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A SYSTEMATIC REVIEW OF COGNITIVE BEHAVIORAL THERAPY (CBT) FOR INTERNET GAMING DISORDER (IGD)

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Article Info	ABSTRACT
<p>Article history: Received: 22 Sept 2024 Revised: 4 Oct 2024 Accepted: 20 Oct 2024 Published: 1 Nov 2024</p>	<p>The steadily increased number of individuals engaged excessively in gaming has raised public concern. Internet Classification Disease 11th revision had included gaming disorder as an official diagnosis. The continuous grow of the number of individuals suffering from internet gaming disorder highlighted the importance of interventions in managing internet gaming disorder. Psychotherapies, pharmacotherapies, and combined therapies were among interventions that were proven to be effective in assisting individuals with internet gaming disorders. Cognitive behavioral therapy is among the interventions that have proven to be effective in managing internet gaming disorders. Therefore, this systematic literature review, conducted using the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework with the aims to evaluate the effectiveness of Cognitive Behavioral Therapy intervention in addressing Internet Gaming Disorder. A comprehensive search was conducted across two major databases, Scopus, and Web of Science. Studies were selected based on predefined inclusion criteria, focusing on Cognitive Behavioral Therapy interventions for Internet Gaming Disorders. A total of 60 studies were screened, of which 11 met the inclusion criteria and were analyzed. The review highlighted three main areas: 1. To examine the effectiveness of cognitive behavioral therapy (CBT) intervention in reducing the symptoms of Internet gaming disorder; 2. To assess the adaptability of Cognitive Behavior Therapy across various cultural contexts and delivery methods, such as mobile applications in reducing Internet gaming disorder symptoms in various populations; 3. To evaluate the long-term impact and preventive potential of cognitive behavioral therapy-based interventions in reducing the development and recurrence of Internet gaming disorders. The research findings are consistent, whereby cognitive behavioral therapy interventions whether standalone intervention or combined with other approach showed a significant reduction of internet gaming disorder symptoms in mental health, assisting in identifying cognitive distortion and maladaptive behaviors. In conclusion, Cognitive Behavioral Therapy is a flexible, highly adaptable, reliable, and effective intervention for internet gaming disorders. The flexibility and adaptability of this approach enables it to be tailored to everyone that has different psychological profiles, personalities, different gaming habits and motivation levels.</p>
<p>Keywords: Cognitive Behavioral Therapy Gaming Addiction Gaming Disorder Internet Gaming Disorder Intervention Treatment</p> <p> OPEN ACCESS</p>	

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INTRODUCTION

Digital entertainment games have become one of the most popular leisure activities, as engaging in Internet gaming is often viewed as a form of entertainment and enjoyment (Boyle et al., 2012). When an individual immerses himself in playing games, it helps divert their attention from stress, allowing them to escape from reality. On the other hand, gaming activities function as a social platform, especially because they engage in multiplayer games that require teamwork and communication. To others, multiplayer games serve as companion tools, where they pass time by engaging in Internet gaming. According to Griffiths (2000), an individual is at risk of developing gaming addiction if internet or computer gaming is used as a form of leisure activity.

Although engaging in gaming activities is beneficial, it also raises concerns when an individual is excessively engaging in gaming activities. Over the past few years, the number of people engaging excessively in gaming activities has increased and become a mental health concern (Gorowska et al., 2022). It is reported that, globally, an individual spend an averagely of 8.9 hours gaming per week, and China and the United States are the leading countries that spend the most hours in gaming activities, with both countries spending an extra two hours more than the global statistic (Singh, 2023). According to research, Asian country region has reported engaged more time in gaming compared to other country on average each week whereby China spend 11.3 hours in gaming, Singapore spend average of 9.8 hours, Hong Kong spend average of 9.7 hours followed by Indonesia 8.7 hours. (Bhawna Singh, 2023). The increasing number of individuals engaged excessively in gaming has raised public concerns. In 2013, Internet gaming disorder was included in the Diagnostic and Statistical Manual of Mental Disorders: Fifth Edition (DSM-5) as a diagnosis that is significant for further research (American Psychiatric Association 2013). However, in 2018, the International Classification of Diseases 11th Revision included gaming disorder as an official diagnosis to highlight the continuous growth of excessive engagement in gaming which has a negative impact on people's mental health and general well-being (World Health Organization, 2018).

Internet gaming disorder often leads to negative consequences, such as poor academic performance and low self-esteem (Toker & Baturay, 2016); increased physical aggression if continuously exposed to violent content of gaming (Lemmens et al., 2011); depression (Tortolero et al., 2014); and musculoskeletal injury on the shoulder, hand, neck, and lower back (Fathuldeen et al., 2023). Numerous studies have revealed the seriousness of the negative outcomes of gaming addiction, and effective interventions are crucial for reducing the negative consequences of Internet gaming disorder. Various interventions have been implemented to manage Internet gaming disorders. Previous research indicated that psychotherapies, pharmacotherapies, and combined therapies were among the interventions proven to be effective in assisting individuals with Internet gaming disorder accompanied by other mental disorders (X. Wang et al., 2023). Cognitive behavioral therapy (CBT) is an intervention that has proven effective in managing internet gaming disorders. According to X. Wang et al., (2023), Cognitive behavioral therapy surpassed psychotherapy approach as other psychotherapy approach not extensively studied.

