Diagnostic instruments for behavioural addiction: an overview

Diagnostische Instrumente der Verhaltenssucht: ein Überblick

Abstract

In non-substance-related addiction, the so-called behavioural addiction, no external psychotropics substances are consumed. The psychotropic effect consists of the body’s own biochemical processes induced only by excessive activities. Until recently, knowledge was limited with respect to clinically relevant excessive reward-seeking behaviour, such as pathological gambling, excessive shopping and working, which meet diagnostic criteria of dependent behaviour. To date, there is no consistent concept for diagnosis and treatment of excessive reward-seeking behaviour, and its classification is uncertain. Therefore, a clear conceptualization of the so-called behavioural addictions is of great importance. The use of adequate diagnostic instruments is necessary for successful therapeutical implications.

This article provides an overview of the current popular diagnostic instruments assessing the different forms of behavioural addiction. Especially in certain areas there are only few valid and reliable instruments available to assess excessive rewarding behaviours that fulfill the criteria of addiction.

Keywords: behavioural addiction, diagnoses, psychometric instruments

Zusammenfassung

Bei der stoffungebundenen Sucht, der sog. Verhaltenssucht, werden keine psychotropen Substanzen von außen zugeführt bzw. eingenommen. Der psychotrope Effekt ergibt sich aus körpereigenen biochemischen Veränderungen, die durch bestimmte exzessive, belohnende bzw. belohnungssuchende Verhaltensweisen ausgelöst werden.

Bisher gibt es wenig Kenntnisse über klinisch relevantes exzessives, belohnendes bzw. belohnungssuchendes Verhalten wie pathologisches Spielen, exzessives Kaufen und Arbeiten, das die diagnostischen Kriterien einer Abhängigkeitserkrankung erfüllt. So gibt es bislang auch kein einheitliches Konzept für die Diagnostik und Behandlung solcher exzessiven, belohnenden bzw. belohnungssuchenden Verhaltensweisen, da ihre Klassifikation weiterhin unklar ist. Deshalb ist eine eindeutige Konzeptualisierung der sog. Verhaltenssucht von wesentlicher Bedeutung.

Für die Ableitung erfolgreicher therapeutischer Maßnahmen ist der Einsatz adäquater diagnostischer Instrumente notwendig. Dieser Artikel gibt einen Überblick über die derzeit gängigen Diagnoseinstrumente der verschiedenen Formen der Verhaltenssucht. Dabei zeichnet sich ab, dass für bestimmte Bereiche exzessiver Verhaltensweisen, die die Kriterien einer Abhängigkeitserkrankung erfüllen, nur wenig valide und reliable Diagnoseinstrumente verfügbar sind.
Introduction

At the end of the 19th century, gambling addiction as a non-substance-related or behavioural addiction was already well-known by experts. In addition to several forms of substance-related addiction, such as alcohol, morphine and cocaine, gambling addiction was described in the literature of that time [1]. Recently, discussion of an adequate nosology and classification of behavioural addiction has been revived.

To date, there is no consistent concept for diagnosis and treatment of excessive reward-seeking behaviours, and its classification is uncertain. Therefore, a clear conceptualization of these so-called behavioural additions is of great importance, and the use of adequate diagnostic instruments is necessary for successful therapeutic implications. Not every excessively conducted behaviour is addictive behaviour. Subjects had to fulfill the criteria of addiction regarding their excessive behaviour for at least twelve months. Only an accurate diagnosis allows the differentiation between addictive behaviour, non-pathological excessive behaviour and excessive behaviour caused by other mental diseases.

Until recently, “non-substance related behavioural addiction” was not listed in the two internationally used diagnostic manuals of mental disorders, neither in the DSM-IV-TR (Diagnostic and Statistical Manual of Mental Disorders) [2] nor in the ICD-10 (International Classification of Mental and Behavioural Disorders) [3]. Since 1980, pathological gambling has been included in the Diagnostic and Statistical Manual of Mental Disorders. Pathological gambling is listed in the category of “disorder of impulse control not elsewhere classified”. It is only possible to categorize these excessive behaviours as “disorders of impulse control”. Therefore, an appropriate classification and a clear diagnosis with respect to the current state of knowledge is required for establishing effective strategies for both the prevention of and interventions for these psychological disorders.

