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Emotional Regulation and Video Game Addiction: Interfaces with Cognitive-Behavioral Interventions in the Brazilian Context

Regulação Emocional e Dependência de Videogame: Interfaces com Intervenções Cognitivo-Comportamentais no Contexto Brasileiro

Regulación Emocional y Adicción a Videojuegos: Interfaces con Intervenciones Cognitivo-Conductuales en el Contexto Brasileño

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Abstract

The increased use of video games has caused concern in the scientific community due to their effects on mental health. This study analyzed the relationship between video game addiction, impulsive behavior and emotional regulation, investigating the mediating role of the latter in the context of Cognitive Behavioral Therapies (CBT). The sample consisted of 232 participants, 52.6% of whom were male with a mean age of 22 years ($SD = 5.578$, $SE = 0.366$) who played video games between 2 and 4 times a week ($M = 3.47$, $SD = 1.386$, $SE = 0.091$). The results indicate negative and significant correlations between emotional regulation and video game addiction ($r = -0.388$, $p < 0.001$), as well as between emotional regulation and impulsive behavior ($r = -0.253$, $p < 0.001$). The ability to regulate is significantly associated with a decrease in video game addiction ($\beta = -0.482$, $p < 0.001$) and acted as a mediator of this relationship ($\lambda = 0.138$, 95% *CI* [0.051, 0.262], $p = 0.005$). The findings reinforce the effectiveness of CBT strategies, such as emotion regulation training, in managing video game addiction.

Keywords: Emotional Regulation, Internet Addiction Disorder, Cognitive Behavioral Therapy

Resumo

O aumento do uso de vídeo games tem gerado preocupação na comunidade científica devido aos seus efeitos na saúde mental. Este estudo analisou a relação entre dependência de vídeo game, comportamento impulsivo e regulação emocional, investigando o papel mediador desta última no contexto das Terapias Cognitivo-Comportamentais (TCC). A amostra foi composta por 232 participantes, sendo 52,6% do sexo masculino com média de idade de 22 anos ($DP = 5,578$; $EP = 0,366$) que jogavam entre 2 a 4 vezes por semana ($M = 3,47$; $DP = 1,386$; $EP = 0,091$). Os resultados indicam correlações negativas e significativas entre regulação emocional e dependência de vídeo game ($r = -0,388$, $p < 0,001$), bem como entre regulação emocional e comportamento impulsivo ($r = -0,253$, $p < 0,001$). A capacidade de regulação está significativamente associada à diminuição da dependência de vídeo game ($\beta = -0,482$, $p < 0,001$) e atuou como mediadora dessa relação ($\lambda = 0,138$, 95% *CI* [0,051, 0,262], $p = 0,005$). Os achados reforçam a eficácia de estratégias da TCC, como treinamento de regulação emocional, no manejo da dependência de vídeo game.

Palavras-chave: Regulação Emocional, Transtorno de Adição à Internet, Terapia Cognitivo-Comportamental

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Resumen

El creciente uso de videojuegos ha causado preocupación en la comunidad científica debido a sus efectos sobre la salud mental. Este estudio analizó la relación entre la adicción a los videojuegos, la conducta impulsiva y la regulación emocional, investigando el papel mediador de esta última en el contexto de las Terapias Cognitivo Conductuales (TCC). La muestra estuvo formada por 232 participantes, de los cuales 52,6% eran varones con una edad media de 22 años (*DE* = 5,578; *SE* = 0,366) que jugaban videojuegos entre 2 y 4 veces por semana (*M* = 3,47; *DE* = 1,386; *SE* = 0,091). Los resultados indican correlaciones negativas y significativas entre la regulación emocional y la adicción a los videojuegos (r = -0,388, $p < 0,001$), así como entre la regulación emocional y la conducta impulsiva (r = -0,253, $p <$ 0,001). La capacidad de regulación se asocia significativamente con una disminución de la adicción a los videojuegos (β = -0,482, $p < 0,001$) actuando como mediador de esta relación (λ = 0,138, *IC* 95% [0,051, 0,262], p = 0,005). Los hallazgos refuerzan la eficacia de las estrategias de TCC, como el entrenamiento en regulación emocional, en el manejo de la adicción a los videojuegos.