LITERATURE REVIEW

The literature review included CBT intervention of cognitive behavior therapy and a combination of cognitive behavioral therapy and other approaches in managing Internet gaming disorder.

COGNITIVE BEHAVIORAL THERAPY

Cognitive behavioral therapy has become one of the most popular interventions for Internet gaming disorders. Cognitive behavioral therapy is a structured, goal-oriented, and instructive approach (Chad et al., 2024). Numerous studies have proven that cognitive behavioral therapy is an effective intervention for Internet gaming

disorders (Wölfling & Dominick, 2022). Cognitive behavioral therapy has been proven to be effective in improving one's quality of life and enhancing daily functioning, as these approaches focus on i. identifying the distortion of thinking patterns which leads to psychological issues and learning to recognize and reevaluate thinking patterns; ii. Some of our psychological issues are from our own maladaptive behavioral habits, and it is important to be aware of these unhelpful behaviors and break the cycle of these behaviors. Individuals who suffer from psychological issues can learn effective coping mechanisms and apply problem-solving techniques to face challenges (American Psychiatric Association 2017).

COMBINATION OF COGNITIVE BEHAVIORAL THERAPY AND OTHER APPROACH

Several studies have been conducted to further investigate the effectiveness of cognitive behavioral therapy combined with different interventions in managing individuals with Internet gaming disorders. Among these studies are technology-based cognitive behavioral interventions which apply web-based platforms and mobile apps to deliver the intervention (Gorowska et al., 2022), the combination of physical exercise intervention with cognitive behavioral therapy (Hong et al., 2020), Cue-Reactivity Behavioral Intervention which consists of mindfulness and cognitive behavioral therapy (Z.-L. Wang et al., 2022), Pharmacotherapy combined with Cognitive behavioral therapy (X. Wang et al., 2023).

Intervention that comprises a technology platform and mobile apps based platform has several advantages compared to non-technology-based approaches, as the technology-based approach has the advantage of presenting the intervention content in a more attractive way with audio-visual content (Gorowska et al., 2022). In addition, the design of software or apps based on the targeted audience enhances the interactive level and increases the accessibility of interventions for Internet gaming disorders (Gorowska et al., 2022).

A study conducted by Hong et al. (2020) that applied physical exercise intervention combined with cognitive behavioral therapy as part of the intervention for the management of Internet gaming disorder revealed that the combination of these two approaches improves left prefrontal activation, reduces the intensity of Internet use, and reduces the severity of depressive symptoms among adolescents during the intervention period.

Next, a study was conducted using (Z.-L. Wang et al., 2022) on Cue-reactivity Behavioral Intervention with Cognitive behavioral therapy reviewed that by exposing individual who suffered from internet gaming disorder to gaming stimuli in a controlled context followed by cognitive behavioral approach to regulate their response is effective in reducing internet gaming disorder symptoms and improve treatment outcomes. The combined intervention consisted of six weeks of craving behavioral intervention which consisted of mindfulness and cognitive behavioral therapy techniques (Z.-L. Wang et al., 2022). The study found that the middle frontal gyrus cerebellum and precuneus are important brain regions associated with motor execution, self-regulation, and craving (Z.-L. Wang et al., 2022).

On the other hand, the combination of pharmacotherapies and psychotherapies led to a greater impact on the treatment of Internet gaming disorder compared to the two interventions performed separately, as the combination of both therapies is more comprehensive, as the combined intervention addressed biological and psycho-behavioral factors as part of treatment coverage (X. Wang et al., 2023).

OBJECTIVE

This study aims to:

1. To examine the effectiveness of cognitive behavioral therapy (CBT) intervention in reducing the symptoms of Internet gaming disorder.
2. To assess the adaptability of Cognitive Behavior Therapy across various cultural contexts and delivery methods, such as mobile applications in reducing Internet gaming disorder symptoms in various populations.
3. To evaluate the long-term impact and preventive potential of cognitive behavioral therapy-based interventions in reducing the development and recurrence of Internet gaming disorders.

METHODOLOGY

The Systematic Literature Review approach was implemented using the PRISMA Framework (Preferred Reporting Items for Systematic Reviews and Meta-analyses). The PRISMA Framework consists of four phases: i. Identification, ii. Screening and iii. Eligibility iv. Included. This was followed by data abstraction and analysis with the aim of systematic reviews of articles with comprehensive reporting to reduce potential sources of bias.