From a neurobiological point of view, behavioural strategies that only indirectly affect neurotransmitter systems of the brain, can serve as reinforcers comparable to pharmacological substances that directly affect these systems (e.g., dopaminergic system, [4], [5], [6]). Indeed, recent findings support the assumption of common mechanisms that underlie development and maintenance of both behavioural and substance-related addiction (cf. [7], [8]). This leads to the assumption that excessively conducted behavioural strategies (e.g., excessive shopping/sport, pathological gambling/computer game-playing), which induce a specific reward effect in the body’s own biochemical processes, do have an addictive potential as well. This assumption is also supported by several clinical experiences and scientific investigations.

Therefore, several authors have postulated that the criteria of behavioural addiction are comparable with the criteria of substance-related addiction (e.g., [9], [5], [10], [6], [11]). Patients suffering from a behavioural addiction describe addiction-specific phenomena and diagnostic criteria, such as craving to conduct the behaviour excessively, psychological and physical withdrawal symptoms, loss of control, development of tolerance (increased behaviour) to induce and perceive the expected psychotrophic effect (e.g., pathological gamblers gamble several slot machines at the same time). In addition, the high comorbidity between behavioural addiction and substance-related addiction suggests comparable etiological mechanisms for their development. All in all, it seems appropriate to categorize excessively conducted behaviours which lead to suffering as behavioural addictions.

In addition, the frequent appearance of comorbidity, such as personality and affective disorders as described for substance-related addiction, is also observed in patients with behavioural addiction, but not in patients with impulse-compulsive disorders (e.g., [12]). Furthermore, the frequently described impulsivity as a personality feature is not only observed in behavioural addicts, but also in several other psychological disorders (e.g., [13]). Based on recent findings, it does not seem to be sufficient to categorize behavioural addiction as an impulse control disorder because of therapeutic implications and effective methods of intervention [8]. The analogy of clinical characteristics between substance-related and behavioural addiction also favors the classification of behavioural addiction as an addictive behaviour and thus as an impulse control disorder (e.g., [14], [15], [16], [7]). The most evident characteristic of addiction, i.e. continuous substance intake (addictive behaviour) despite negative consequences, which is associated with craving and lack of control, is also dominant in patients with behavioural addiction.

Due to the lack of a diagnostic guide, several authors developed psychometric instruments to assess the different forms of behavioural addiction. Using a standardized instrument to assess diagnostic criteria is of great importance for counteracting an inflationary use of the concept of behavioural addiction and for distinguishing pathological behaviour from normal (non-pathological) excessive behaviour.

Published instruments of behavioural addiction consist of newly developed or modified instruments that existed previously and were then refined. Due to the lack of statistical validation, the expressiveness of most of the instruments presented here is limited. Therefore, the presentation of the statistic quality criteria of most of these instruments has yet to be accomplished.

Statements on the statistical quality (e.g., validation and reliability) as well as the selectivity are frequently missing. Therefore, an accurate diagnosis is often not possible. The strength of most of the instruments presented here is their ability of delivering extensive and essential information for the diagnostic and therapeutic process. Further studies are necessary for the characterization and appropriate diagnosis of the different forms of behavioural addiction.

In the following, an overview of the most popular and most frequently described diagnostic instruments of behavioural addiction pertaining to several areas (gambling,
shopping, sport, working, computer, internet and sex) will be provided.

As a basic premise, considering the still limited practical use of the various assessment tools, validity and reliability data should be at least satisfactory for all of the instruments used in diagnostic assessment of “behavioural addiction”.

Most of the presented instruments are predominantly designed to establish a diagnosis. Furthermore, several instruments are also appropriate for assessing therapeutic processes sequentially, such as e.g. the “Gambler’s Belief Questionnaire” (GBQ) [17], which assesses gambling-associated cognitions, or the “Yale-Brown Obsessive Compulsive Scale - Shopping Version” (Y-BOCS-SV) [18].

Assessment of pathological gambling

Excessive gambling is the most commonly described form of behavioural addiction. Therefore, the amount and diversity of existing psychometrics is enormous. Many of the diagnostic instruments for assessing excessive gambling are derived from the existing diagnostic criteria of the classifications of mental disorders (iCD-10 [3]; DSM-IV-TR [2]), in which “pathological gambling” is indeed classified as an impulse control disorder, but operationalized as an addiction. New research results have increasingly led to the integration of further models of development and maintenance of pathological gambling into its diagnostics. Therefore, and due to new empirical evidence from basic psychobiological research, the addiction concept is widely discussed (e.g., [19], [20], [21]; for a review cf. [22], [9]). Furthermore, the significance of irrational beliefs, respectively contortions in the development and maintenance of pathological gambling (e.g., [23], [24]), is widely accepted and considered in its diagnostics. A crucial task regrading the diagnostics of excessive gambling lies in the precise assessment of the different, clinically relevant grades of risky, problematic and pathologic gambling.

