Internet and video game addictions: a cognitive behavioral approach

Dependência de Internet e de jogos eletrônicos: um enfoque cognitivo-comportamental

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**Abstract**

**Background:** While several benefits are attributed to the Internet and video games, an important proportion of the population presents symptoms related to possible new technological addictions and there has been little discussion of treatment of problematic technology use. Although demand for knowledge is growing, only a small number of treatments have been described. **Objective:** To conduct a systematic review of the literature, to establish Cognitive Behavioral Therapy (CBT) as a possible strategy for treating Internet and video game addictions. **Method:** The review was conducted in the following databases: Science Direct on Line, PubMed, PsycINFO, Cochrane Clinical Trials Library, BVS and SciELO. The keywords used were: Cognitive Behavioral Therapy; therapy; treatment; with association to the terms Internet addiction and video game addiction. Given the scarcity of studies in the field, no restrictions to the minimum period of publication were made, so that articles found until October 2013 were accounted. **Results:** Out of 72 articles found, 23 described CBT as a psychotherapy for Internet and video game addiction. The manuscripts showed the existence of case studies and protocols with satisfactory efficacy. **Discussion:** Despite the novelty of technological dependencies, CBT seems to be applicable and allows an effective treatment for this population.


**Keywords:** Cognitive behavioral therapy, treatment, Internet gaming disorder, Internet addiction, video game addiction.

**Resumo**

**Contexto:** Enquanto diversos benefícios são atribuídos à Internet e aos jogos eletrônicos, uma importante parcela da população apresenta sintomas relacionados a possíveis novas dependências tecnológicas, e pouca discussão tem ocorrido sobre o tratamento do uso problemático de tecnologia. Embora a demanda por conhecimento esteja crescendo, apenas um pequeno número de tratamentos tem sido descrito. **Objetivo:** Conduzir uma revisão sistemática da literatura e estabelecer a Terapia Cognitivo-Comportamental (TCC) como uma estratégia possível para o tratamento da dependência de Internet e de jogos eletrônicos. **Método:** A revisão foi conduzida nos seguintes bancos de dados: Science Direct on Line, PubMed, PsycINFO, Cochrane Clinical Trials Library, BVS e SciELO. As palavras-chave utilizadas foram: Terapia Cognitivo-Comportamental; terapia; tratamento; com associação aos termos Dependência de Internet e dependência de jogos eletrônicos. Dada a escassez de estudos no campo, não foram feitas restrições quanto ao período mínimo de publicação, de modo que os artigos encontrados até outubro de 2013 foram contabilizados. **Resultados:** Dos 72 artigos encontrados, 23 descreveram a TCC como um psicoterápia para a dependência de Internet e de jogos eletrônicos. Os manuscritos mostraram a existência de estudos de caso e protocolos com eficácia satisfatória. **Conclusões:** Apesar da novidade das dependências tecnológicas, a TCC parece ser aplicável e permite um tratamento eficaz para esta população.


**Palavras-chave:** Terapia cognitivo-comportamental, tratamento, transtorno do jogo pela Internet, dependência de Internet, dependência de jogos eletrônicos.

**Introduction**

The Internet has revolutionized communication, allowing for new forms of entertainment as well as the search for information. The World Wide Web has also remodeled the older patterns of relationships and it provides access to information in real time, independently of the physical distance between sender and receiver.

Video games are a form of contemporary media with their own aesthetics and interaction that demand the development of strategies and the understanding of potentially complicated rule sets, being cognitively challenging. This practice transports the user to an intimate interaction with the virtual world.

Only recently the scientific literature has started mentioning the problematic use of technologies. Internet addiction, for example, appeared in the medical literature in 1995. Problematic/addictive use of video games has been mentioned more recently, although games have been studied for decades in relation to other topics in user behavior such as aggression/violent content, education and therapeutic use.

Some authors argue that the addictive use, either of Internet or video games, presents neurobiological similarities with the substance use group, especially referred to the craving state and brain areas brain that respond to stimuli are similar from those of substance dependence and Internet addicts.