IDENTIFICATION

The Identification phase involves identifying keywords, synonyms of keywords, similar terms with the aid of thesauri, and previous academic research. Subsequently, all related terms that have been identified will be applied to the search strings in the Scopus and Web of Science databases, as illustrated in Table 1. to identify the relevant studies. This process aimed to meticulously identify potential articles that fulfilled the inclusion criteria of the review. A total of 186 academic articles were found in the Scopus and Web of Science (WoS) databases.

Table 1: Search String

Database	Search String
Scopus	TITLE-ABS-KEY (("cognitive behavioral therapy" OR "cognitive behavior therapy" OR "cognitive therapy" OR "behavioral therapy" OR "CBT" OR "psychotherapy" OR "cognitive restructuring" OR "behavior modification" OR "behavioral intervention") AND ("intervention" OR "treatment" OR "therapy" OR "program" OR "counseling" OR "prevention" OR "rehabilitation" OR "support" OR "management") AND ("gaming addiction" OR "video game addiction" OR "online gaming disorder" OR "digital gaming addiction" OR "problematic gaming" OR "gaming disorder" OR "excessive gaming" OR "compulsive gaming" OR "problem video gaming") AND ("adolescent" OR "teenager" OR "youth" OR "young person" OR "juvenile" OR "high school student" OR "teen" OR "young adult" OR "pubescent"))
WoS	("cognitive behavioral therapy" OR "cognitive behavior therapy" OR "cognitive therapy" OR "behavioral therapy" OR "CBT" OR "psychotherapy" OR "cognitive restructuring" OR "behavior modification" OR "behavioral intervention") AND ("intervention" OR "treatment" OR "therapy" OR "program" OR "counseling" OR "prevention" OR "rehabilitation" OR "support" OR "management") AND ("gaming addiction" OR "video game addiction" OR "online gaming disorder" OR "digital gaming addiction" OR "problematic gaming" OR "gaming disorder" OR "excessive gaming" OR "compulsive gaming" OR "problem video gaming") AND ("adolescent" OR "teenager" OR "youth" OR "young person" OR "juvenile" OR "high school student" OR "teen" OR "young adult" OR "pubescent") (Topic)

SCREENING

Duplicate studies were removed during the second phase. 15 duplicate articles were excluded from analysis. Next, researchers will meticulously screen titles and abstracts to eliminate papers that do not fulfil the inclusion criteria. A total of 75 articles were evaluated based on the inclusion and exclusion criteria determined by the researchers. Articles that did not meet the inclusion criteria were also excluded. These included the removal of reviews, systematic review meta-analyses, meta-syntheses, books, book chapters, and conference proceedings. Next, the selection of articles was limited to a five-year period of publication from 2020 to 2024 and to English-language publications only. Based on these criteria, 111 publications were excluded during the screening phase. Articles that fulfilled the review's inclusion criteria were considered for the next stage.

ELIGIBILITY

In the eligibility phase, a total of 60 articles were obtained. Researchers meticulously assessed the titles and contents of all articles to ensure that they fulfilled the inclusion criteria and were relevant to the research objectives. Therefore, a total of 49 articles were excluded because the articles did not fulfil the criteria due to abstract unrelated to abstract not related on the objective of the study, no mention of cognitive and behavioral dimensions, publication in the form of systematic reviews, reviews, meta-analyses, and out-of-field reports. The eligibility phase is essential to ensure the selected articles are relevant, precise, and high-quality data for further analysis. Hence, 11 articles were obtained for review, as shown in Table 2.