Below, a few selected, commonly used self-assessment instruments and structured clinical interviews in assessing pathological gambling will be introduced, followed by instruments that assess beliefs and assumptions concerning pathological gambling.

The most commonly used and thoroughly evaluated screening instruments in assessing pathological gambling is the “South Oaks Gambling Screen” (SOGS) [25], which was developed twenty years ago for use in clinical samples in the context of self-assessment or in clinical interviews. The underlying criteria used by the SOGS are derived from the diagnostic criteria for pathological gambling used by the DSM-III-R (APA) [26]. On a critical note, we would like to point out that changes in the diagnostic criteria (e.g., in DSM-IV [27]) have not been incorporated into the SOGS. Furthermore, it needs to be considered that its application in non-clinical samples leads to a decrease in its accuracy in differentiating between pathological and non-pathological gamblers.

The evaluation of its reliability and validity resulted in a good consistency and convergent validity in relation to other instruments used in the assessment of pathological gambling, especially in comparison to the diagnostic criteria of the DSM-IV.

The “Canadian Problem Gambling Index” (CPGI) [28] was developed as a new instrument to assess problematic gambling in the general public. This questionnaire is divided into three sections. The first section is “Gambling Involvement”, which consists of items concerning the frequency of involvement, spending, and duration of involvement in a long list of gambling activities. The second section, “Problem Gambling Assessment”, consists of items which are based on criteria for pathological gambling according to the DSM-IV (APA) [27] and the items of SOGS [25], respectively. The third section, “Correlates of pathological gambling”, was designed to assess gambling-related attitudes, expectancies of winning and cognitive occupation with gambling as well as a family history of problematic gambling. According to the overall score, each respondent can be classified into five categories of gambling behaviour (ranging from non-gambling to problematic gambling). Evaluation so far has indicated satisfactory reliability and validity.

Another screening instrument for the assessment of pathological gambling, also referring to DSM-IV criteria (APA) [27], is the “Massachusetts Gambling Screen” (MAGS) [29]. MAGS assesses biological (tolerance, symptoms of withdrawal), psychological (impulse control disorder, guilt) and social concomitants and accompanying symptoms of pathological gambling by using two subscales, one being based on items from the “Short Michigan Alcoholism Screening Test” (SMAST) [30] and the other on DSM-IV criteria (APA) [27]. MAGS exhibits good validity regarding DSM-IV criteria and a satisfactory consistency.

A simpler and more economical instrument for clinical use is the adaptation of the general “Yale-Brown Obsessive Compulsive Scale” (Y-BOCS, [31]; cf. “Assessment of Compulsive Buying” below) to pathological gambling (PG-Y-BOCS) [32]. This specific version of the Y-BOCS shows a high concurrent validity with the SOGS and satisfactory psychometric characteristics.

The “National Opinion Research Center DSM-IV Screen for Gambling Problems” (NODS) [33], which is also based on DSM-IV criteria for pathological gambling, contains two scales assessing problematic gambling in one’s lifetime and in the last 12 month. Individual classification into non-problematic, problematic and pathological gambling is possible by using the overall score. According to preliminary findings, NODS exhibits a good test/retest reliability as well as reasonable sensitivity and specificity in recognizing pathological gamblers.

A concise self-assessment instrument with high sensitivity and specificity is the “Lie/Bet Questionnaire” [34], [35]. It consists of only two items: “Have you ever felt the need to bet more and more money?” and “Have you ever had
to lie to people important to you about how much you gambled?".

Structured clinical interviews for diagnosing pathological gambling are scarce. Of the few interviews (still in the pilot stage) the "Structured Clinical Interview for Pathological Gambling" (SCI-PG) [36] is introduced here as an example. The SCI-PG consists of 10 items that assess DSM-IV criteria (APA) [27] for pathological gambling (10 items assessing inclusion and one item assessing exclusion criteria). As for a DSM-IV diagnosis of pathological gambling, subjects have to fulfill five or more items regarding inclusion criteria and one regarding the exclusion criterion ("is not better accounted for by a manic episode") to be diagnosed with pathological gambling. In clinical samples of pathological gamblers the SCI-PG is highly sensitive, specific and possesses good prognostic validity.

