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Intervention for Adolescent Gaming Addiction using Nominal Group Technique

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Abstract
The rapid rise in problematic gaming behaviours among adolescents has become a public concern. It contributes to social, academic, mental, behavioural, and physical health problems. Thus, the Nominal Group Technique (NGT) was utilised to design the intervention module and identify the primary components and elements of the intervention module framework. Through the NGT, seven expert counsellors validated key components, such as awareness of gaming habits, cognitive strategies, behaviour modifications, and relapse prevention. Using the NGT approach, the findings were employed to establish the main components as well as elements of the intervention module for gaming addiction behaviour among adolescents.
Keywords: Adolescents; Gaming Addiction; Intervention Module; Nominal Group Technique.

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1.0 Introduction

Play refers to a universal human recreational activity, and the internet has become an increasingly common playground for gamers. Indulging in gaming activities in the past may seem to be a normalised lifestyle. The accessibility of the internet and the availability of different gaming gadgets such as tablets, handphones, laptops, smart TVs, and game consoles have prolonged gaming activities. Although engaging in gaming is seen as a relaxation activity, excessive and uncontrollable gaming behaviours may lead to the development of gaming addiction. Gaming addiction is also referred to as gaming disorder or Internet Gaming Disorder. Game disorder has been officially included as one of the mental health conditions in the 11TH revision of the International Classification of Diseases (ICD-11) (World Health Organization, 2018). Following the ICD-11, gaming disorder is a pattern of gaming behaviour that features impaired control over gaming, prioritising gaming activities over other interests and daily responsibilities as well as continuation and persistence of gaming despite the emergence of negative outcomes (World Health Organization, 2020). The symptoms of gaming disorder must be exhibited for at least 12 months only to be diagnosed as gaming disorder, whereby the behavioural pattern affects one's daily functioning like family, social, personal, occupational, educational, or other crucial domains (World Health Organization, 2020). In contrast, the Diagnostic and Statistical Manual of Mental Disorders (DSM-5-TR) has suggested nine symptoms of Internet gaming disorder: 1. Preoccupation with or obsession with gaming; 2. Suffered from withdrawal symptoms such as anxiety, sadness, impatience, or feeling irritable; 3. Desire to engage more time in gaming to satisfy their desire to play; 4. Unable to reduce playing time and face challenges in quitting gaming; 5. Prioritise gaming activities and give up on other once-enjoyed hobbies; 6. Persistent in gaming,

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even though they were aware of the consequences; 7. Deceiving relatives and family members about the duration engaged in gaming; 8. Utilising gaming as an escape tool from feelings of depression, guilt, shame, or hopelessness; 9. The risk of losing a career or relationship due to gaming activities (American Psychiatric Association, 2013). Based on the suggested criteria, the diagnosis of Internet Gaming Disorder acquires five or more of the mentioned symptoms within 12-month periods (American Psychiatric Association, 2013).

The increasing number of adolescents engaging in gaming behaviour has raised public concern. Adolescents are vulnerable to the development of gaming addiction because of their distinct psychological and developmental traits and immature emotional regulation abilities (Schettler et al., 2024). Many studies have demonstrated that excessive gaming may lead to negative consequences, including carpal tunnel syndrome and obesity (Zakaria & Adnan, 2022). Aggressiveness (Bersani et al., 2022), poor visual impairment (Zakaria & Adnan, 2022), and developmental of depressive symptoms especially attributed to adolescents who were exposed to violent content gaming for more than two hours (Tortolero et al., 2014). Thus, it is vital to design effective interventions for adolescent gaming addiction. The research aimed to design an effective intervention for adolescent gaming addiction using Nominal Group Technique (NGT) to obtain expert input and feedback and prioritize key strategies for addressing gaming addiction. The research objectives were to identify the key component of the intervention module framework to assist adolescents in managing their gaming addiction based on the opinion of experts and to develop a systematic intervention module framework using the insight gained from the NGT approach. The framework will integrate the prioritized strategies into a unified intervention program designed especially for adolescents.