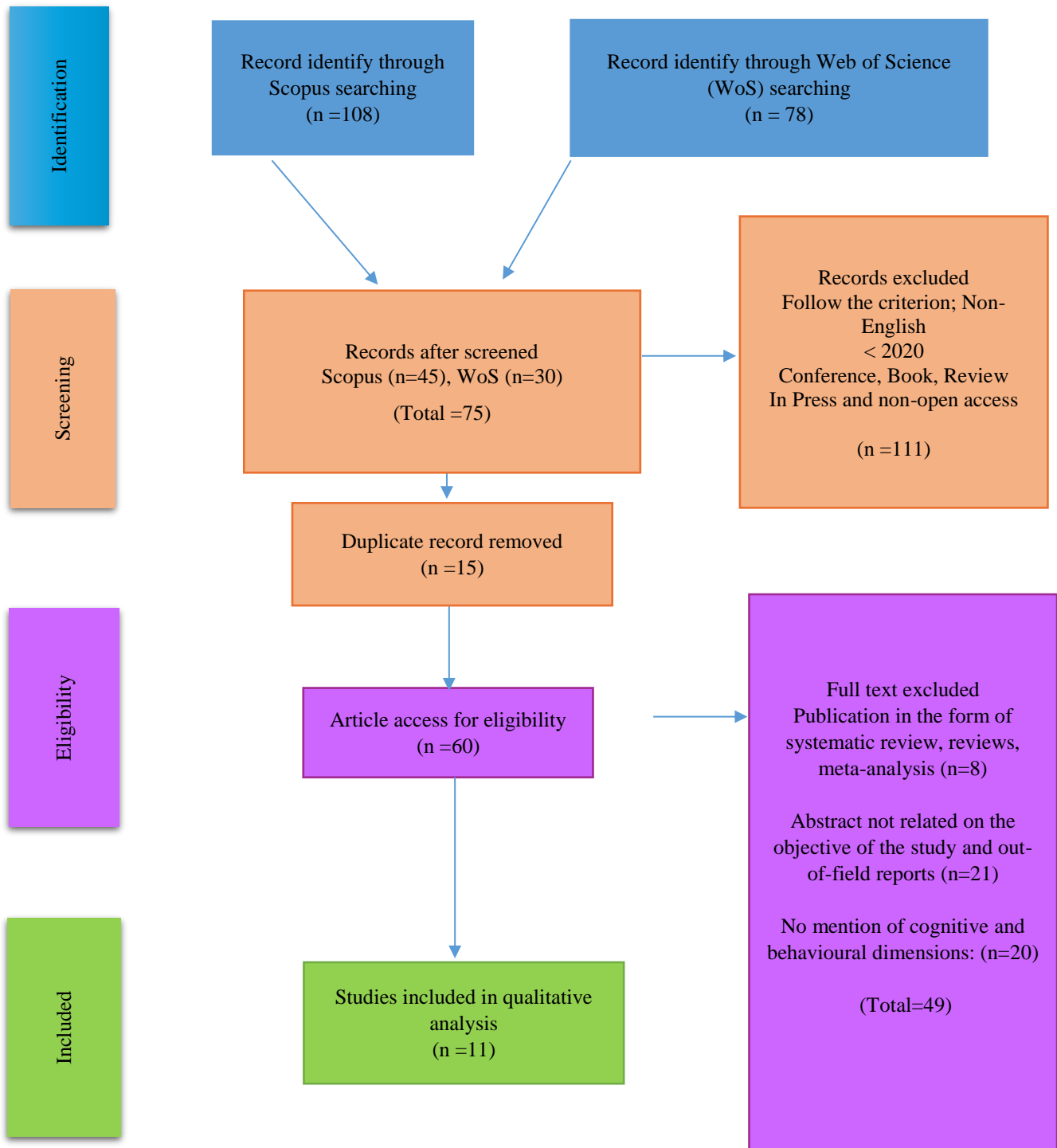
Table 2: The selection criterion of searching

Criterion	Inclusion	Exclusion
Language	English	Non-English
Timeline	2020-2024	< 2020
Literature type	Journal (Article)	Book chapters, Book Series, Review, Conference Proceedings
Publication Stage	Final	In Press

DATA ABSTRACTION AND ANALYSIS

A comprehensive analysis was conducted on 11 articles to obtain and extract relevant information on the study topic. In this study, with the collaboration of other authors, researchers were able to identify three themes: 1.To examine the effectiveness of cognitive behavioral therapy (CBT) intervention in reducing the symptoms of Internet gaming disorder: 2.To assess the adaptability of Cognitive Behavior Therapy across various cultural contexts and delivery methods, such as mobile applications in reducing Internet gaming disorder symptoms in various populations; 3.To evaluate the long-term impact and preventive potential of cognitive behavioral therapy-based interventions in reducing the development and recurrence of Internet gaming disorders. Table 3,4 &5 show the findings of every article that was selected and categorized into these three themes. A further discussion was held among other researchers to ensure that any discrepancies highlighted during the theme development process align with the theme that has developed. To ensure domain validity, the relevance of all sub-themes, and the significance of the articles, the analysis was reviewed by counselling and psychology experts. The feedback, comments, and evaluation by experts assisted in improving the validity and reliability of the study. Figure 1 illustrates the process implemented under the PRISMA Framework.

Figure 1. Adapted from Moher et al. (2009).



RESEARCH FINDINGS AND DISCUSSIONS

Three themes were identified based on the articles discussed.

- i. Cognitive Behavior Therapy (CBT) as an Effective Intervention for Internet Gaming Disorder
- ii. Cross-Cultural and Mobile-Based CBT Interventions for Internet Gaming Disorder (IGD)
- iii. Long-Term and Preventive CBT Interventions for Internet Use and Gaming Disorders

Cognitive Behavior Therapy (CBT) as an Effective Intervention for Internet Gaming Disorder