It is well known that cognitive contortions, such as gambling-related cognitions and effect expectancies play an important role in the development and maintenance of pathological gambling (e.g., [23], [24]). These specific cognitive contortions, which are relevant for treatment, are most commonly assessed using self-assessment instruments. Some of them will be introduced below.

The "Gambling Attitudes Scale" (GAS) [37] assesses attitudes (affective, cognitive and behaviour-related aspects) concerning gambling in general and specifically in casinos, horse betting and lottery, which can foster the development of pathological gambling.

Even though extensive evaluations concerning its validity have yet to be performed, internal consistency and test/retest reliability of the GAS scales are good. The "Gambling Attitude und Belief Survey" (GABS) [38] assesses cognitive contortions, irrational assumptions and positive attitude towards gambling. In addition, the degree of excitement during gambling is obtained. Gamblers that generate a high overall score, experience gambling as exciting, socially meaningful and focus on luck and winning strategies. The GABS exhibits good internal consistency and high convergent validity with the SOGS.

The "Gambler's Belief Questionnaire" (GBQ) [17] assesses cognitive contortions, especially regarding chances of winning (e.g. assumptions on lucky and losing streaks). The GBQ shows high internal consistency, a suitable test/retest reliability and good convergent and concurrent validity, e.g. with the SOGS and the MAGS.

The "Informational Biases Scale" (IBS) [39] which exhibits good internal consistency, can be administered when estimating specific cognitive contortions in gamblers that mainly use so-called video lotteries. In order to assess the irresistible craving for the addictive agent, which is regarded as a relevant specificity for both maintenance and relapse (e.g., [40], [15]) in gambling addicts the "Gambling Urge Questionnaire" (GUS) [41] was developed. It can be administered to clinical as well as non-clinical populations. The GUS shows a satisfactory internal consistency and good characteristics of concurrent, predictive and criteria-related validity.

In the manner of the "Situational Confidence Questionnaire-39" (SCQ-39) [42] the "Gambling Self-Efficacy Questionnaire" (GESQ) [43] assesses the self-efficacy pertaining to the subjective level of control over the gambling behaviour in varying risk situations. The items of the GESQ describe specific situations corresponding to the eight so-called "high risk situations" (negative and positive emotional state, negative physical state, experiencing urges and temptations, testing control, interpersonal conflict, social pressure and pleasant times with others) [44]. This makes the GESQ especially valuable in relapse prevention. The GESQ shows satisfactory internal consistency and possesses a high test/retest reliability coefficient.

Assessment of compulsive buying

One of the first instruments aimed at diagnosing excessive buying was the "Compulsive Buying Measurement Scale" [45]. According to the authors, its items reflect the four dimensions of pathological buying: a tendency to spend, feeling an urge to buy or shop, post-purchase guilt, and family environment. While its evaluation showed a good reliability and validity, it was noticed that high scores also corresponded to heightened anxiety levels and frequent occurrence of comorbid disorders such as bulimia nervosa, depression or alcoholism within the family.

The "Hohenheimer Kaufsuchttest [Hohenheim Shopping Addiction Test]" [46] is a modified German version of the "Compulsive Buying Measurement Scale" [45] and hence it differentiates between normal and pathological buyers by the same token. The "Hohenheimer Kaufsuchttest" exhibits high reliability and construct validity.

A newer screening instrument is the "Erhebung von kompensatorischem und süchtigem Kaufverhalten [Survey on Compensatory and Addictive Shopping Behaviour]" (SKSK) [47]. It is a self-assessment tool to record a potential tendency to and risk for compulsive shopping. The SKSK is also based on the "Compulsive Buying Measurement Scale" [45] and contains 16 items that assess the tendency for uncontrolled, maladaptive and excessive shopping. The instrument is one-dimensional and constitutes a continuum, reaching from inconspicuous and compensatory to compulsive buying. It postulates that compulsive buying is an extreme form of compensatory buying (meaning that the diverted behaviour is a problem-solving tool). The instrument features high reliability and construct validity.

