Holden.

He asked in an article "if they existed". (Holden,2001).

2004: Shaffer et al develop a syndrome model of addictions that joined SUDs and behavioral addiction. They argued that addictions share neurobiological, and psychosocial precursors that increase the vulnerability for pathogenesis. Only if the precursors are combined with exposure to and interaction with addictive behavior will the person develop addiction. (Shaffer, et al. 2004).

2008: An editorial in the American Journal of Psychiatry suggests that internet addiction be included in the Diagnostic and Statistical Manual (DSM-5).(Block, 2008).

2012: A study of almost twelve thousand adolescents in eleven European countries, found a 4.4 per cent prevalence of what the authors termed "pathological Internet use. (Durkee, et al. 2012).

2013: DSM includes gambling disorder under substance related and addictive disorders.

2019: The WHO includes gambling disorder and gaming disorder under disorders due to addictive behaviors in ICD 11.

THE SYNDROMES: Non-substance related or "Behavioral addictions or disorders," are also known as "process addictions" or "impulsive-compulsive behaviors" and a very helpful classification of these addictions is to consider their forensic implications and divide them into two groups (Ascher, et al. 2015):

- With forensic implications: (gambling, internet gaming, internet addiction, kleptomania, sexual addiction, buying addiction, pyromania).
- With no forensic implications: compulsive exercising, compulsive eating, compulsive tanning and other compulsive behaviors like trichotillomania, and compulsive excoriation.

GAMBLING DISORDER: In 2013, the DSM-5 included gambling disorder, as a recognized addiction, hence a mental illness, including it under the rubric of "substance related and addictive disorders".

It is the first non-substance disorder to be classified as an addiction opening the door for other behavioral addictions to be included in the future in international classification systems.

Gambling disorder was not included in the previous editions of the DSM. In DSM (1V-TR) "pathological gambling disorder" was included under Impulse Control Disorders Not Otherwise Specified or ICDs, NOS" and not under the substance use disorders. Along with pathological gambling disorder, the category included intermittent explosive disorder, kleptomania, pyromania and trichotillomania. At that stage some disorders like pathological skin picking, compulsive sexual behavior and compulsive buying were also classified under ICDs, NOS. In comparison, the equivalent category under ICD 10 was called habit and impulse disorders (F63), and included together with pathological gambling the same disorders above except intermittent explosive disorder.

The causal theories generally put forward for addictive disorders include that it could be a consequence of mental disorder (self-medication), or the mental disorder is induced by the addiction (induction) and shared risk factors (reciprocity). (Krausz,1996).

The neurobiological similarities between gambling and Substance use disorders include: the neurotransmitters involved (D2/D3 receptors), Parkinson disease medications effects, fMRI results showing involvement of VmPFC (ventromedial prefrontal cortex) & risk reward decision, decreased activation in cocaine related videotapes and gambling related IGT (IOWA Gambling Task). (Potenza, 2013).

Genetic studies of the Vietnam era twin registry showed the co-occurrence of both genetic and environmental factors in pathological gambling. The Australian twin registry also showed the strong genetic link with two thirds of association in alcohol and pathological gambling in males.

To diagnose the disorder the DSM-5 defines it as "persistent and maladaptive gambling behavior as indicated by a minimum of 4 out of 9 required criteria in the past 12 months". Many assessment tools are available to help clinicians diagnose and manage the disorder and a most experts recommend the Gambling Timeline Followback (Weinstock, et al. 2004). This tool provides a baseline record of the patient's gambling behavior in the previous 30 days. It is then repeated during follow up to provide patients with important feedback, psychoeducation and for monitoring progress.

Clinically, patients are typically trapped in a vicious circle of "chasing losses" (trying to win back lost sums of money "bailouts" (hope for rescue from others around them), they also and respond to negative emotions by gambling more, ending up in serious difficulties affecting all aspects of their livelihood (legal, financial, relationship etc...). The rules of chance dictate that any gambler will experience a win, large or small, and this have been likened to the "high of addiction".

It is puzzling why people continue to gamble despite the odds of winning being so low. Cognitive distortions (bias and irrational thoughts) have been suggested. A good summary of the literature on these distortions can be found in an excellent paper by Labrador, et al. 2020.

The delay in seeking help for their addiction is a consequence of many factors such as their ambivalence (not dissimilar to substance related disorders), lack of insight and the cognitive distortions described above.

Petry also described the cognitive distortions experienced by gamblers as: gamblers fallacy (the belief that a string of losses must predict an imminent win, availability heuristic (selective recall of wins over losses), failure to recognize net losses that include some small wins, that his need to win will affect outcome, beliefs about luck. (Petry, 2005).