Numerous studies have shown that cognitive behavioral therapy (CBT) is an effective and successful intervention for treating internet gaming disorder (IGD). Several case studies and clinical trials have revealed that cognitive behavioral therapy plays a key role in improving the social functioning and mental health of individuals with Internet Gaming Disorder. Niedermoser et al. (2021) presented a typical case of a 19-year-old male who suffered from Internet gaming disorder and experienced social isolation, personal relationships, severe depression, and insomnia. An eight-month CBT session was implemented, focusing on psychoeducation, cognitive restructuring, and mindfulness. Through the intervention process, the patient showed reduced time engaged in gaming activities, improved sleep quality and social relationships, and no sign of depression (Niedermoser et al., 2021). However, Sravanthi et al. (2024) applied cognitive behavioral therapy combined with bupropion medication to manage patients with Internet gaming disorder. A 13-year-old male patient was diagnosed with Internet Gaming Disorder which had a negative impact on his social interaction and academic performance. Through combined pharmacological and cognitive behavioral intervention, the patient showed a significant improvement in his social functioning and gaming habits (Sravanthi et al., 2024). Integrating pharmaceutical and cognitive behavioral therapy is an effective intervention for managing multifaceted challenges associated with Internet gaming disorders (Sravanthi et al., 2024). In addition to the combination of pharmacological and cognitive behavioral interventions, Ji and Wong (2023) reported that a group-based intervention that included cognitive-behavioral therapy and motivational approach on adolescents

who suffer from problematic gaming was effective in reducing the symptoms of gaming disorder and the duration of gaming activity. The integration of cognitive behavioral therapy with motivational approach interventions has been proven to improve anxiety and depression symptoms in adolescents with gaming disorders. Addressing cognitive distortion and maladaptive gaming motivation is an important element that leads to the reduction of gaming disorder symptoms (Ji & Wong, 2023).

Overall, the findings from these studies highlight that cognitive behavioral therapy is effective in managing individuals with Internet gaming disorders. In addition, integration of pharmacological treatment, or combination with motivation approach along with cognitive behavioral therapy, consistently yielded the result of successful intervention in reducing gaming behaviors and improving the psychological well-being of individuals who suffer from Internet gaming disorder. The integrated approach serves as a complete and comprehensive alternative for managing Internet gaming disorder.

Cross-Cultural and Mobile-Based CBT Interventions for Internet Gaming Disorder (IGD)

Previous research has shown that Cognitive Behavioral Therapy is applicable to various cultural contexts. However, the inclusion of technology as part of daily trends further enhances the innovative approach by implementing mobile-based cognitive behavioral therapy. A study was conducted to explore the effectiveness of the Acceptance and Cognitive Restructuring Intervention Program (ACRIP) in assisting Asian adolescents in reducing Internet gaming disorders. Cognitive behavioral theories, cognitive restructuring, and the mindfulness approach were used as part of the fundamentals of ACRIP. According to Kochuchakkalackal Kuriala & Reyes (2023), CBT was used as part of the intervention to assist adolescents in restructuring their cognitive thinking processes toward gaming behaviors. One's gaming behavior will change significantly when one acknowledges one's cognitive distortion and is aware of the underlying cause of their gaming addiction behavior followed by the CBT approach to eliminate negative thought patterns of gaming behaviors. Kochuchakkalackal Kuriala and Reyes (2023) highlighted the significance of the CBT approach in diverse cultural contexts and demonstrated its universal applicability in various cultural contexts.

Cognitive behavioral therapy (CBT) has been widely applied worldwide as part of an intervention for Internet gaming disorders. Sharma et al. (2022) conducted a study (Sharma et al., 2022) in India that included the application of the cognitive behavioral therapy approach with multimodal psychotherapy as part of an intervention for individuals with Internet gaming disorder. A total of ten weekly sessions incorporated cognitive behavioral therapy, motivational enhancement techniques, behavioral strategies, and relapse prevention strategies as part of the intervention strategy, namely the multimodal psychotherapy program in the management of Internet gaming disorder (Sharma et al., 2022). The multimodal psychotherapy program showed a positive outcome in helping individuals who suffered from Internet gaming disorder, where it showed a significant improvement in Internet gaming disorder symptoms and improvement in individuals' physical and psychological health (Sharma et al., 2022). The combination of Cognitive behavioral therapy and mobile app-based education intervention is another creative approach for managing individuals with Internet gaming disorders. A study was conducted by (Pakpour et al., 2022) that integrate the application of technology by developed an app called "HAPPYTEEN" to enhance the accessibility of mental health practitioners. A transtheoretical model has been used to develop an app-based intervention combined with the cognitive-behavioral therapy principle that focuses on increasing adolescents' awareness of their gaming habits, emotions, thoughts, and facilitates behavioral change (Pakpour et al., 2022). A total of eight sessions were conducted to assist adolescents in identifying and modifying their gaming behavior, highlighting that mental health concerns such as depression and anxiety followed by enhancing their sleep hygiene showed a significant improvement in gaming disorder symptoms through the use of apps, especially toward the digitally savvy group among adolescents (Pakpour et al., 2022). Next, a pilot study of a CBT-based treatment manual named as "GOT-TO-GO" was conducted on adults with Internet gaming disorder in Sweden and found that there was a significant decrease in gaming disorder symptoms, improving emotions, especially anxiety and depression (Hofstedt et al., 2023). There are generally three phases in GOT-TO-GO treatment for Internet gaming disorder: phase 1: initial phase that focuses on the aims of treatment and strengthening one's commitment to change; phase 2: new skill phase which focuses on learning a new strategy to control one's engagement in gaming activities and spend more time in other activities besides gaming; and phase 3, known as relapse prevention which targets maintaining and prolonging the change during the treatment process and what measures to be taken if relapse occurs (Hofstedt et al., 2023). Hofstedt et al. (2023) highlighted the application of Cognitive Behavioral Therapy as an effective intervention for Internet

gaming disorder, especially for long-term behavioral changes when the treatment plan was structured and consistent.