Another screening instrument, the "Compulsive Buying Scale" [48] was introduced shortly thereafter. Its items were obtained from previous research and reports from affected individuals. The aim was to obtain knowledge of specific feelings, motivations and aspects of behaviour regarding compulsive buying. Scale evaluation revealed that the "Compulsive Buying Scale" is a valid and reliable instrument.

The structured "Minnesota Impulsive Disorder Interview" (MIDI) [49] assesses several psychopathological symptom...
Assessment of compulsive exercise

Prequels to diagnostic instruments used to assess exercise addiction were a psychoanalytically oriented interview [53] and the “Commitment to Running Scale” (CR) [54]. Some authors [55] criticized the underlying concept of the CR by claiming that an “addiction” and a “commitment to physical activity” are two separate constructs. While compulsive exercising is a process forcing individuals to engage in exercise despite any obstacles or to exhibit withdrawal symptoms in case that exercising cannot be conducted (“addiction”), commitment constitutes an engagement in physical activity out of pleasure and expected satisfaction. According to the assumptions that addictions can be classified into positive and negative ones (e.g., excessive running is positive, drugs are negative) [56] the interview by Sachs and Pargman and the CR screening instruments consider compulsive exercise to be a positive addiction. The CR has good to very good reliability and internal consistency. In contrast, the “Negative Addiction Scale” (NAS) [57] conceptualizes compulsive exercise, especially running, as a negative addiction [56]. Its items focus on the psychological and not the physiological aspects of compulsive running. Due to the lack of any psychometric characteristics, final estimations cannot be made about which score defines an individual as addicted to running.

The “Exercise Beliefs Questionnaire” [58] assesses individual assumptions regarding exercise based on four factors: “social desirability”, “physical appearance”, “mental and emotional functioning”, and “vulnerability to disease and aging”. It possesses good or satisfactory reliability, respectively.

The “Exercise Dependence Questionnaire” (EDQ) [59] assesses compulsive exercise as a multidimensional construct. It can be administered in assessing compulsion regarding a variety of sporting activities. The included scales are “interference with social/family/work life”, “positive reward”, “withdrawal symptoms”, “exercise for weight control”, “insight into problem”, “exercise for social reasons”, “exercise for health reasons”, and “stereotyped behaviour”. According to the authors, the EDQ is a reliable and valid instrument.

The “Exercise Dependence Interview” (EXDI) [61] assesses compulsive exercising as well as eating disorders. The EXDI evaluates excessive engagement in sporting activities in the previous three months, associated thoughts, its effects on and connections to the individual's eating behaviour, self-assessment of exercise dependence and further history data. So far no evaluation of its psychometric characteristics has been performed.

The “Commitment to Exercise Scale” (CES) [62] covers the pathological aspects of physical activities (e.g., continued exercising despite injuries) as well as compulsory activities (e.g., guilt after skipping exercise). CES exhibits a satisfactory level of reliability.

The “Exercise Dependence Scale” (EDS) [63] operationalizes compulsive exercise based on the DSM-IV criteria for substance dependence or addiction (APA) [27] and reasonably reliably differentiates between at-risk, dependent and non-dependent athletes as well as between physiological and non-physiological addiction.

The “Exercise Addiction Inventory” (EAI) [64], [65] is a short screening instrument aimed at identifying compulsive exercise. The EAI assesses the characteristic components of addictive behaviour: salience, mood modification, tolerance, withdrawal symptoms, social conflict and relapse [66]. The EAI features high internal consistency and convergent validity with the EDS.

The “Exercise Orientation Questionnaire” [67] reliably evaluates attitudes towards exercise as well as related behaviours. It consists of six factors: “self-control”, “orientation to exercise”, “self-loathing”, “weight reduction”, “competition”, and “identity”.

Albrecht et al.: Diagnostic instruments for behavioural addiction: ...
Assessment of workaholism

Since varying definitions of workaholism exist, its operationalizations also differ. Accordingly, the corresponding checklists and questionnaires have very distinct approaches. Furthermore, very few of these instruments possess the minimally recommended characteristics regarding scale assessment to estimate distinct aspects of behaviour.

In addition, most of these instruments are not based on theory and propose different dimensions. In general, there is a lack in the evaluation of psychometric characteristics and empirical analysis [68], [69]. Mentzel [70] equates workaholism with alcoholism and utilizes Jellinek's diagnostic criteria for alcoholism [71]. Mentzel's instrument is merely a list of items designed to encourage the affected individual to reflect on his/her behaviour (cf. [72]). Accordingly, no psychometric characteristics have been evaluated.