Palabras clave: Regulación Emocional, Trastorno de Adicción a Internet, Terapia Cognitivo-Conductual

Highlights of Clinical Impact

- This study highlights the significant associations between Internet Gaming Disorder (IGD), impulsive behavior, and emotion regulation.
- Emotion regulation mediates the relationship between impulsivity and IGD, reinforcing its role as a protective factor.
- Cognitive-Behavioral Therapy (CBT), Dialectical Behavior Therapy (DBT), and Acceptance and Commitment Therapy (ACT) emerge as effective interventions.
- Addressing emotional regulation in clinical practice may help mitigate impulsivity and reduce IGD symptoms.

Modern technology has played an increasingly significant role in contemporary society, facilitating connections, new forms of communication, and the continuous flow of information (Petrosyan, 2024). With approximately 5.44 billion people connected globally, internet use is a rapidly expanding phenomenon (Lozano-Blasco et al., 2022). Brazil, the fifth-largest country in terms of digital population, boasts around 177.01 million internet users, making it one of the world's leading digital markets (Bianchi, 2024).

Among the diverse uses of the internet, online gaming stands out as one of the most popular and enduring forms of entertainment worldwide, with approximately 2.6 billion players (Clement, 2024). However, the excessive use of online games has raised concerns within the scientific community due to its significant psychological impacts, especially the inability to control gaming habits due to deep immersion (Kim et al., 2022).

The latest version of the DSM 5-TR (American Psychological Association [APA], 2022) classifies Internet Gaming Disorder (IGD) as a recurrent and persistent pattern of internet gaming, characterized by symptoms such as progressive loss of control, reduced tolerance, and withdrawal. IGD is recognized as a global public health issue due to its detrimental effects on personal, academic, and professional life, often leading to school dropout, job loss, and marital problems (APA, 2022).

IGD is associated with several risk factors, including low self-control capacity, impulsivity, and difficulties in emotional regulation. Studies suggest that IGD prevalence is higher in men, though some research indicates that men and women are equally affected (Beranuy et al., 2020; Khrad et al., 2022; Warburton et al., 2022; Zhang et al., 2024). Factors such as age, weekly gaming hours, and related behaviors, such as constantly thinking about gaming, are robust predictors of this disorder (Shouman et al., 2023; Warburton et al., 2022).

The consequences of IGD are extensive, including reduced quality of life, symptoms of depression, stress, interpersonal difficulties, and difficulties in emotional regulation (Lozano-Blasco et al., 2022; Shouman et al., 2023). McRae and Gross (2020) describe emotional regulation as the attempt to influence one's emotions based on up and down regulation of positive and negative emotions according to regulation-related goals.

The effectiveness of emotion regulation strategies will depend on matters such as individual differences and contextual factors (McRae & Gross, 2020). Some studies have shown that difficulties in emotional regulation are significantly associated with compulsive behavior, which could reinforce the notion that video gaming addiction may serve as a dysfunctional coping mechanism for managing negative emotions (Lin et al., 2020; Pettorruso et al., 2020). Therefore, emotional regulation, which mediates the relationship between impulsivity and IGD, is crucial for understanding and intervening in this behavior (Hammad & AL-Shahrani, 2024; Warburton et al., 2022).

In this context, Cognitive-Behavioral Therapy (CBT) has emerged as the "gold standard" for treating technology-related addictive disorders, including IGD (Lopez-Fernandez et al., 2022).

CBT, described by Beck (2022) as an approach centered on restructuring dysfunctional thoughts, provides tools for modifying maladaptive thought and behavior patterns, resulting in significant mental health improvements. Beyond CBT, other derivative therapies, such as Dialectical Behavior Therapy (DBT) and Acceptance and Commitment Therapy (ACT), have proven effective in managing difficulties related to emotional regulation and impulse control (Hayes et al., 2021; Linehan, 2017).