In conclusion, previous studies showed that there is consistency in the effectiveness of cognitive behavioral therapy intervention in Internet gaming disorder, whether it is applied through a cross-cultural context, delivered through the mobile apps-based platform, or combined with multimodal psychotherapy. Previous Cognitive behavioral therapy interventions for Internet gaming disorder have proven varsity and adaptability in various contexts.

Long-Term and Preventive CBT Interventions for Internet Use and Gaming Disorders

A substantial number of cognitive behavioral therapy studies revealed the efficacy of cognitive behavioral therapy in treating Internet gaming disorder, but also proved its role in preventing the development of gaming addiction as well as assisting in the reduction of Internet gaming disorder symptoms in the long term. A Cognitive behavioral therapy -based preventive intervention known as “PROTECT” were conducted among adolescents who are at risk of developing internet gaming disorder and unspecified internet use disorder by detecting the early signs of addictive behaviors (Lindenberg et al., 2022). The prevention intervention strategy focuses on the early detection of addictive behaviors among adolescents and has been proven to successfully reduce the severity of Internet Gaming Disorder over a year; however, these approaches have limitations, as this approach is unable to fully prevent the emergence of Internet gaming disorder in all cases (Lindenberg et al., 2022). However, cognitive behavioral therapy-based preventive interventions have been proven to reduce the severity of Internet gaming disorder symptoms. Furthermore, according to André et al. (2023), relapse prevention is vital and is a significant treatment for Internet gaming disorders. The foundation of the relapse prevention approach is Cognitive Behavior. A study that implemented relapse prevention showed a reduction in the symptoms of Internet gaming disorders (André et al. 2023). The relapse prevention approach focuses on helping individuals who suffer from Internet gaming disorder identify the triggers and develop strategies to prevent and reduce the relapse of maladaptive gaming behaviors, helping individuals to sustain, maintain, and prolong the desired positive effects systematically (André et al., 2023).

Kapetanovic et al. (2023) further explored the application of a relapse prevention approach in a randomized control trial protocol. The social context role, family dynamics, and the relationship among family members are among the important elements for long-term symptom management in adolescents with Internet Gaming Disorder (Kapetanovic et al., 2023).

A study of brief manualized Cognitive Behavior Therapy interventions that aimed to address both gaming and non-gaming pathological Internet use revealed long-term improvements in adolescents with Internet use disorder and gained positive feedback from parents where they perceived an improvement in their children’s mental well-being after attending the intervention(Szász-Janocha et al., 2021). In addition, it has been reported that there are significant improvements in self-reported school anxiety, performance anxiety, social anxiety, and depression (Szász-Janocha et al., 2021). A brief manualized cognitive behavior therapy intervention is a short, focused therapy that only takes four sessions to achieve a long effect that is sustained over a 12 month period of time (Szász-Janocha et al., 2021).

In conclusion, the findings from previous studies have proven the effectiveness of cognitive behavioral therapy in reducing the symptoms of Internet gaming disorder, minimizing relapse, and managing comorbid psychological disorders, such as anxiety and depression. The inclusion of Cognitive Behavioral Therapy with other therapeutic approaches provides a holistic and comprehensive intervention for Internet gaming disorders (Sharma et al., 2022).

Table 3: Overview of cognitive behavior therapy (CBT) as an Effective Intervention for Internet Gaming Disorder.

CBT has consistently emerged as an effective intervention for IGD, particularly when combined with other treatments, such as medication. The articles on this theme demonstrate how CBT helps individuals change their maladaptive thought patterns and behaviors associated with excessive gaming.

Author (Year)	Title	Finding
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Sravanthi, Kasireddy; Nihal, N. G.; Raju, N. N.; Mane, Shailaja (2024)	A Case Report of Internet Gaming Disorder Treated with Bupropion and Cognitive Behavioral Therapy	A 13-year-old boy diagnosed with IGD showed marked improvement in gaming habits and social functioning after receiving a combination of CBT and Bupropion. This case emphasizes the effectiveness of CBT when paired with medication, and the need for further research to refine treatment protocols.
Niedermoser D.W., Hadjar A., Ankli V., Schweinfurth N., Zueger C., Poespodihardjo R., Petitjean S., Wiesbeck G., Walter M. (2021)	A Typical Case Report: Internet Gaming Disorder Psychotherapy Treatment in Private Practice	This case study of a 19-year-old adolescent demonstrated how CBT effectively reduced IGD symptoms without any shifts to other addictions. This is a notable case demonstrating CBT's effectiveness in treating non-substance addictions like IGD.
Ji Y., Wong D.F.K. (2023)	Effectiveness of an Integrated Motivational Cognitive-Behavioral Group Intervention for Adolescents with Gaming Disorder	In this RCT involving Chinese adolescents, an integrated CBT and motivational approach significantly reduced IGD symptoms, gaming time, and maladaptive gaming cognition. The intervention also led to a decrease in depression and anxiety symptoms, with long-term effects lasting up to 6 months.