The "Work Attitude Questionnaire" (WAQ) [73] contains two scales covering the "commitment to work" and the extent of healthy vs. unhealthy attitudes and behavioural patterns regarding work. According to the authors, workaholism is not derived from the extent of qualitative and quantitative subjective focus on work, but from the attitudes and behaviours regarding mental health. The scale "commitment to work" assesses attitudes towards work and related behaviour. It was designed to divide interviewees into those with low vs. high commitment to work. The second so-called "health scale" is intended to establish a healthy or an unhealthy attitude towards work. The overall score is obtained by adding the scores of the two scales. WAQ enables discrimination between people who are extremely committed to work and workaholics. A high commitment combined with beneficial attitudes and behaviour concerning health indicates that the interviewee is challenged, stimulated and satisfied by work. In contrast, the combination of high commitment with unhealthy attitudes and patterns of behaviour is characteristic of employees exhibiting emotional, interpersonal and health problems, who are likely to be ineffective in their tasks. Accordingly, the authors distinguish between healthy and unhealthy workaholics. So far, no details about this instrument's reliability and validity have been published.

The "Workaholism Battery" (WorkBAT) [74] consists of three scales: "work involvement", "drive" as well as "enjoyment of work". The WorkBat shows satisfactory reliability, adequate internal consistency and reasonable convergent validity with organizational and personal variables. The "WorkBAT-R" [75] is a revised version of the "Workaholism Battery" [74]. While its authors identified three underlying factors in their instrument, other authors [74] could only establish the existence of two factors: "fun" (at work), that possesses very good reliability, and "drive" (to work), that appears to have good reliability.

Based on the observation that anankastic personality disorder and workaholism are intertwined diseases, the "Schedule for Non-adaptive Personality Workaholism Scale" (SNAP-Work) [76] was developed, which accordingly assesses personality-determined maladaptive, compulsive work habits. The SNAP-Work was found to exhibit a high internal consistency and good split half reliability.

Mudrack and Naughton [77] developed an instrument, which estimates the "tendency to engage in non-required work activities" (typically, spending time thinking of ways to perform work better) and "to intrude actively on the work of others" (typically, time and energy spent on taking responsibility for others). It can be adjusted to the specific work situation of the interviewee. The inter-item correlations are satisfactory.

Assessment of computer addiction

The existing instruments used to assess computer addiction are mostly based on the diagnostic criteria of pathological gambling and substance-related addictions, respectively. Since the symptom complex of computer addiction was initially reported in children and teenagers that excessively played video games, most of the instruments focus on video gaming behaviour in adolescence.

Due to the increasing relevance and public discussion of the topic of "excessive computer use in adolescence", several instruments pertaining to excessive computer gaming have been developed in the past few years. A few of those are introduced here.

Griffith [78] developed a questionnaire of excessive video game-playing in reference to slot machine addiction in adolescence, using the adapted DSM-III-R criteria for pathological gambling (APA) [26]. The behaviour is diagnosed as an addiction, if at least four criteria are met. Scale evaluation has yet to be performed.

The DSM-IV-JV (J = Juvenile, V = Arcade video game) [79] is a reliable instrument for diagnosing pathological video game use in adolescence. It is based on DSM-IV (APA) [27] criteria for pathological gambling. A diagnosis of pathological computer gaming can be made if at least four of its criteria are met.

The "Problem Video Game Playing Scale" (PVB) [80] assesses problematic video game playing in adolescence (13 to 18 years) with satisfactory reliability.

In order to assess computer game addiction of children in primary school age, Chiu, Lee and Huang [81] developed the "Game Addiction Scale", which differentiates between "game addiction" and "game concern". No psychometric characteristics have been established yet.

Modifying the "Internet Addiction Test" for adults [82], the "Computer-Related Addictive Behavior Inventory" (CRABI) [83] was developed in order to record computer-associated addictive behaviour. The reliability of CRABI is satisfactory.