**Psychiatric characteristics**

The potential problematic/addictive use of Internet and video games has been discussed by researchers as part of newly suggested psychiatric diagnosis. Authors report the existence of a portion of the population with characteristics equivalent to addictive use of electronic resources. Internet and video game, as possible addictions, can be studied through the scope of addictive behaviors, that belongs to the impulse control disorder spectrum.

Some authors argue that the addictive use, either of Internet or video games, presents neurobiological similarities with the substance use group, especially referred to the craving state and brain areas responsible for rewards for the search of addictive stimulus. This is mainly due to the fact that the areas of the video game addict's brain that respond to stimuli are similar from those of substance dependence and Internet addicts.

**Internet addiction**

While there is still considerable controversy surrounding the exact definition of Internet addiction, there is some consensus on the following symptoms: a) persistent preoccupation with the Internet; b) increasing frequency of the time spent on the Internet; c) frequent unsuccessful attempts to control the time spent online; d) when cut down or interrupted the Internet use, the user feels tired, shaky, or depressed; e) irritability when the user attempts to stop the use of the...
Internet; f) longer permanence on the Internet in relation to what was previously planned; g) jeopardizing of important relationships or even professional work and education due to the use of the Internet; h) lying to others about the amount of time spent on the Internet; i) use of the Internet as a form of escapism for everyday problems.32

Comorbidities: video game addiction

A study revealed that players with autism spend more time using video games in relation to the group of players with ADHD or without psychiatric disorders.34 Another psychopathology related to video game addiction is major depression.35

Diagnostic instruments: internet addiction

Examples of current instruments to measure Internet addiction are: Internet Addiction Test,36 the Internet Related Problem Scale (IRPS)37 and the Compulsive Internet Use Scale (CIUS).38

Diagnostic instruments: video game addiction

Instruments of Video game addiction: Video Game Addiction Test (VAT),39 the Indonesian Online Game Addiction Questionnaire,40 the Problem Video Game Playing Scale (PVP)41 and the Game Addiction Scale (GAS).42

Cognitive behavioral therapy: a possible treatment?

Cognitive-behavioral therapy (CBT) is considered the first choice for treatment of various impulse control disorders (e.g., trichotillomania and pathological gambling), as well as some others containing expressive traits of impulsivity. The same model served as a selection parameter to Internet and video game addiction.43

CBT posits that individuals may exhibit psychological distress because of the negative way they interpret everyday situations that are commonly considered as neutral events. This therapy model uses a brief structured approach with active collaboration between therapist and patient whereas emotions, physiological reactions, thoughts and actions significantly interfere the way the person evaluate his/her own experiences.44 The cognitive model has three levels: a) automatic thoughts: characterized as rapid and spontaneous responses of the cognitive field; b) intermediate beliefs: rules developed by the individual him/herself; and c) core beliefs: a deeper level characterized as a synthetic and absolute form of interpretation about oneself and the surrounding reality.

The purpose of this article was to conduct a systematic review of the literature, to establish Cognitive Behavioral Therapy (CBT) as a possible strategy for treating Internet and video game addictions.

Method

The review was conducted in the following databases: Science Direct on Line, PubMed, PsychINFO, Cochrane Clinical Trials Library, BVS and SciELO. The keywords used were: “cognitive behavioral therapy” (CBT); “therapy” and “treatment” in association to the terms “Internet addiction” and “video game addiction”, all with their Portuguese equivalents.

Inclusion criteria were: a) articles (original, review, letter to the editor) that associate CBT with Internet and video game addiction; b) explicit descriptors in the title or abstract; c) at least the summary should be in English, Spanish, French or Portuguese. In the absence of specific descriptors (Medical Subject Headings – MeSH), we chose to use terms close to the topics of interest. Considering the scarcity of studies, there was no restriction to the minimum period in the search of manuscripts, being accounted articles published until October 2013. Exclusion criteria were: a) articles without abstracts; b) studies of other psychopathologies; c) use of Internet and electronic games as a treatment model or learning.