Table 4: Overview Finding of Cross-Cultural and Mobile-Based CBT Interventions for IGD

As gaming behaviors and IGD are becoming increasingly recognized globally, researchers have developed cross-cultural and mobile-based CBT interventions to address these issues in different contexts. This theme shows interventions that have been tested across different cultures and delivery methods, such as mobile apps, demonstrating the flexibility and adaptability of CBT.

Author (Year)	Title	Finding
Kochuchakkalackal Kuriala G., Reyes M.E.S. (2023)	Cross-Cultural Efficacy of the Acceptance and Cognitive Restructuring Intervention Program (ACRIP) on the Internet Gaming Disorder Symptoms of Selected Asian Adolescents	ACRIP, developed for Asian adolescents, demonstrated its efficacy in reducing IGD symptoms and improving psychological well-being across different cultural settings. This study supports the use of culturally adaptive interventions to address IGD globally.
Pakpour A.H., Fazeli S., Zeidi I.M., Alimoradi Z., Georgsson M., Brostrom A., Potenza M.N. (2022)	Effectiveness of a Mobile App-Based Educational Intervention to Treat Internet Gaming Disorder Among Iranian Adolescents: Study Protocol for a Randomized Controlled Trial	This app-based intervention, incorporating CBT and the Transtheoretical Model (TTM), seeks to reduce IGD symptoms among Iranian adolescents. The study will assess the efficacy of this technology-based intervention in reducing IGD-related behaviors, depression, and anxiety.
Sharma Manoj Kumar, Anand Nitin, Tadpatrikar	Effectiveness of Multimodal Psychotherapeutic Intervention for Internet Gaming Disorder	A multimodal psychotherapy approach incorporating CBT, motivational enhancement, and behavioral strategies was effective in significantly reducing IGD

Ashwini, Marimuthu Palaniappan, Narayanan Gitanjali (2022)		symptoms and improving the quality of life for Indian participants. This highlights the flexibility of CBT when integrated with other therapeutic modalities.
Hofstedt A., Mide M., Arvidson E., Ljung S., Mattiasson J., Lindskog A., Söderpalm-Gordh A. (2023)	Pilot Data Findings from the Gothenburg Treatment for Gaming Disorder: A Cognitive Behavioral Treatment Manual	This study tested the efficacy of the GOT-TO-GO manual, a 15-week CBT-based program. It showed statistically significant reductions in gaming symptoms, and improvements in non-gaming leisure time, anxiety, and depression, sustained over a 3-month period.

Table 5: Overview Findings of Long-Term and Preventive CBT Interventions for Internet Use and Gaming Disorders

This theme focuses on CBT interventions aimed at the long-term treatment and prevention of IGD and other Internet use disorders. These studies emphasize the importance of early intervention and long-lasting effects of CBT in managing these conditions.

Author (Year)	Title	Finding
Lindenberg K.; Kindt S.; Szász-Janocha C. (2022)	Effectiveness of Cognitive Behavioral Therapy-Based Intervention in Preventing Gaming Disorder and Unspecified Internet Use Disorder in Adolescents: A Cluster Randomized Clinical Trial	The PROTECT CBT-based program reduced symptom severity among at-risk adolescents, preventing the full onset of gaming disorder. This long-term study demonstrated that CBT could play a critical role in preventing IGD if applied early.
André F., Kapetanovic S., Einarsson I., Trebbin Harvard S., Franzén L., Möttus A., Håkansson A., Claesdotter-Knutsson E.	Relapse Prevention Therapy for Internet Gaming Disorder in Swedish Child and Adolescent Psychiatric Clinics: A Randomized Controlled Trial	This randomized controlled trial found that relapse prevention therapy significantly reduced gaming disorder symptoms among Swedish adolescents, offering an effective preventive intervention for IGD.
Kapetanovic S., Gurdal S., Einarsson I., Werner M., André F., Håkansson A., Claesdotter-Knutsson E. (2023)	Relapse Prevention Therapy for Problem Gaming or Internet Gaming Disorder in Swedish Child and Youth Psychiatric Clinics: Protocol for a Randomized Controlled Trial	This protocol outlines a Swedish randomized controlled trial aimed at evaluating relapse prevention therapy for child and adolescent problem gaming. The study also examines the role of parent-child relationships in the success of the intervention.
Szász-Janocha C., Vonderlin E., Lindenberg K. (2021)	Treatment Outcomes of a CBT-Based Group Intervention for Adolescents with Internet Use Disorders	This long-term study on the PROTECT+ group CBT intervention showed significant reductions in IGD symptoms, depression, and anxiety among adolescents. The effects were sustained for up to 12 months, demonstrating the preventive power of group interventions.

