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Reducing Online Gaming Duration Through a Self-Control Program: A Behavioral Approach

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A B S T R A C T

This experimental examines the effectiveness of a structured self-control intervention in reducing excessive online gaming among adolescent boys diagnosed with Internet Gaming Disorder (IGD). Thirty-seven participants, identified using the 27-item Internet Gaming Disorder Scale, were randomly assigned to intervention and control groups. The intervention, based on Martin and Pear's (2019) behavioral framework, comprised five face-to-face sessions over five days, accompanied by an 11-day self-recording task to track gaming behavior. Employing a randomized controlled trial, the study revealed a significant reduction in gaming duration in the intervention group compared to controls ($U = 32.50$, $p < .001$), confirming the program's efficacy. These findings emphasize the value of targeted behavioral interventions in mitigating IGD's adverse effects, such as diminished psychological well-being and academic performance. While promising, the study's short intervention period and demographic specificity suggest the need for further research to explore long-term impacts and broader applicability.

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INTRODUCTION

The rapid evolution of technology has profoundly transformed the gaming industry, notably through the transition from offline to online gaming, which facilitates unrestricted interactions via the internet (Adams, 2010). This shift has fueled significant growth in the global gaming market, with Indonesia emerging as a major player, ranking second in terms of internet users engaging in online gaming (Kemp, 2023). Indonesia is home to over 170 million gamers, with male players (82.4%) far outnumbering females (17.6%) (Sihombing & Manurung, 2022).

The increasing prevalence of online gaming has coincided with a growing risk of Internet Gaming Disorder (IGD), a behavioral condition marked by excessive and compulsive gaming that disrupts daily life activities (APA, 2022). Tolerance, defined as the need for prolonged gaming sessions to achieve the same level of satisfaction, is a key diagnostic criterion for IGD (APA, 2022). Adolescent boys are particularly vulnerable to IGD, exhibiting higher addiction rates and IGD severity scores compared to girls, as demonstrated in multiple studies (King & Delfabbro, 2019; Rangkuti et al., 2021; Sari et al., 2023).

Excessive gaming duration is linked to a range of negative outcomes, including academic underperformance, family conflicts, and diminished social interactions (Hanum, 2015). Research has established a direct correlation between prolonged gaming and the severity of IGD symptoms (King & Delfabbro, 2019). Adolescents with high gaming tolerance often struggle to regulate their screen time, leading to a reorganization of priorities that compromises essential activities such as sleep and meals.

To address IGD, various interventions have been proposed, with behavioral modification techniques showing significant promise. Among these, self-control programs have emerged as an effective approach to reducing gaming duration and mitigating IGD symptoms (Martin & Pear, 2019). Empirical evidence supports their efficacy; for example, Ulfa's (2015) study found that self-control strategies significantly decreased gaming from 4–8 hours per day to 2 hours. Similarly, Ramadhani et al. (2019) highlighted the positive impact of self-control training in reducing IGD tendencies among school-age children.

LITERATURE REVIEW

Internet Gaming Disorder

Internet Gaming Disorder (IGD) is defined as a persistent and excessive use of online games that causes significant clinical distress or impairment, characterized by at least five of nine criteria within 12 months, including loss of control, increased tolerance, withdrawal symptoms, and neglect of other activities such as school, work, and social responsibilities (APA, 2022). Substantial impacts including academic failure, job loss, and damaged social relationships.

IGD is influenced by individual, external, and game-related factors. Individual factors include adolescent age (particularly males), impulsivity, aggressiveness, anxiety, poor self-regulation, self-esteem, and self-efficacy. External factors encompass peer influence, easy access to games, an unstable

family environment, and relationship trauma. Additionally, the type and interactive features of games also contribute to the development of IGD. The combination of these factors makes individuals more vulnerable to gaming addiction.