Results

A total of 72 articles were found out of which 23 were used in this review. The flowchart shows this process, according to the model of the Preferred Reporting Items for Systematic Reviews and Meta-
Analyses (PRISMA)46 (Figure 1). A table was made using only the original studies (Table 1). To facilitate the comprehension of this new field of research and professional practice, categories were formed: a) CBT in reliance on Internet and video game addiction; b) Clinical cases; c) Treatment protocols; d) CBT combined with other intervention strategies. Thus, the results are shown below:

Figure 1. Flowchart detailing inclusion and exclusion selection criteria.

Table 1. Original studies of Internet and video game addictions (treatment)

<table>
<thead>
<tr>
<th>Authors (year)</th>
<th>Country which the study was conducted</th>
<th>Sample (n total)</th>
<th>Psychotherapeutic intervention</th>
<th>Disorder(s) in treatment(s)</th>
<th>Individual/group</th>
<th>Instruments utilized</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hall and Parsons (2001)57</td>
<td>United States</td>
<td>n = 1</td>
<td>CBT</td>
<td>Internet addiction</td>
<td>I</td>
<td>DSM-IV</td>
<td>N/I</td>
</tr>
<tr>
<td>King et al. (2012)68</td>
<td>Australia</td>
<td>n = 1</td>
<td>CBT</td>
<td>Internet and video game addiction</td>
<td>I</td>
<td>N/I</td>
<td>N/I</td>
</tr>
<tr>
<td>Tönnies et al. (2012)69</td>
<td>France</td>
<td>n = 1</td>
<td>CBT</td>
<td>Video game addiction</td>
<td>I</td>
<td>ELAS/IAT</td>
<td>LSAS = 23/144, IAT = 12/100</td>
</tr>
<tr>
<td>Lee (2011)58</td>
<td>United States</td>
<td>n = 1</td>
<td>CBT</td>
<td>Video game addiction</td>
<td>I</td>
<td>N/I</td>
<td>Patient quitted after the 5th session</td>
</tr>
<tr>
<td>Taquet and Hautekiette (2013)60</td>
<td>France</td>
<td>n = 1</td>
<td>CBT</td>
<td>Video game addiction</td>
<td>I</td>
<td>ELAS/BDI/PVP</td>
<td>LSAS = 20/144, BD = 0, PVP = 0/9</td>
</tr>
<tr>
<td>Young (2007)61</td>
<td>United States</td>
<td>n = 114</td>
<td>CBT</td>
<td>Internet addiction</td>
<td>I</td>
<td>CDQ</td>
<td>Good results 6 months after the end of the treatment</td>
</tr>
<tr>
<td>Ge et al. (2011)62</td>
<td>China</td>
<td>n = 86</td>
<td>CBT</td>
<td>Internet addiction</td>
<td>G</td>
<td>IAT/SCID</td>
<td>Lower latency at the end of the treatment</td>
</tr>
<tr>
<td>Jäger et al. (2012)63</td>
<td>Germany</td>
<td>n = 33</td>
<td>CBT</td>
<td>Internet and video game addictions</td>
<td>I/G</td>
<td>AICA</td>
<td>N/I</td>
</tr>
<tr>
<td>Zhu et al. (2009)64</td>
<td>China</td>
<td>n = 47</td>
<td>CBT / EA</td>
<td>Internet addiction</td>
<td>I</td>
<td>Group A (CBT) (Group B (CBT + MI))</td>
<td>IAD/SAS/SDDS/HAMA/SRSRS</td>
</tr>
<tr>
<td>Zhu et al. (2012)65</td>
<td>China</td>
<td>n = 112</td>
<td>CBT / CT / EA</td>
<td>Internet addiction</td>
<td>I</td>
<td>Group A (CBT) (Group B (CBT + MI))</td>
<td>IAD/SAS/SDDS/HAMA/SRSRS</td>
</tr>
<tr>
<td>Rooij et al. (2012)66</td>
<td>Holland</td>
<td>n = 12</td>
<td>CBT / MI</td>
<td>Internet Addiction</td>
<td>G</td>
<td>N/I</td>
<td>8 patients showed good results</td>
</tr>
<tr>
<td>Li and Dai (2009)67</td>
<td>China</td>
<td>n = 76</td>
<td>CBT</td>
<td>Internet addiction</td>
<td>G</td>
<td>Group A (CBT) (Group B (Control))</td>
<td>CIAS</td>
</tr>
<tr>
<td>Du et al. (2010)68</td>
<td>China</td>
<td>n = 56</td>
<td>CBT</td>
<td>Internet addiction</td>
<td>G</td>
<td>Group A (CBT) (Group B (Control))</td>
<td>IAT</td>
</tr>
</tbody>
</table>