Interventions based on these approaches include strategies such as mindfulness, cognitive restructuring, and emotional skills training. Recent studies have shown that these interventions significantly reduce IGD symptoms, highlighting their potential as promising alternatives for managing compulsive gaming behaviors (Schwebel et al., 2020; Siste et al., 2022). Considering these perspectives, the present study seeks to investigate the relationship between video gaming addiction, impulsive behavior, and emotional regulation, exploring the mediating role of emotional regulation in the interaction between impulsivity and IGD. Furthermore, it discusses the applicability of CBT, DBT, and ACT-based strategies in addressing this disorder, contributing to theoretical and practical advances in psychological assessment and therapeutic interventions.

METHOD

Participants

The sample included 232 participants with a mean age of 22 years (SD = 5.578, SE = 0.366). Of these, 52.6% identified as male and 47.4% identified as female. Moreover, 53% of the sample identified as Caucasians and 53% reported an annual income of $19,999 or less. On average, participants reported playing video games more than 3 times a week (M = 3.47, SD = 1.386, SE = 0.091). Recruitment was conducted through popular social media platforms, including WhatsApp, TikTok, Instagram, and email, to ensure a diverse and representative demographic sample.

Instruments

The study employed the following validated instruments to measure the relevant variables:

The Gaming Disorder Scale

This scale, based on the DSM-V-TR diagnostic criteria for internet gaming disorder (APA, 2022), assesses nine dimensions such as withdrawal, loss of control, unsuccessful attempts to reduce gaming, and deceiving others, to name a few. Despite being in the validation process, the scale demonstrated strong internal consistency, with a Cronbach's alpha of 0.934. The scale consists of nine items, including questions like, "During the last year, have you hidden the time you spend on games from others?" and "During the last year, have you felt unsatisfied because you wanted to play more?" Participants respond to the items using a scale of "0 = No", "1 = Sometimes", and "2 = Yes".

Emotion Regulation Questionnaire

The Emotion Regulation Questionnaire (Gross & John, 2003) is a 10-item questionnaire, including items such as "I keep my emotions to myself" and "I control my emotions by not expressing them," which assess individual differences in the use of two emotion regulation strategies: cognitive reappraisal and expressive suppression. It uses a 7-point Likert scale ranging from "1 = Strongly disagree" to "7 = Strongly agree." The scale demonstrated an adequate internal consistency, with a Cronbach's alpha of 0.738.

UPPS-P Impulsive Behavior Scale (short version)

The Short Version of the UPPS-P Impulsive Behavior Scale (Cyders et al., 2014) is a 20-item questionnaire that was used to assess impulsive behavior across five dimensions: Negative Urgency, (Lack of) Premeditation, (Lack of) Perseverance, Sensation Seeking, and Positive Urgency. It was measured on a 4-point Likert scale, ranging from "1 = Disagree Strongly" to "4 = Agree Strongly." The scale has demonstrated adequate internal consistency, with a Cronbach's alpha coefficient of 0.798.

Additionally, participants completed questionnaires that assessed their media habits, personality traits, thoughts, attention problems, and feelings. Demographic information, including gender, age, and media usage time, was also collected to provide a more detailed characterization of the participants.

Procedures

Data Collection

Data collection was conducted following approval by Centro de Ciências da Saúde da Universidade Federal da Paraíba (CCS/UFPB) (CAAE: 58015122.2.0000.5188), and ethical procedures were followed according to the resolutions 466/12 and 510/16 of the National Health Council, ensuring participant anonymity and consent. The questionnaires were made available digitally through the Google Forms platform and sent to participants via email and social media apps such as WhatsApp, Twitter, Facebook, and Telegram. Participation was voluntary, with valid responses from individuals who were at least 18 years old and completed the questionnaire.