2.0 Literature Review

Several factors lead to developing gaming addiction in adolescents. Consequently, understanding the causes and factors that lead to the development of gaming addiction is crucial. Previous studies have revealed that personality characteristics, psychosocial factors (Akbari et al., 2023; Koay & Syed Mohammad, 2024), psychological factors (André et al., 2020), and motives for gaming are among the factors that influence addiction behaviour (Liu & Chang, 2016). Interventions for adolescents with gaming addiction are crucial. As excessive gaming behaviours are often viewed as a widespread practice, they are not viewed as a situation that needs to be considered until excessive gaming behaviours have been highly prioritised by gamers over other daily activities, which in turn affects one's daily functioning.

2.1 Self-awareness of gaming habits and motives

Liu and Chang (2016) have developed a model of online gaming addiction that highlights the role of computer-mediated communication motives in the establishment of online gaming addiction. The study revealed that mediated and interpersonal motives majorly impact flow experiences, which in turn influences addiction (Liu & Chang, 2016). The flow experiences are defined as the state of deep concentration, highly immersed in gaming activities whereby the individual experience loses track of time and self-awareness, which are due to: i. Mediated motive is the engagement in gaming behaviours due to personal reasons such as entertainment, passing the time, as well as use as an escape from stress or life challenges. ii. Interpersonal motives involve social factors such as social interaction and co-playing (Liu & Chang, 2016). The role of a computer-mediated communication model of online gaming addiction is presented in Figure 1.

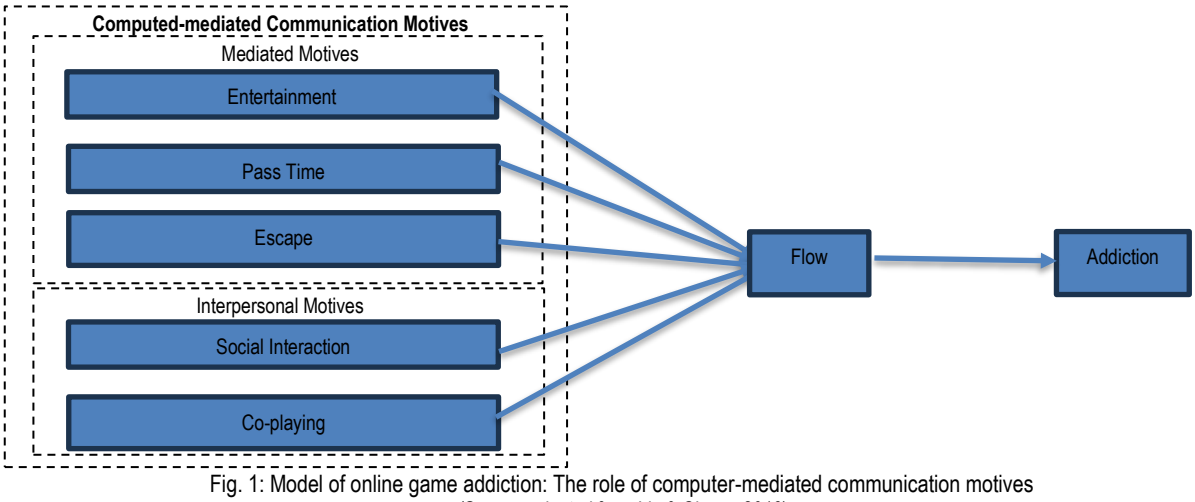

Fig. 1: Model of online game addiction: The role of computer-mediated communication motives
(Source: adopted from Liu & Chang, 2016)

Individuals with prolonged flow experience have a higher tendency to prolong gaming activities, which, in turn, will compulsively as well as excessively engage in gaming activities, leading to the development of gaming addiction. Other than that, Chang and Lin (2019) highlighted that motives for advancement, socialising, and escapism are often associated with problematic gaming behaviours. According to Chang and Lin (2019), escapism motives are a risk factor for developing gaming addiction. Awareness of online gaming habits and recognising gaming motives are crucial for the intervention strategy, as individuals who engage in excessive gaming activities are not aware of their behaviours even though they have surpassed the stage of healthy gaming to compulsive behaviours. Therefore,

helping individuals recognise the motives behind gaming activities, increasing awareness of one's gaming behaviours, and the negative consequences of gaming are important strategies for reducing gaming addiction.