Internet addiction

A study on Internet addiction found the most common changes (cognition, behavior, and emotion) of these users54. Cognitions: a) flow (the user believes that spent less time than actually spent); b) excessive concern (“If I do not get online, something bad will happen”); c) ruminations (“when I’ll be back online?”); d) denial (“I do not have a problem with the Internet”), and e) unrealistic expectations (“when I go online my life will be much better”). Behaviors: a) avoidance (when confronted with stressful situations, the Internet becomes an escape of everyday problems); b) impulsivity (difficulty in controlling the inappropriate behavior). Emotions: a) craving (urge to use the Internet); b) guilt (when the user realizes the damage of the inappropriate use). The authors mention strategies for these patients: a) the goal of the treatment should not be abstinence, but moderate use; b) psychoeducation; c) self-observation (understand escapism as a compensatory strategy, also recognizing the triggers); d) time management; e) development of offline activities, and f) prevent relapse.

a) CBT in reliance on Internet and video game addiction

Given the scarcity of studies, we chose studies that briefly mentioned CBT in the treatment of these dependencies. The results were: a) original study57; b) letter to the editors50; c) literature review51,52. An article in the late 1990’s referred to these disorders as a “computer addiction”53.

Instruments

IAT: Internet Addiction Test; LSAS: Liebowitz Social Anxiety Scale Test; IAD: Internet Addiction Disorder self-rating scale; SAS: anxiety self-rating scale; SDS: self-rating depressive scale; HAMD: Hamilton depression scale; HAMA: Hamilton anxiety scale; SRSRS: self-rating sub-health scale; CIAS: Chinese Internet Addiction Scale; OTIS: Ozark Time Intensity Survey; BASIS-32: Behavioural and Symptom Identification Scale; BDI: Beck Depression Inventory; CDQ: Client Outcome Questionnaire; PVP: Problem Video Game Playing; SCID: The Structured Clinical Interview for DSM-IV.

Treatment model

CBT: cognitive-behavioral therapy; CT: comprehensive therapy; EA: electroacupuncture; MI: motivational interview.

Other terms

1. individual; G: group; N/I: not informed.
Suggested techniques for Internet addiction are: a) to discover the patterns of Internet use and break them suggesting a new schedule, b) to use subjects (e.g. familiar) that may cause the user to stop using the Internet, c) to define goals, d) to refrain from a particular application, e) to use reminder cards, f) to develop a personal inventory, g) to join a support group and, finally, h) to articulate a family therapy.

Video game addiction

The dependent undertake the following strategies: a) monitoring: the client will be aware of the usage time as well as sleep time, neglect of daily activities and mood swings when not playing, b) setting goals: reducing usage time can vary based on the style of the game. In summary the scientific literature mentions more specific techniques to Internet addiction in comparison to video game addiction. Despite this information and although they are different disorders, we believe that these same techniques can be applied to these two possible disorders.

b) Clinical cases

Internet addiction

The following study revealed the case of Becky, 18 years old. At age of 15 she began to create web pages for her school. The following year her parents divorced and she started to isolate herself in her bedroom, participating in chats with other teens whose parents were divorced. Shortly thereafter she began to stop doing her homework, worsening her grades.