A comprehensive instrument in assessing computer game behaviour in children is the "Fragebogen zum Computerspielerverhalten bei Kindern" (Questionnaire of Computer Game Behaviour in Children) (CSVK) [84]. The CSVK was developed for the German-speaking area in reference to the diagnostic criteria of pathological gambling as well as the diagnostic criteria of pathological gambling as well as...
as substance-related addictions according to the international classifications of mental disorders (DSM-IV [2] and ICD-10 [3]). It is a self-assessment tool which enables a diagnosis of “excessive computer gaming” as well as a survey on various related fields such as “family and living”, “leisure time and friends”, “school” and “television consumption”. It also provides information on emotional state, self-esteem, social acceptance and preferred problem-solving techniques. Previous analysis revealed that all seven items of the scale “diagnostic criteria” can be reduced to a single factor and that the instrument exhibits good specificity, internal consistency as well as reasonable reliability. Further evaluation of the CSVK items should involve an analysis regarding their psychological content.

Assessment of internet addiction

Based on the rising popularity of the internet in all parts of the society during the last decade, a variety of instruments assessing internet addiction were developed. Most of them are based on the DSM-IV criteria for substance-related disorders (APA) [27]. Since, in practice, it is a common experience that computer and internet addiction are difficult to differentiate, adequate diagnostics should involve the consideration of the two symptom complexes and, therefore, the use of instruments assessing both internet and computer addiction as well. A few select instruments will be introduced below.

Egger and Rauterberg [85] developed an “Online-Internaught-Fragebogen” [Online Internet Addiction Questionnaire] based on DSM-IV criteria assessing substance-related diseases (APA) [27]. Its validity and reliability have yet to be established.

Based on the same criteria, another instrument consisting of 32 items for estimating excessive internet use has been developed recently. This instrument, the “Internet-Related Addictive Behavior Inventory” (IRABI) [86] exhibits a satisfactory level of reliability. Furthermore, the “Internetsuchtskalen [Internet Addiction Scales]” (ISS) [87], a German instrument designed to obtain information on addiction-immanent features pertaining to internet addiction (e.g. loss of control, withdrawal symptoms, development of tolerance, continued execution of the excessive behaviour despite negative consequences regarding work and performance as well as social relationships) has proven to be both reliable and valid for diagnostics.

Other authors focus on the diagnostic criteria of pathological gambling of the DSM-IV for scale assessment. The “Diagnostic Questionnaire” (YDQ) [82] - in its revised version - distinguishes between “non-problematic internet use”, “frequent problems related to internet use” as well as “serious problems related to internet use”, employing 20 items. In a psychometric evaluation six valid and reliable factors could be extracted: “saliency”, “neglecting work”, “neglecting social life”, “excessive use”, “anticipation” and “lack of control”.

Recently, additional comprehensive and multi-dimensional instruments for the diagnosis of internet addiction have surfaced. One of them [88] is based on the four factors “problem behaviour/hard-core internet user”, “utilization of computer technology”, “internet use for sexual gratification/shyness/introversion”, as well as “absence of concern”.

The “Generalized Problematic Internet Use Scale” (GPIUS) [89] is based on the theoretical concept of the “generalized problematic internet use” [90]. The scale consists of seven subscales: “mood alteration”, “perceived social benefits available online”, “negative outcomes associated with internet use”, “compulsive internet use”, “excessive amounts of time spent online”, “withdrawal symptoms when away from the internet”, as well as “perceived social control available online”. The subscales of GPIUS correlate positively with depression, loneliness as well as shyness and negatively with the extent of self-esteem. According to the authors, the GPIUS is a reliable and valid instrument.

The “Online Cognition Scale” (OCS) [91] specifically focuses on internet-related cognitions and contains four dimensions: “diminished impulse control”, “loneliness/depression”, “social comfort”, and “distraction”. The OCS appears to be reliable.

The “Sample Questions for a Screening Interview Assessing Problematic Internet Use” [92] represent a half-standardized instrument for the assessment of problematic internet use. The five main sections of the interviews (presenting problem; biological, psychological and social areas, respectively; relapse prevention) are derived from a biopsychosocial approach [93]. Its reliability and validity have yet to be demonstrated.

Assessment of sexual addiction

The phenomenon of excessive sexual behaviour has hardly been examined until now and valid instruments in its assessment are scarce. The establishment of the quantity of sexual engagement (e.g., [93]) or the estimation of the frequency of risky sexual activities [94] neglects the complexity of the disorder and does not contribute to obtaining relevant addiction-related aspects, such as loss of control and development of tolerance.