Self-Control Program

According to Martin and Pear (2019), a self-control program is a behavioral management strategy that involves reducing excessive behaviors that provide immediate gratification while promoting positive behaviors such as studying and exercising. This approach, also known as self-management or self-modification, employs behavior modification principles to help individuals regulate their actions by adjusting their environment to support desired behaviors.By using the following steps: (a) specify the problem and set goals, (b) make a commitment to change, (c) take data and assess the causes of the problem, (d) design and implement a treatment plan, and (e) prevent relapse and make your gains last.

The proposed hypothesis is that the implementation of a self-control program can reduce the duration of online gaming among adolescent boys with Internet Gaming Disorder. The variables in this study are the self-control program and online gaming duration. Figure 1 below presents the conceptual framework of this study:

Figure 1. Conceptual Framework

METHODOLOGY

Research Design

This study employed a True-Experimental Design with a Pretest-Posttest Control Group Design to control for threats to validity. Participants were randomly assigned to either the experimental group, which received the self-control program, or the control group, which did not receive any intervention. Both groups underwent assessments to measure baseline and follow-up gaming duration.

Participants

The participants in this study consisted of 40 male middle school students diagnosed with moderate to severe Internet Gaming Disorder. The selected participants were then randomly assigned to either the experimental or control group using a random assignment technique. To ensure group equivalence, the researchers applied a matching technique based on the screening results of the IGD scale.

Instruments

Data collection in this experimental study utilized a standardized scale and self-recording observation sheets. The Internet Gaming Disorder Scale, based on the nine DSM-5 criteria and developed by Lemmens et al. (2015), was employed to measure IGD severity. Translated and adapted by Rangkuti et al.

(2021), the scale demonstrated strong reliability (α = 0.88) and used a Guttman format with binary responses (1 = "Yes," 0 = "No"), where higher scores indicated greater IGD severity.

Gaming behavior duration was tracked via self-recording observation sheets, documenting participants' gaming times. Data were collected in two phases: a four-day baseline and a seven-day follow-up. This study analyzed only data on gaming timing and duration.

Procedure

The intervention program spanned five sessions, guiding participants in a self-control program to reduce online gaming duration. The first session introduced the program through ice-breaking activities, informed consent, and an overview of IGD, including its symptoms and impact. The second session identified gaming-related issues and set reduction goals. Participants analyzed their gaming habits, set targets, involved parents for accountability, documented commitments, and received self-recording sheets for behavior tracking. In the third session, participants conducted a behavioral analysis, reviewing self-recorded data to identify patterns, triggers, and environmental influences. The fourth session introduced behavior modification strategies using the Antecedent-Behavior-Consequence (A-B-C) model, where participants developed personalized self-control strategies and created behavioral contracts with parental involvement. A follow-up self-recording task was also assigned. The final session assessed progress by comparing baseline and follow-up data, fostering reflections, expressions of appreciation, and encouragement to maintain self-regulation. Detailed procedural steps are provided in the APPENDIX.

Data Analysis

Data were analyzed using JASP software, employing descriptive statistics and the Mann-Whitney U test to evaluate the hypothesis. This non-parametric test was chosen for its suitability with non-normally distributed data.

Table 1. Intervention Implementation Procedures

Hari/Sesi	Activity	Purpose	Procedure
I/1	Introduction	Build rapport and engage participants	Ice-breaking activity and participant introductions
I/2	Program Overview, Guidelines, and Informed Consent	Explain the intervention structure and ethical considerations	Presentation of program schedule, rules, and distribution of consent forms
I/3	Understanding IGD	Provide knowledge on IGD symptoms and impact	Lecture and Q&A session
I/4	Closing	Conclude the first meeting.	Express gratitude and schedule the next meeting.