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The list of comorbid disorders summarized in a critical review by Crockford, et al. in 2011 include the following: mood and anxiety disorders (37%), personality disorders (48 % among treatment seekers), substance related disorders (57.5 % also stated as 7 fold greater in gamblers than non-gamblers) while bipolar , attention deficit & obsessive compulsive disorders were (<10%) .There is a range of biopsychosocial and spiritual interventions available to treat gambling disorder. These include: motivational interviewing, cognitive and cognitive behavioral treatments and self-help groups the Gamblers Anonymous or GA, which is based on the 12-step approach borrowed from the Alcoholic Anonymous. There are no currently approved medications for treating the disorder but clinicians often prescribe the following targeting specific symptom clusters like anxiety and depression by selective Serotonin Inhibitors (SSRIs), Selective Noradrenaline inhibitors (SNRIs), Selective Dopamine Reuptake inhibitors (SDRIs), anticonvulsant medication or Lithium for the impulsive subtype. Opioid antagonist Naltrexone and N-Acetyl cysteine have been used to control urge and craving. Baclofen, Nalmefene, Memantine are also among the list of medicines that have been investigated, with some promise but none had been licensed to treat the disorder. (Grant, 2010).

Of note, patients receiving dopamine-boosting treatment for Parkinson's disease have sometimes developed excessive eating, shopping, sex and gambling habits, suggesting there may be a biological link that drives all of these behaviors.

GAMING DISORDER: Gaming disorder is classified as an addiction in the ICD 11 together with Gambling disorder. The DSM-5 (which uses the term Internet gaming disorder or IGD) did not include it as a diagnostic entity and deemed it a "condition warranting more clinical research". It is also referred to in the literature as problematic gaming or gaming addiction.

In ICD 11 gaming disorder is characterized by a pattern of persistent or recurrent gaming behavior ('digital gaming' or 'video-gaming'), and is divided into:

- Gaming disorder, predominantly online.
- Gaming disorder, predominantly offline.

It is manifested by:

1) Impaired control over gaming (e.g., onset, frequency, intensity, duration, termination, context).

2) Increasing priority given to gaming to the extent that gaming takes precedence over other life interests and daily activities.

3) Continuation or escalation of gaming despite the occurrence of negative consequences. The behavior pattern is of sufficient severity to result in significant impairment in personal, family, social, educational, occupational or other important areas of functioning. The pattern of gaming

behavior may be continuous or episodic and recurrent. The gaming behavior and other features are normally evident over a period of at least 12 months in order for a diagnosis to be assigned, although the required duration may be shortened if all diagnostic requirements are met and symptoms are severe. (ICD 11).

The prevalence rates of ICD 11 gaming disorder (and DSM-5 internet gaming disorder) in many studies ranged from 1.2% to 8.5% depending upon country and screening instrument used. (Griffith, et al. 2018).

A distinction needs to be made between someone who may use games excessively but non-problematically and someone who is experiencing significant impairment in their daily lives as a consequence of their excessive gaming. (Kuss, et al. 2017). It has been hypothesized that IGD represents maladaptive or dysfunctional coping, lending a hand to self-medication hypothesis. In 2013 the Entertainment Software Association reported that 58% of Americans play video games and about a third are under the age of 18. The massively multiplayer online role-playings games or MMROGs are associated with significantly more impairment than other types of internet gaming. (Scott, et al. 2013).

It is prudent to incorporate questions about internet use in psychiatric evaluations of children and young people specially on smartphones and not only on computers. Multiple assessment tools are available to help clinicians including some game specific tools like the Gaming Assessment scale (GAS) or General internet use tools like Compulsive Internet Use scale (CIUS). The DSM-5 proposed criteria are also useful and available in 11 languages.

A systematic review of treatments offered found that out of 26 studies 13 focused on treatments for IGD and 13 on Internet addiction. The authors listed the results they concluded were: "a paucity of well-designed treatment outcome studies and limited evidence for the effectiveness of any treatment modality. In addition, the field is beset by a lack of consistent definitions of and established instruments to measure IGD and Internet addiction. (Zajac, et al. 2017).

THE INTERNET ADDICTION CONUNDRUM: It is important to understand the terminology used to describe the behaviors associated with excessive use of the internet. These behaviors are grouped together under an encompassing term "Technology addiction" or digital addiction which includes: internet addiction (IA) or Internet addiction disorder (I.A.D), problematic internet use (PIU), compulsive Internet use (CIU), Internet overuse, problematic computer use or pathological computer use (PCU) and finally problematic Internet use (PIU).

INTERNET ADDICTION: It is a term used to describe a group of behavioral addiction phenomena encompassing the pervasive experience of the internet itself and not just the effects of online gaming. I.A is not listed in the DSM-5 or ICD 11. (Ascher, et al. 2015). It can be defined as the activity that an individual is taking part of while they are online, in an obsessive or compulsive fashion. The list includes behaviors like general computer addiction, online shopping, online communities and chat rooms (cyber relationships), social networking (SNS) internet pornography and virtual sex (Cybersex), online gambling compulsive surfing of the web, and multiplayer games (although gaming is now part of the Internet gaming Disorder diagnosis). IA can lead to functional impairment due to withdrawal from social and occupational arenas. It puts a strain on relationships as well as personal suffering due to the time spent and the repeated failure to control the behavior.

Comorbidities reported include: anxiety, depression, OCD, ADHD. Prevalence rates vary from country to country. (Park, et al. 2017).