2.2 Cognitive Behaviour Therapy

A great number of studies have proposed various interventions for managing gaming addiction: Multimodal Intervention (Sharma et al., 2022), the Acceptance and Cognitive Restructuring Intervention Program (ACRIP) (Kuriala & Reyes, 2020), Craving Behavioural Intervention (CBI), group counselling, and short-term Cognitive Behaviour Therapy (CBT) have been proven to be effective interventions for gaming addiction (Chen et al., 2023). Note that CBT is among the most popular and effective interventions for gaming addiction.

CBT is an effective intervention for problematic and addicted individuals (King et al., 2010; Wölfling & Dominick, 2022). Other than that, CBT facilitates individuals by recognising the automatic thoughts that lead to compulsive gaming and subsequently reduces the intensity of addiction through targeted cognitive strategies such as cognitive restructuring. A previous study reviewed four cognitive factors which sustain gaming behaviours: i. Prioritise gaming to gain social recognition and a sense of belonging; ii. Overdependence on gaming to satisfy or boost self-esteem, and iii. Overvalued beliefs about game rewards; and iv. Rigid and maladaptive norms for problematic gaming behaviour (King & Delfabbro, 2014). CBT highlights the importance of recognising cognitive distortions or maladaptive cognitive patterns and understanding how these thoughts lead to maladaptive behaviours, such as uncontrolled gaming behaviours (King & Delfabbro, 2014). Subsequently, CBT restructures individuals to change their perceptions and substitute them with rational thoughts.

Behavioural modifications such as self-monitoring and scheduling of alternative activities have proven to be effective in reducing gaming addiction. According to King et al. (2010), monitoring game usage, establishing appropriate goals, and addressing problem cognition contribute to strengthening and sustaining gaming behaviour. Monitoring game usage helps individuals be aware of the duration spent in gaming activities and promotes mindfulness about their gaming habits. Moreover, self-monitoring techniques help users understand the impact of the time they spend playing games and how it impacts other aspects of life, such as social relationships and academic and mental health, which will lead them to be more committed to change. Behavioural activation involves breaking the cycle of gaming activities by engaging highly in non-gaming activities, such as sports, cycling, or social outings. Hence, physical activities, hobbies, and meaningful social interactions facilitate individuals to shift their attention from gaming.

Relapse prevention is an essential component of addiction interventions. A previous study highlighted that relapse prevention is more effective than other conventional therapies in reducing gaming addiction symptoms (André et al., 2023). Relapse prevention focuses on helping individuals identify high-risk situations that may heighten gaming behaviours by learning coping strategies, such as seeking social support, problem-solving techniques, and stress management when dealing with triggers. These coping strategies assist adolescents to gain control and regulate their gaming behaviours. Note that individuals addicted to gaming often return to their old habits when they do not set clear boundaries in their daily routines. Thus, setting a clear game time limit and a balanced routine are essential to prevent addiction relapse.

Interventions for gaming addiction require an integrated approach involving self-awareness, cognitive change, behaviour modification, and relapse prevention. Therefore, identifying cognitive distortion, cognitive restructuring, monitoring, and tracking game habits, engaging in healthy routines, and relapse prevention are effective strategies for managing gaming addiction among adolescents.

3.0 Methodology

The Nominal Group Technique (NGT) was employed in this study. Here, the NGT technique is a systematic approach for group brainstorming and the contribution of ideas from the participants involved. NGT techniques have been introduced as a method for social planning situations (Delbecq & Van de Ven, 1971). NGT techniques are often used for decision-making, idea generation, problem-solving, or determining priorities (McMillan et al., 2016), especially in a group setting, getting public engagement, involving experts from diverse fields, and evaluating ideas and suggestions.