Automatic thoughts discussed were: a) “I think I’ll never reduce my time spent on the Internet”; b) “I think I will fail in my first semester in college”; The intermediate beliefs: a) “If I fail at school, I have also failed in life”; b) “If I ask for help, then you will know that I am weak”; Core beliefs: a) “I am inadequate”, b) “I am incompetent”. Rules: a) “I live to the extreme; therefore, life will be worth it.”

The treatment focused on the interaction of the events with her cognitive vulnerability (always been shy and believed to be difficult to initiate interactions with others), compensatory strategies (holds high expectations for herself, avoids asking for help, searches the Internet as escapism) and the development and maintenance of her Internet addiction. The authors did not reveal the outcome of the interventions, just pointing out that this model has proven effective in other cases of this disorder.

Internet and video game addictions

An article illustrated the case of John, 16 years old, Internet and video game addicted, who spent about 10 hours per day playing electronic games online and downloading movies, series and music. The teenager had difficulty in waking up to go to school and to attend family programs, and also left the college basketball team. He consumed caffeine in excess in order to keep him online; urinated in a plastic bottle to avoid going to the bathroom and, when not on the computer, used the Smartphone to browse the Internet.

The case conceptualization identified automatic thoughts related to getting online and situations that precipitated the use of the Internet. The article did not disclose John’s case, but presented the interventions: a) monitoring; b) recording of dysfunctional thoughts; c) setting an alarm to go off after 45 minutes on the Internet and use the other 15 minutes to do an activity out of the Internet; d) methodizing sleep time to use the internet during the day instead of the night; e) using of reminder cards that summarizes the treatment goals; f) performing distraction exercises.

Video game addiction

The first manuscript described the case of MA, 30 years old, single, student of Sociology. Since the age of 12 he suffers constant hu-
that the results of these treatments could be more satisfactory and the authors could publish, in a near future, the follow-up of these cases, which may strengthen if they have satisfactory outcomes and the importance of CBT in these two possible psychiatric disorders.

c) Treatment protocols

Internet addiction

A study investigated the efficacy of CBT\(^6\). One hundred and fourteen Internet addicts participated in the treatment. The protocol presented the following variables: patient motivation, administration of the time spent online, improvement in social relationships, engagement in activities outside the Internet and the ability to refrain from problematic applications. The results suggested that male subjects in high school have increased risk of Internet addiction. The treatment showed satisfactory aspects, such as the possibility of patients being able to manage their conflicts with the Internet by the end of the second month of therapy and maintain their therapeutic gains six months after the completion of the protocol.

The next study\(^3\), conducted in China, mentions that there are neurobiological factors related to cognitive deficits on Internet addicts. Thus, the use of the instrument P300 (auditory evoked potential) allows to identify changes in working memory as well as attention process in these patients. In these tests a low amplitude and long-latency are consistently observed in patients with substance dependence. The researchers conducted a study with 38 Internet addicts (32.5 ± 3.2 years) and 48 subjects in the control group (31.3 ± 10.5 years).

After the tests, the dependent group showed longer latency compared to the control group and showed similar amplitude. After three months of treatment with cognitive-behavioral psychotherapy, latency decreased significantly in the dependent group, revealing a decrease in the cognitive deficits described above.

The protocol lasted for three months with 24 sessions of 1 hour, twice a week. The treatment involved eight steps, including team building, the relationship between the ego (self) and use the Internet, training in interpersonal communication, members who achieved treatment success (success stories) training, career planning, college, self-management and construction of a system of self-restraint in which patients could help each other.

Internet and video game addictions

A cognitive-behavioral model combines individual and group interventions, with a duration of four months\(^6\). This treatment was called Short-Term Treatment of IA/CA (STICA). The IA and CA acronyms refer to the Internet Addiction and Computer Addiction (also called Video Game Addiction). A preliminary validation of the STICA was conducted with 33 patients. Of these, 24 completed the treatment and nine left prematurely (27%). The study was entitled “Treatment outcome of a manualized cognitive-behavior therapy in Internet and Computer game addiction”.