II/5	Ice Breaking	Foster a positive atmosphere	Relay Drawing Game with rewards
II/6	Specify Problem & Goals (1)	Help participants recognize gaming-related issues	Discussion on gaming behavior patterns
II/7	Specify Problem & Goals (2)	Establish clear, measurable goals	Setting gaming reduction targets and involving parents
II/8	Commitment to Change	Strengthen motivation and accountability	Writing commitment statements and documenting expected benefits
II/9	Closing	Assign baseline tasks and conclude the second meeting.	Distribute self-recording sheets to complete over four days.
III/10	Ice Breaking	Create a positive atmosphere and increase participation.	Document objects at school, and reward the winning group.
III/11	Analyze Pronblem (1)	Review recorded gaming habits	Discussion of self-recording data from the baseline task
III/12	Analyze Problem (2)	Identify behavioral patterns	Analysis of frequency, timing, and situational gaming factors
III/13	Analyze Problem (3)	Determine underlying triggers	Discussion on personal and environmental factors influencing gaming
III/14	Closing	Conclude the third meeting.	Express gratitude and schedule the next meeting.
IV/15	Ice Breaking	Create a positive atmosphere and increase participation.	Simon Says game
IV/16	Treatment Plan (1)	Introduce self-control prpogram techniques	Explanation of Antecedent-Behavior-Consequence (A-B-C) strategies
IV/17	Treatment Plan (2)	Develop practical self-control strategies	Written task and group discussion on

			management techniques
IV/18	Prevent Relapse	Ensure sustainability of behavior change	Establishment of a behavioral contract with parental involvement
IV/19	Closing	Assign follow-up self-recording task	Instructions for seven-day follow-up tracking
V/20	Ice-breaking Activity	Create a positive atmosphere	3, 6, 9 DOR!! game
V/21	Review of Key Concepts	Reinforce previous lessons	Brief recap and interactive Q&A session
V/22	Review of Self-Recording Task	Analyze changes in gaming behavior	Graphing progress and discussion of results
V/23	Closing	Conclude the intervention program	Reflection session and appreciation for participation
V/21	Review of Key Concepts	Reinforce previous lessons	Brief recap and interactive Q&A session
V/22	Review of Self-Recording Task	Analyze changes in gaming behavior	Graphing progress and discussion of results
V/23	Closing	Conclude the intervention program	Reflection session and appreciation for participation

RESULTS AND DISCUSSION

This section presents the study's findings on the effectiveness of the self-control program in reducing gaming duration among adolescent boys diagnosed with Internet Gaming Disorder (IGD). Prior to this, the demographic characteristics of the participants are outlined, providing essential details such as their age range, grade levels, and baseline gaming duration.

Demographic Information

Tabel 2. Demographic Information

Demographic	**Total (N)**		**Total**
	Experiment	**Control**	
Age			
12	0	3	3
13	7	7	14
14	5	7	12

15	5	3	8
Total	17	20	37
Grade Level			
VII	4	3	7
VIII	4	11	15
IX	9	6	15
Total	17	20	37
Gaming Duration Before Treatment			
Experiment		**Control**	
Partisipant	**Duration/Mnt**	**Partisipant**	**Duration/Mnt**
1	480	1	120
2	180	2	240
3	780	3	180
4	180	4	120
5	240	5	60
6	480	6	420
7	360	7	240
8	60	8	120
9	240	9	120
10	180	10	60
11	120	11	180
12	60	12	180
13	240	13	120
14	300	14	180
15	300	15	180
16	240	16	60
17	120	17	180
		18	60
		19	120
		20	120

In the above Table 1., the study show demographic breakdown of a sample of 37 adoloescent boys two category school grade level dan age. The school grade level distribution shows 7 adolescents are in class VII, 15 adolescents in each of grades VIII and IX. The age distribution of the participants are 3 adolescents aged 12 years, 14 adolescents aged 13 years, 12 participants aged 14 years, and 8 adolescents aged 15 years. The duration data before the intervention showed that the maximum gaming duration among participants was 480 minutes per day, while the minimum was 60 minutes per day.