The NGT session was conducted online using Google Meet, whereby the expert panels brainstormed their ideas, opinions, suggestions, and solutions. Here, a total of 2 hours of Google Meeting sessions were executed. All the information and ideas collected from the brainstorming sessions were carefully gathered. Correspondingly, the participants were directed to assign ratings to the items organised according to the proposed components and subcomponents. Next, calculations were performed using the NGT approach.

3.1 Sampling

In this study, seven experts with experience and specialisation in managing adolescents with gaming addiction were selected. The amount is adequate as the NGT weighs quality over quantity by focusing on in-depth discussion and reducing the chance of social loafing. According to Lomax and McLeman (1984), NGT can be performed in small or large cohorts. Previous research has proposed that the sample size can be five to nine participants (Delbecq & Van de Ven, 1971).

3.2 NGT Techniques step

NGT Techniques consist of four steps: 1. Brainstorming: Participants work independently and spontaneously write down responses and solutions to stimulus questions; 2. Round-Robin Collection of Ideas: Participants take turns sharing their thoughts and ideas without further discussion, and all ideas shared will be gathered; 3. Discussion and Clarification: Discussion of ideas gathered to ensure all participants understand and clear the ideas, followed by refining or making suggestions to improve the ideas; 4. Voting: All participants cast their votes anonymously and ranked them based on the level of priorities. The process of NGT is presented in Fig 2. NGT techniques

provide a structured approach and often produce high-quality ideas and inputs as the participants meticulously discuss and carefully decide on the ideas to ensure the reliability and validity of the findings (Muqsith et al., 2017). Nevertheless, choosing experts based on their experiences, knowledge, as well as an in-depth understanding of gaming addiction offered a comprehensive solution by including various perspectives and providing highly credible findings. The NGT techniques are effective for short-term strategy identification and prioritization, but it has its limitations especially for ongoing evaluation or adaptation as circumstances change over time.

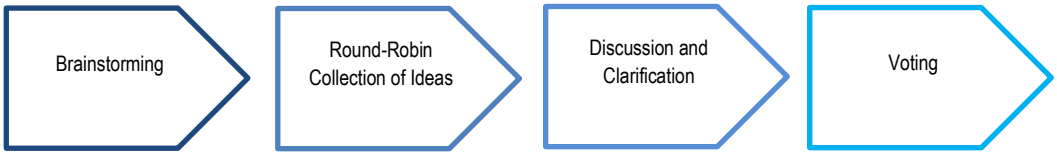

Fig. 2: Process of Nominal Group Technique

4.0 Findings

Table 1. Overall data intervention strategies in managing gaming addiction among adolescents.

Items/ Elements	Voter 1	Voter 2	Voter 3	Voter 4	Voter 5	Voter 6	Voter 7	Total Item score	Percentage	Rank Priority	Voter Consensus
Awareness of gaming habits, motives, and consequences of uncontrolled gaming behaviours.	3	3	3	3	3	3	3	21	100	1	suitable
Cognitive Strategies: Identifying cognitive distortions and cognitive restructuring.	3	3	3	3	3	3	2	20	95.24	2	suitable
Behaviour modification strategies: Self-monitoring and tracking game usage limits, healthy coping mechanism (problem-solving), and activity schedule.	3	3	3	3	3	2	2	19	90.48	3	suitable
Relapse prevention strategy: Identify triggers and patterns of gaming, create healthy boundaries for gaming, and build a sustainable routine.	3	2	3	3	3	3	2	19	90.48	3	suitable