OTHER DIAGNOSTIC ENTITIES

HYPERSEXUAL DISORDER (HD) OR SEXUAL ADDICTION (SA):

The concept of sex addiction is controversial. It has been repeatedly observed in clinical presentations that a repetitive, out of control, compulsive sexual behavior needs to be addressed and investigated. It has been described as sexual addiction, hypersexual behavior, paraphilic and non-paraphilic- related behavior. Non-Paraphilic type includes: pursuit of multiple partners, attending strip clubs, pornography, masturbation and paying for sexual activities. The paraphilic type includes nonconventional objects, situations and individuals (Exhibitionism, voyeurism, pedophilia, sexual masochism, sexual sadism, transvestic fetishism, fetishism, and frotterurism). (Fong, 2006).

The suggestion that sexual addiction is analogous to chemical addiction, and hence a diagnosable entity is credited to Carnes, who wrote in 1983 and in 1991 a detailed account of the pattern of out of control sexual behavior that can be compared to the DSM diagnosis of substance dependence. Goodman took the concept further (Goodman 1998) then Kafka (2010) with criteria proposed for the disorder.

The diagnosis of hypersexual or compulsive sexual behavior can be made using ICD-10 and DSM-5 despite rejection of this diagnosis by the American Psychiatric Association. The reason is that in 2015 the use of the diagnostic codes of ICD-10 became obligatory in the United States, enabling its diagnosis through the DSM through the coding system. (Krueger, 2016).

HD is not a diagnosis in the DSM-5 nor the ICD11 (due to insufficient data to include it in the manual in either). DSM-111 (APA 1980), however, included a section of psychosexual disorders and the corresponding syndrome would fit in the sexual disorder not otherwise specified part of the section. The consensus among the various approaches is that the disorder is:

- Characterized by repetitive and excessive sexual behavior (quantitative & qualitative)
- Generally, outside the context of sustained intimate relationships
- Urges to perform such sexual behavior akin to drug craving found in chemical addictions,
- Continuation of the behavior despite obvious potential of harm in many domains

Failure to stop despite repeated efforts. (Ascher, et al. 2015). The dopaminergic reward circuitry is once again involved, as it is in other chemical and behavioral addictions. The neurobiological substrates involve two brain areas namely the Ventral tegmental area in the midbrain and the nucleus accumbens in the striatal system. Both chemical and behavioral addictions dysregulate the system.

Treatment involves multiple modalities but none has proven to be superior. Individual psychotherapy (cognitive behavioral or psychodynamic), motivational enhancement, group therapy and self-help groups have all been studied. There are no FDA approved medications for the disorder but SSRIs and antiandrogenic medicines have been tried

FOOD ADDICTION (FA): The existence of food addiction as a diagnosable disorder in the classification systems is gaining momentum but currently it is not included in either of the DSM or the ICD classifications. In 2013 it was reported that the interest in food addiction (FA) increased 7-fold in Medline indexed papers using the term since 2008 (from 9 papers in 2008 to over 65 papers in 2013). (Salamone, 2013).

If we consider the argument for accepting (FA) in the classification systems the following opinions give weight to the argument:

- FA should have been included in the DSM-5 based on the same rationale for including Gambling addiction (GA) specifically that the same argument applies that GA activates the same reward pathways as drugs of abuse.
- The neurobiological overlap between FA and drug addiction is well documented in animal and human research (Avena, et al. 2012; Nolan, 2012).
- In their study Rosa. et al. conclude that FA diagnosis is highly associated with DSM-5 eating disorders and might overlap with some diagnoses. Patients with FA exhibited impairment comparable to substance use disorder patients. They conclude" there is an overlap between the proposed criteria for food addiction with both SUD and eating disorders." (Rosa, 2015).
- Drugs of abuse are known to impact up on the same neuronal pathways that regulate the motivation to seek and consume food and that in both obesity and drug addiction the dopamine pathways are disrupted. (Volkow, et al. 2013)

Of course, there are reasonable conservative views recommending more research before the inclusion of FA as an addictive disorder.

OTHER NON-SUBSTANCE RELATED ADDICTIVE DISORDERS: Other behavioral addictions that need further investigation and beyond the scope of this article include: exercise addiction, texting & Emailing, kleptomania, love addiction, shopping addiction, tanning addiction, work addiction (Pies, 2009).

CONCLUSION

The inclusion of gambling disorder and gaming disorder in the two main classification systems, DSM and ICD, opens the door for more behavioral addictions to be included. But as Amanda Heller sharply observed: "If every gratified craving from heroin to designer handbags is a symptom of 'addiction, 'then the term explains everything and nothing. It is very important that as with the rest of the medical field, these syndromes are only labelled after sufficent prosepective logitudinal research is conducted, and the public are assured that there is convincing evidence that they constitute disorders that warrant the label. Assessment tools and interventions need to be available, so that clinicians can be trained on them and can help patients and their families in their struggle with these chronic disorders. Current neurobiological, neuroimaging and neurochemical (opioid, glutamate, dopamine and serotonin) evidence of overlap between non substance related and substance related disorders seems to support their existance as reliable diagnoses.

DECLARATIONS

The author declare no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

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