Thus, it was elaborated an updated protocol of STICA. The researchers established eight inclusion criteria: (1) to fulfill symptoms consistent with the disorders, which had been held in the last six months, for the Assessment of Internet and Computer game addiction (AICA); (2) score ≥ 7 in self-assessment for the AICA; (3) patients with comorbidities, since the Internet and video game addiction were primary diagnoses; (4) only men; (5) age between 17 and 45 years; (6) changes in medications or dosages will not be allowed in the last two months before the STICA or during treatment; (7) whether the patients used some psychotropic and ended the use of the drug, it should be without the action of another medicine for at least four weeks; (8) during the STICA no other psychotherapeutic model will be allowed and psychotherapies have made must have been completed for at least four weeks. Exclusion criteria were: patients with a score < 40 on the Global Assessment of Functioning Scale, or severe depression ≥ 29 on the Beck Depression Inventory (BDI), drug or alcohol, personality disorders and bipolar disorder.

The treatment was divided into 23 sessions of psychotherapy, with 15 of them in group with duration of 100 minutes each, and eight individually, with the standard time of 50 minutes. The treatment stages were:

- **Initial phase**: to educate the patient regarding the mechanisms and effects of Internet and video game addiction (theories of learning, development and consequences of addictions and the addition cycle).
- **Intermediate phase**: identification of dysfunctional triggers of the Internet use; functional analysis of addictive behavior; strategies of problem solving; construction of alternative activities; monitoring to reduce procrastination, promotion of social communication; training exposure; skills training and promotion of functional use of computers and the Internet.
- **Final phase and relapse prevention**: functional use of the Internet and electronic games and drafting tools in preventing relapse.

In summary, the first study\(^6\) showed that the treatment was satisfactory, but there were no measurement of the patients’ symptoms so we could not compare the results of the beginning and end of the treatment. The second manuscript\(^6\) also emphasized that the treatment was successful, but it has the same flaw of the previous article. The STICA\(^6\) protocol, even being consistent in its structure and purpose, also did not thoroughly investigate the treatment results.

d) CBT combined with other intervention strategies

Internet addiction

An article demonstrated the efficacy of electroacupuncture combined with CBT\(^6\). The 47 participants were divided into two groups: Group A underwent CBT and Group B underwent CBT and electroacupuncture. Ten sessions were performed in an interval of four days between them. The electro sessions were applied to the same interval, but in 20 sessions. The effectiveness of treatment in Group A was 59.1% (13/22) and group B consisted of 91.3% (21/23). The authors suggest that the use of electro-associated CBT was more effective than psychotherapy alone.

The second research\(^6\) had 112 participants that were divided into three groups: a) comprehensive therapy (n = 37), b) electroacupuncture (n = 39) and c) CBT (n = 36). The treatment lasted 40 days, with sessions every four days. The authors concluded that electroacupuncture combined with CBT may improve cognitive function in patients with Internet addiction. This mechanism may be related to the increased speed of brain discrimination and increased mobilization of resources during information processing in the brain.

The Lifestyle Training program aimed to treat Internet addiction\(^6\). Through a website, users who considered themselves as dependents were recruited. Exclusion criteria: under 18 years old and suicidal behaviors. The website presented a system based on Compulsive Internet Use Scale test (CIUS). Nearly 2000 subjects completed the test, however, only 12 were classified to carry out the treatment program (the others were excluded or had no interest).

The program, based on CBT and Motivational Interviewing focused on the following points: the motivations that could change, the choice of treatment goals, the gain of self-control, the relapse prevention and the coping skills training. The protocol consisted of 10 sessions of 45 minutes; seven of these sessions were performed in a 10-week period and the remaining three, if necessary, for a period of three months. The sessions had a fixed format: introduction, review of the current framework, discussion of the homework, explanation of the theme of the day, practice of the skills, reception of the homework and finally the closure of the session.

The researchers pointed out the main results: a) the monitoring of daily use of Internet revealed the amount of time spent online; b) patients were creative through exercises of self-control; c) the search for new habits linked to expanding friendships and reduced use of technologies; d) techniques in preventing relapse (such as the structuring of leisure time) were successful.