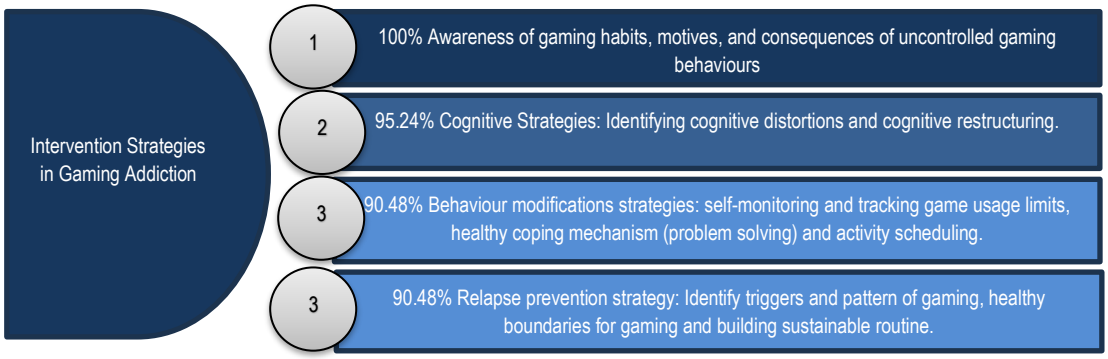

Fig. 3: Intervention Strategies Ranking

Referring to the expert's point of view, the intervention strategies for gaming addiction among adolescents are shown in Table 1. Overall, the analysis findings revealed that all components assessed in this study were within the acceptable range, which exceeded 70%. The findings indicated that the experts' approval and consensus were more than 70% from all experts, as multiple studies have mutually agreed and supported this point of view (Mustapha et al., 2022). Hence, the modified NGT approach is an ideal alternative to the Delphi method, which requires lengthy expert assessment cycles. The presented findings are the expertise and experiences of seven experts from counselling who are experienced in managing adolescents with gaming addiction. The awareness of gaming habits, motives, and consequences of uncontrolled gaming behaviours scored the highest at 100%, followed by cognitive strategies for identifying cognitive distortion and cognitive restructuring with a score of 95.24%. Behaviours modification strategies comprised self-monitoring, tracking game usage limits, healthy coping mechanisms (problem-solving), and activity scheduling, with a score of 90.48%. On the other hand, relapse prevention strategies comprised identifying triggers and patterns of gaming, healthy boundaries for gaming, and building sustainable routines with a score of 90.48%. In summary, these four core features are crucial for managing gaming addiction. The intervention strategies ranking is presented in Figure 3.

5.0 Discussion

The NGT findings highlighted the importance of including four main components: 1. Awareness of gaming habits, motives, and consequences of uncontrolled gaming behaviours; 2. Cognitive Strategies: Identifying cognitive distortions and cognitive restructuring; 3. Behaviour modification strategies: self-monitoring and tracking game usage limits, healthy coping mechanisms (problem-solving), and activity scheduling; and 4. Relapse prevention strategy: Identify triggers and patterns of gaming, healthy boundaries for gaming, and build a sustainable routine as an intervention strategy for managing adolescents' gaming addiction.

5.1 Awareness of gaming habits, motives, and consequences of uncontrolled gaming behaviours.
Increased awareness of one's gaming habits is the initial strategy for dealing with gaming addiction. The fundamental intervention strategy for gaming addiction is to increase awareness of gaming habits. Note that adolescents who engaged in excessive gaming tended to be unaware of their habits. Therefore, it is crucial to address the motives for gaming habits. Understanding the motives behind gaming plays a key role in increasing awareness of gaming patterns. The motives for online games may be categorised into two main categories: mediated as well as personal. Mediated motives included playing games as a form of entertainment, options for passing time, and escape from stress. Personal motives for fulfilling social needs include social interaction and co-playing. In addition, increased awareness of the consequences of gaming behaviours, such as obesity, deterioration in mental health, relationship issues, and poor academic performance, play a crucial role in addressing the potential risks and adverse effects of excessive gaming behaviours. Increased awareness helps the individual to see the need to change but also serves as a foundation for changing behaviour which aligned with the Self-Regulation Theory (Baumeister & Heatherton, 1996), which highlighted the role of self-awareness as a key to behavioural change. This strategy provides a foundation for more effective intervention.