Before answering the questionnaire, participants were invited to read and agree to the Informed Consent Form (ICF). Those who agreed to participate indicated their consent by selecting 'Yes' and then proceeded to the questionnaires. If they did not wish to participate, they could select 'No' and end their participation. The time required to complete the questionnaire was approximately 30 minutes.

Data Analysis

The data were analyzed using the statistical software IBM SPSS (Version 21) and JASP Team (2024). Descriptive statistics were calculated to detail the sample characteristics and key variables. Inferential analyses, including Pearson correlation,

regression, and mediation analyses, were conducted to explore relationships between variables and test potential predictive and mediating effects. The internal consistency of all scales was assessed using Cronbach's alpha to ensure reliability (Field, 2020). A Cronbach's alpha of 0.70 or higher was considered acceptable for all measures (Nunnally & Bernstein, 1994).

RESULTS

Correlational Analyses

Initially, we observed a positive and significant correlation between IGD and Impulsive Behavior (IMP). These results showed that the level of gaming addiction is positively related to the propensity for impulsive behavior ($p = 0.533$, $p < 0.001$), suggesting that individuals with more IGD symptoms tend to behave more impulsively.

Moreover, the correlations between IGD and ER were negatively and significantly associated ($r = - 0,338$, $p < 0.001$). This data indicates that individuals with gaming addiction tend to have lower emotion regulation abilities. Additionally, we identified negative and significant correlations between ER and IMP variables ($r = - 0.253$, $p < 0.001$). This relationship indicates that individuals with lower emotion regulation abilities also tend to behave more impulsively (see Table 1).

Regression Analysis

To assess the protective role of ER in relation to IGD, we conducted a regression analysis. The results indicated that emotion regulation abilities significantly mitigate the risk of developing video game addiction. To verify the protective effect of ER on IGD, we performed a regression analysis. The regression coefficient for emotion regulation was significant (β= - 0.482, $SE = 0.089$, $t = - 5.426$, $p < 0.001$). This finding suggests that individuals with greater emotion regulation abilities are less likely to exhibit symptoms of IGD.

Mediation Analysis

To verify the influence of ER on the relationship between IMP and IGD, we conducted a mediation analysis using the Bootstrap method with 1000 replications. The mediation analysis revealed significant mediating effects of emotion regulation on the relationship between IMP and IGD (indirect effect: β= 0.138, 95% *CI* [0.051, 0.262], $p = 0.005$) (see Figure 1).

Table 1. *Pearson Correlation Analyses Among Variables*

	1	2	3
1 IGD			
2 IMP	0,533***		
3 ER	-0,338***	-0,253***	

Notes: *$p < 0,05$, **$p < 0,01$, ***$p < 0,001$. Internet Game Addiction (IGD); Impulsive Behavior (IMP); Emotion Regulation (ER).

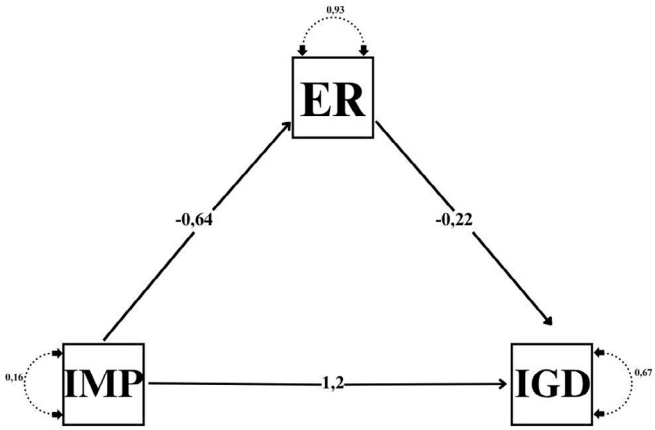

Figure 1. *Impulsive Behavior and Internet Gaming Disorder: The mediating role of Emotion Regulation*

Notes: Indirect effects from impulsive behavior (IMP) to internet gaming disorder (IGD) via emotion regulation (ER). 1000 bootstrap samples, ULS estimator. → = direct effects, → = indirect effects, p = 0.005.