Treatment had satisfactory success. Out of the 12 subjects, three withdrew and/or changed the treatment. The remaining eight par-
Participants achieved notable changes. All who completed treatment decreased their usage time per day and the number of access during the week. Simultaneously, the same participants showed increased self-confidence.

Two other studies68,69 demonstrated that the addicted patients were split into two groups: a) control group and b) patients undergoing CBT; and similar results were found: those who underwent cognitive behavioral therapy showed better results at the end of treatment.

Video game addiction

No results were found.

In summary, two studies65 that used CBT with electroacupuncture showed that this treatment model is more effective when combined. A similar one based on CBT with Motivational Interviewing also showed good results66, 75% of the patients were successful. The last two manuscripts68,69 reinforced that the treatment was satisfactory. A major flaw of these works is that they not revealed statistical results of the treatments.

Discussion

It was pointed out the importance of evidence-based treatment options for Internet and video games addicts. These two phenomena have a remarkable opportunity to be considered new psychopathological manifestations. The literature review described manuscripts with heterogeneous results, especially due to the lack of psychotherapy treatments for Internet and video games addictions. Although studies haven’t shown the treatment outcomes or revealed withdrawal of the patient, other researchers showed psychotherapeutic success. We find that, to date, CBT is the most common treatment in technological addictions and we believe we have achieved an important result showing how recent is this phenomenon, especially combined with a psychotherapeutic model.

The main thoughts of these patients enable the therapist to recognize the most common cognitive distortions and how they can be re-purposed, encouraging clinical efficacy70. In addition, the manuscripts have shown the behaviors of avoidance and impulsiveness of this psychiatric group, suggesting modifiable strategies in psychotherapy71.

Abstinence is not the goal of the treatment, but adaptive use. Psycho-education, self-observation and development of offline activities appear to help the patients to reduce their time on the Internet and/or with video games. The case studies showed different results: two of them did not mention treatment follow-up, precluding the analysis on these data72,73; an article showed that the psychotherapeutic outcome was unsatisfactory due to consecutive patient dropouts74,75, two other articles have demonstrated the positive prognosis end of psychotherapy76,77. It is still early to assert if CBT will be the therapy of choice for these patients.

Regarding CBT protocols and associated treatments, a study presented the structure of the treatment but without patients’ results44. Other study mentioned success regarding psychotherapy with their patients, but no data revealed this statement45. Two studies have demonstrated the association of CBT with electroacupuncture, revealing that it is more effective when these two interventions are applied simultaneously46,47. Other studies showed successful treatment48,49. We believe that there are few protocols that can demonstrate depth the satisfactory outcome of CBT in greater depth. The omission of this information in several articles corroborated to encumber a better analysis in this article.

The present review showed limitations: a) although we only cited 23 articles (still a small number), we believe we have achieved an important result in showing how recent is this phenomenon; b) the use of different methods of selection of participants in each study prevents a more accurate analysis; c) some manuscripts showed no treatment outcomes; d) there was a variation in the number of participants; and e) most researches has shown results only in adolescents and young adults.

Conclusions

The psychological distress experienced by the addicted to technology is real and has been presented as a clinical demand, as it has losses to the quality of life. The present review has shown that we have encouraging results in treating these possible dependencies, based on CBT, which has been proved effective in combating various psychopathologies72.

The studies indicated which techniques are the most used in this model of treatment by exemplifying case studies, protocols or combined treatments. Even though not all manuscripts have explained the treatment outcome, we believe it is necessary to reveal how this model of intervention works, increasing this information to health professionals that treats this demand. We also recommend a review of the literature on the pharmacological aspect in the treatment of these addictions73.

Thirteen articles were shown on Table 1. Three of them showed no results of the treatment; one study demonstrated that the patient quit and nine manuscripts revealed good results. Some studies have demonstrated greater efficacy when psychotherapy was associated with electroacupuncture. Although there are fewer protocols when compared to the study of other psychopathologies, researches have shown satisfactory effectiveness, proving the same efficacy of CBT in the treatment of other psychopathologies related to impulse control disorder.

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