5.2 Cognitive Strategies: Identifying cognitive distortions and cognitive restructuring.
Previous studies have addressed cognitive distortions as the root cause of long-term addictive behaviour. King and Delfabbro's (2014) identified cognitive biases such as the illusion of control and escapism as key factors that perpetuate gaming dependency. For example, distorted thoughts like "I must play to avoid stress" or "Playing games is the only options that make me feel happy" exemplify the distorted thoughts that sustain addiction. Identifying these cognitive distortions is essential to changing the thought patterns that prolong addiction behaviour. The implementation of cognitive restructuring identifies distorted thoughts and replaces healthy and rational ones.

5.3 Behaviour modification strategies: Self-monitoring and tracking game usage limits, healthy coping mechanisms (problem-solving), and activity scheduling.
Behavioural modifications involve changes in one's daily actions and habits. Hence, monitoring and tracking game usage limits are significant in helping individuals be mindful and aware of how their gaming addictions affect their lives. Apart from that, learning healthy coping mechanisms, such as problem-solving, empowers them to feel confident dealing with their life challenges and gain control over solutions. Activity scheduling by engaging in physical activities such as exercise, socialising with friends, learning new skills, or finding new hobbies reduced gaming time. This aligns with Displacement theory, which holds that devoting time to enjoyable alternative activities naturally limits the time available for gaming.

5.4 Relapse prevention strategy: Identify triggers and patterns of gaming, healthy boundaries for gaming, and build a sustainable routine.
Relapse prevention strategies play a crucial role in breaking the gaming addiction cycle. A large number of studies show that adolescents who suffer from gaming addiction are successful in breaking the gaming addiction cycle but revert to old behaviours when there is insufficient support. Therefore, relapse prevention strategy is a key component in sustaining healthy new gaming habits. Individuals must be mindful of their gaming habits and identify the triggers and patterns of gaming. There is a clear boundary between gaming time and daily responsibilities. This includes setting realistic gaming time limits to ensure that gaming is not the primary activity in their lives. In general, this study redefines the understanding and management of gaming addiction across domains, providing insights for mental health practices, education and family interventions. The findings underscore the importance of multidisciplinary approaches to reducing gaming-related risks.

6.0 Conclusion & Recommendations

Overall, interventions for gaming addiction among adolescents require a comprehensive approach involving self-awareness, cognitive strategies, behaviour modification strategies, and relapse prevention. The inclusion of awareness of gaming habits, motives, and effects facilitates the identification of the root of the problem. Apart from that, cognitive strategies such as identifying distorted thoughts and cognitive restructuring enable them to identify unhealthy thoughts that sustain gaming addiction behaviours. Behaviour modification includes self-monitoring and tracking game usage limits, healthy coping mechanisms (problem-solving), and activity scheduling, emphasising the importance of monitoring their gaming behaviour to create mindfulness about their actions. This empowers them to regulate their behaviours by developing a healthy coping mechanism. Relapse prevention ensures that individuals break the addiction cycle. However, regional, social and cultural variations in gaming behaviors and addiction patterns may restrict how broadly the interventions can be applied. Communities with varying gaming trends and cultural attitudes toward gaming may find these findings less applicable. Addressing this limitation requires tailoring intervention to accommodate these differences and ensuring inclusivity in their design and implementation. Further research should focus on enhancing self-awareness of gaming behaviours and motivations, utilizing technologies like monitoring applications and artificial intelligence to offer individualized, adaptive alternatives to conventional therapy. These approaches can enhance the scope and efficacy of gaming addiction interventions among varied demographics.

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Paper Contribution to Related Study Field

This study contributes to the existing body of knowledge by addressing a key gap in the study of gaming addiction: The role of Computer-Mediated Communication (CMC) motives. Previous studies have focused on gaming behaviour, but only a few have investigated how communicative incentives, such as social connection, recognition, and relationship-building, influence addiction. By exploring these perspectives, this study expands the theoretical understanding of gaming addiction and provides practical insights for designing interventions.

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