So far, the screening test of sexual addiction [95] is the only available instrument in estimating sexual addiction. This test (like all other screening instruments) is designed to merely provide hints of the existence of the symptom complex and is available as a short (24 items) as well as a long (184 items) version. The short version requires 13 affirmative answers in order to establish the possibility of a sexual addiction. On a critical note it has to be said that the test is limited to being administered to homosexual males. It has not been validated for its use in women.

There are a variety of screening instruments on the internet for the special diagnosis of online sexual addiction. They cannot be discussed in detail here.
Assessment of various forms of behavioural addictions

A first approach for the comprehensive and standardized assessment of different forms of behavioural addictions (e.g., pathological gambling, workaholism, compulsive buying) is the German self-assessment questionnaire “Fragebogen zur Differenzierten Anamnese exzessiver Verhaltensweisen” (FDAV, Questionnaire on Differentiated Assessment of Excessive Behaviours) [96]. The FDAV is based on the criteria of substance-related addictions, pathological gambling and impulse control disorders of the ICD-10 [3] and the DSM-IV-TR [2]. The FDAV is a modified version of the “Fragebogen zur Differenzierten Drogenanamnese” (FDDA; Questionnaire on Differentiated Assessment of Addiction, QDAA) [97]. Its seven modules obtain “sociodemographic information” (e.g., age, profession, marital status), “history of excessive behaviour” (e.g., diagnostic criteria for addictions and impulse control disorder, individual patterns of behaviour, craving symptoms), “critical life events” (stress caused by traumatic events), “legal situation”, “medical history”, “physical and psychological complaints”, and “emotional state” (triggering psychological conditions, or consequences of the addictive behaviour, respectively). Every module can be administered separately according to the suspected behavioural addiction, thereby making the FDAV an economical tool in assessing behavioural addictions. The FDAV is suitable for diagnostics, evaluation of therapy and follow-up in clinical practice and research. Currently, the FDAV is being validated in clinical and non-clinical samples.

Characteristics of behavioural addictions

Grüsser and Thalemann [9] described relevant diagnostic characteristics of the different forms of behavioural addictions based on the present state of scientific findings and discussions. The authors view these characteristics as hints for the potential diagnosis of a behavioural addiction. However, they emphasize that in order to work against the inflational use of the term behavioural addiction, each individual case needs to be examined as to whether the suspected behaviour is in fact an addictive or just an excessive one (non-pathological or belonging to other diseases).

Characteristics of behavioural addictions according to Grüsser and Thalemann [9] include:

1. The behaviour is exhibited over a long period of time (at least 12 months) in an excessive, aberrant form, deviating from the norm or extravagant (e.g., regarding its frequency and intensity)
2. Loss of control over the excessive behaviour (duration, frequency, intensity, risk) when the behaviour started
3. Reward effect (the excessive behaviour is instantly considered to be rewarding)
4. Development of tolerance (the behaviour is conducted longer, more often and more intensively in order to achieve the desired effect; in unvaried form, intensity and frequency the desired effect fails to appear)
5. The behaviour that was initially perceived as pleasant, positive and rewarding is increasingly considered to be unpleasant in the course of the addiction
6. Irresistible urge/craving to execute the behaviour
7. Function (the behaviour is primarily employed as a way to regulate emotions/mood)
8. Expectancy of effect (expectancy of pleasant/positive effects by carrying out the excessive behaviour)
9. Limited pattern of behaviour (also applies to build-up and follow-up activities)
10. Cognitive occupation with the build-up, execution and follow-up activities of the excessive behaviour and possibly the anticipated effects of the excessively executed behaviour
11. Irrational, contorted perception of different aspects of the excessive behaviour
12. Withdrawal symptoms (psychological and physical)
13. Continued execution of the excessive behaviour despite negative consequences (health-related, occupational, social)
14. Conditioned/learned reactions (resulting from the confrontation with internal and external stimuli associated with the excessive behaviour as well as from cognitive occupation with the excessive behaviour)
15. Suffering (desire to alleviate perceived suffering)

The clinical perception as well as the increasing amount of scientific investigations emphasize the commonalities of substance-related and non-substance related behavioural addictions, respectively. Therefore, the standardized classifications of mental disorders should classify excessive behaviours meeting the criteria of addictions as an addiction disorder and operationalize them accordingly in the diagnostic criteria. Only then will it be possible to establish accurate diagnoses (by using valid and reliable instruments) and thus to facilitate effective treatment of affected individuals.

Notes

Conflicts of interest

None declared.
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