Previous studies have proven Cognitive behavioral therapy is an effective intervention for Internet gaming disorders. Whether the application of Cognitive Behavioral Therapy as a self-standing intervention for Internet gaming disorder or in combination with other approaches such as medication and motivational strategy, it

showed efficacy in assisting individuals who suffered from Internet gaming disorder. Niedermoser et al. (2021) highlighted the efficacy of Cognitive behavioral therapy in reducing the symptoms of Internet gaming disorder, even though it is highly complex and involves severe social withdrawal behavior. On the other hand, the combination of Cognitive Behavioral Therapy and medication provides a comprehensive approach for managing individuals who suffer from Internet gaming disorders. A significant case reported by (Sravanthi et al., 2024) on combination of medication (Bupropion) and Cognitive Behavioral therapy on adolescents that suffered from internet gaming disorders showed a significant of improvement in gaming behaviors and social functioning. The combination of cognitive behavioral therapy with motivational strategies which focuses on cognitive and emotional aspects of a group-based intervention, whereby adolescents who suffer from Internet gaming disorder were encouraged to engage in meaningful real-life activities, self-explore their personal strengths, and set personal goals, resulted in a significant reduction in gaming disorder symptoms, maladaptive gaming cognition, and mental health conditions. (Ji & Wong, 2023). Cognitive behavioral therapy focuses on the importance of identifying cognitive distortions and maladaptive behaviors that are associated with gaming addiction. The combination approach provides a comprehensive treatment of internet gaming disorder,

In addition, cognitive behavioral therapy approaches practice the core principles that focus on altering maladaptive thoughts and behaviors that are adaptable to various cultural contexts. For instance, the Acceptance and Cognitive Restructuring Intervention Program (ACRIP), also known as cognitive behavioral therapy-based intervention of Internet gaming disorder that was developed in India, was effective in reducing Internet gaming disorder across diverse Asian Cultures which allowed cognitive behavioral therapy to be applied universally (Kochuchakkalackal Kuriala & Reyes, 2023).

Due to advancements in technology, adolescents tend to be viewed as a tech savvy group, where they are often occupied with gadget usage, making the mobile app-based intervention likely accepted by the tech savvy adolescent groups. Mobile apps that cooperate with the cognitive behavioral therapy approach are more structured, receive immediate feedback, and expand the reach of CBT-based interventions to improve the accessibility to engage with online therapy platforms (Pakpour et al., 2022). Previous studies have shown that the efficacy of Cognitive Behavioral Therapy approach is flexible and easy to adapt to various cultural contexts as well as technology platforms. Therefore, cognitive behavioral therapy is a powerful and widely accepted intervention for Internet gaming disorders.

The basic fundamental of Cognitive behavioral therapy that focuses on highlighting one's cognitive distortions and fostering constructive coping skills leading Cognitive Behavioral Therapy act as prevention that will reduce the risk of developing severe internet gaming disorder.(Lindenberg et al., 2022)highlighted Cognitive behavioral therapy is effective in reducing the severity symptoms of internet gaming disorder over a duration of 12 months. Besides preventive measures, the cognitive behavioral therapy approach in Internet gaming disorder also provides a positive long-term effect. The cognitive behavioral therapy-based relapse prevention approach shows the ability to reduce Internet gaming disorder over time, as this approach emphasizes the importance of identifying triggers that lead to gaming behaviors and the implementation of coping strategies for Internet gaming disorders (Andre et al., 2023).

In conclusion, cognitive behavioral therapy is an effective intervention to reduce the symptoms of Internet gaming disorders. The integration of cognitive behavioral with other approaches, such as medication and motivational approaches, further maximizes the effect of treatment. Cognitive behavioral therapy (CBT) is a highly flexible and high-adaptability intervention that can be altered to fit in various cultural contexts. In addition, the delivery of cognitive behavioral therapy through mobile app applications increases the accessibility to seeking help. Cognitive behavioral therapy provides a long-term treatment effect and serves as a preventive measure to reduce the risk of developing severe symptoms of internet gaming disorders.

CONCLUSION AND RECOMMENDATION

Cognitive behavioral therapy is an effective intervention for Internet gaming disorders. Although many studies have proven the efficacy of cognitive behavioral therapy, there are several limitations as many studies limited their research on certain populations. This may limit the generalization to other populations. Therefore, further studies should integrate the different demographic characteristics. Moreover, it is crucial to highlight other factors such as motivation level, availability of post-intervention support, attitude toward treatment, and treatment compliance to determine the long-term effectiveness of Cognitive Behavioral Therapy. In addition, the development of mobile-based cognitive behavioral therapy interventions should be culturally more sensitive,

as apps can be shared widely across the world. It is recommended to include motivation strategy as part of the intervention, especially in online cognitive behavioral therapy platforms.

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