These mediation results suggest that the relationship between impulsivity and Internet Gaming Disorder is mediated by emotion regulation. This indicates that higher levels of impulsivity and Internet Gaming Disorder are associated with a lower ability to regulate one's emotions. Individuals with lower emotional regulation abilities are more vulnerable to impulsive behavior and exhibit more symptoms of IGD. These results highlight the importance of addressing emotional regulation in interventions targeting video game addiction, as it serves as a protective factor capable of mitigating impulsivity's impact on gaming behavior.

DISCUSSION

The primary objective of this study was to investigate the relationship among video game addiction, impulsive behavior, and emotion regulation, as well as to explore the possible mediating role of emotion regulation in this relationship. Additionally, the study aimed to link these findings to therapeutic strategies derived from Cognitive-Behavioral Therapy (CBT), Dialectical Behavior Therapy (DBT) and Acceptance and Commitment (ACT). The results achieved the outlined objectives and offer significant contributions to both research and clinical practice, which are detailed below.

The results of this study suggest that players with great video game addiction are more likely to present greater impulsive behavior and lower emotional regulation. This result is in line with previous research, which claimed that self-regulation deficits, impulsivity and low self-control were strong predictors for IGD symptom severity scores (Warburton et al., 2022). It is also known that impulsivity traits and emotion dysregulation are commonly involved with this problematic behavior and can be a risk for the development of addiction (Lin et al., 2023; Pettorruso et al., 2020).

Additionally, the mediation effect by emotional regulation is in line with the current literature that also shows this relation with IGD and emotion regulation strategies, showing that individuals with this emotional regulation ability tend to be less addicted to online games (Yu & Xu, 2024) and emotion dysregulation positively predicts IGD (Lin et al., 2023). Since emotional regulation and impulsivity play important roles in the maintenance of IGD symptoms, interventions on this issue are required (Lin et al., 2020; Pettorruso et al., 2020). These results emphasize that interventions targeting emotional regulation can mitigate impulsive tendencies and reduce IGD symptoms, highlighting a promising avenue for therapeutic approaches.

Taking the above into account, it is known by literature that the core of internet-use related addiction problems involves addiction to games (Lopez-Fernandez et al., 2022). Regarding this matter, Han et al. (2020) showed that a CBT program for IGD treatment was more effective for reduction in the severity of IGD symptoms and impulsivity. The authors based their sessions on some strategies, such as stress management, psychoeducation on automatic thinking and cognitive distortion to find other ways of thinking, "five steps of change" focused on life values and goals, and the identification of behavioral patterns and emotional hurt. The participants reported a greater decrease in levels of impulsivity after going through the program. André et al. (2023) also contribute supporting CBT-based treatments for IGD by providing evidence that the participants who underwent treatment lowered their game addiction over time.

After conducting an early intervention with a group of adolescents, Szász-Janocha et al. (2020) showed a significant reduction in both self-reported and parental reported symptom severity after 12 months of treatment, enabling a long-term symptom reduction by using CBT-based interventions. The authors used cognitive behavioral techniques such as psychoeducation, cognitive restructuring, problem solving skills, behavior modification and emotional regulation. The goal of the program was that teenagers could achieve a more controlled use of internet and gaming activities, however, as an unexpected event, they were able to reduce the average consumption of the participants when compared to the national consumption. These findings suggest that CBT, particularly when applied early, can prevent the escalation of IGD symptoms.

André et al. (2022) shed additional insight with a sample of adults, concluding that they tend to respond better to treatment than younger people, showing a decrease of the criteria for gaming addiction by 100% after the treatment. This study used relapse prevention, a CBT-based form of treatment, adapted to fit the participants' primary problem behavior, in this case, either gaming or gambling, with the participants being able to regulate their gaming more healthily at the end of treatment.

ACT has a statistically significant effect on reducing severity of IGD (Moghaddas et al., 2023) since it provides interventions such as the combined use of mindfulness with commitment and behavior change (Lopez-Fernandez et al., 2022). Mindfulness is also encouraged to be combined with CBT for better results in addressing gaming behaviors (Kim et al., 2022), since it involves exploring how a specific stream of thoughts functions for a patient to promote new forms of psychological flexibility (Lopez-Fernandez et al., 2022). It also helps individuals to cope with their problems without resorting to gaming. Mind wandering can lead to spontaneous thoughts with negative emotional reactivity, thereby, Acting with Awareness could assist with prevention (Chiorri et al., 2023). By helping individuals identify automatic thought patterns and develop alternative, adaptive responses, ACT interventions equip individuals with tools to reduce reliance on gaming as an emotional escape.

While making behavior changes, it is important to stimulate activities outside the online environment, integrate the family's support and find the protective factors of every client (Lopez-Fernandez et al., 2022). Values are one of the classic protective factors when personalized, because they will help determine the behavioral commitments necessary to approach those goals (Moghaddas et al., 2023). Moreover, several studies take notable considerations regarding the family environment and the importance of integration between family members to help the one suffering from IGD, focusing on changes concerning parents' behaviours such as connection between parent-child and quality activities englobing the whole family (Kim et al., 2022; Warburton et al., 2022; Yu & Xu, 2024; Zhang et al., 2024).

The DBT treatment was also adapted for problematic media use, including problematic game behavior, with the primary goal being the domain of mindfulness, distress tolerance, emotional regulation, interpersonal effectiveness and dialectics (Pluhar et al., 2020). The authors also prioritized psychoeducation about exhibited behaviors, the impact of problematic media use on psychological and physical health, and the role of skills training. By building skills that helped reduce the underlying issues of dysregulated media use, the results showed a 50% decrease of problematic media use behaviors in response to the adapted DBT intervention. Siste et al. (2022) also conducted group intervention based on the aforementioned skills and were able to improve the participants' symptoms, proving that DBT is an effective modality for addictive disorders.

CONCLUSION

When living in a society that increasingly values the use of modern technology, it is of fundamental importance that the scientific community turns its attention to understanding the topic. Therefore, this study achieved the objectives of verifying the relationship between video game addiction, impulsive behavior and emotional regulation, as well as to explore the possible mediating factor of emotional regulation in this relationship, linked to strategies from CBT, DBT and ACT.

Our findings reinforce data from previous studies while supporting the correlational relationships between the variables

studied and the mediation effect by emotional regulation but also provide important insights about how different therapy approaches can contribute to this alarming matter that continues to grow everyday. There were no articles in the current literature that articulated the different cognitive therapy theories and these variables together with a sample of Brazilian adults, showing the relevance and scientific impact of the present study. Taking this into consideration, there is an increasing need for clinical psychologists to take ownership of the issue and seek appropriate interventions to manage these developments.

The current study was not bereft from its limitations. It is important to mention the difficulty in obtaining responses from a larger number of participants, considering that filling in the form required time and thought. However, this limitation was expected due to the use of a self-report questionnaire. Some compromising factors involved participants' reactivity to the form, with reports of fatigue and boredom during the fill-out of the questionnaire, which reduced the necessary engagement. Despite this, the integrity of the study remained intact, as the results are in line with the evidence available in the literature on the subject.

Future studies would benefit from research focusing on DBT strategies such as skills training since there is an existing gap in the current literature on the subject. Many authors have sought to promote cognitive change and mindfulness, which are fundamental steps in any program as previously discussed, but there could be more emphasis on providing interventions based on skills training, especially the ones that could reinforce abilities such as impulse control and emotional regulation.

In conclusion, clinical psychologists are encouraged to adopt evidence-based approaches that target emotional regulation and impulsivity to manage IGD effectively. By integrating therapeutic frameworks such as CBT, ACT, and DBT, practitioners can provide individuals with the tools to regain control over video gaming behaviors, fostering healthier relationships with technology and promoting overall psychological well-being.

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