Findings

The hypothesis in this study proposed that the self-control program would effectively reduce the gaming duration of adolescent boys diagnosed with Internet Gaming Disorder (IGD). To evaluate this hypothesis, a comparative analysis was conducted using the Mann-Whitney U test.

Tabel 3. Mann-Whitney U Analysis

	U	p	Rank-Biserial Correlation	SE Rank-Biserial Correlation
Durasi	32.500	< .001*	-.809	.191

*Significant at p = < .001 level of significant

The results of the Mann-Whitney U test indicate a statistically significant difference in gaming duration between the experimental and control groups, U = 32.50, p < .001. The calculated effect size (r = .809) further highlights the substantial impact of the self-control program, exceeding the threshold for a strong effect (r > .5; Gravetter & Wallnau, 2016). Participants in the experimental group demonstrated a significant reduction in gaming duration during the post-test (follow-up) compared to the pre-test (baseline), underscoring the effectiveness of the intervention in addressing excessive online gaming behaviors among adolescent boys with Internet Gaming Disorder. These findings support the hypothesis that the self-control program is an effective behavioral intervention for managing gaming duration in this population.

This study provides compelling evidence that the self-control program is an effective intervention for reducing online gaming duration among adolescent boys diagnosed with Internet Gaming Disorder (IGD)**.** The findings demonstrate a significant decrease in gaming duration following the intervention compared to the pre-intervention period, reinforcing the program's efficacy in addressing problematic gaming behaviors.

These results are consistent with previous research, further validating the role of self-regulation training in reducing excessive gaming. Harkina et al. (2019) found that implementing self-management strategies led to a noticeable decline in online gaming duration among adolescents. Similarly, a study by Ramadhani et al. (2019) examined the effectiveness of self-control training in reducing IGD tendencies among school-aged children, demonstrating a reduction in gaming duration within just one week among those in the experimental group. Additional support for the effectiveness of self-control training is provided by Ponda & Satria (2022), whose study found that implementing such training reduced gaming time from a maximum of 15 hours per day to a minimum of 2.5 hours and a maximum of 6 hours among adolescents classified as at-risk for online gaming addiction**.**

From a theoretical perspective, the self-control program is rooted in behavioral theory**,** which emphasizes the regulation of behavior through structured antecedent management, behavior modification, and reinforcement strategies (Martin & Pear, 2019). The program aims to identify and address

factors contributing to excessive gaming while equipping individuals with strategies to manage their urges to play (Miltenberger, 2016). A distinctive feature of this study is its adaptation of prior methodologies to include parental involvement through behavioral agreements, enhancing the intervention's effectiveness (Ulfa, 2015).

One of the key differences between this study and prior research lies in the screening method and the implementation of independent tasks. In this study, participants were systematically classified based on the IGD Scale, ensuring a more objective assessment of their gaming behavior. In contrast, previous studies relied primarily on brief interviews, which may have introduced subjectivity and inconsistency in participant selection. Additionally, this study incorporated parental supervision in the execution of independent tasks, whereas prior research did not formally integrate this component, despite earlier recommendations by scholars. This distinction highlights the importance of external support systems, particularly family involvement, in sustaining behavioral change.

A critical factor influencing the success of this intervention is parental involvement in monitoring, regulating, and reinforcing behavioral changes in gaming habits. Parents play an essential role in providing social support, setting boundaries, and enforcing consequences when necessary. To strengthen self-regulation, adolescents were required to draft a behavioral contract, outlining specific steps they would take to prevent gaming-related triggers. Moreover, participants had to define the role of their parents in managing potential consequences, including restricting gadget access that enables excessive gaming.

Miltenberger (2016) identifies behavioral contracting and social support as crucial elements in self-control programs, particularly parental reinforcement strategies. Supporting evidence for parental involvement's role in mitigating gaming addiction is found in research by Kadir et al. (2020), which demonstrated that parental monitoring, time restrictions on gaming, and consequences such as confiscating devices or limiting internet access were effective in curbing excessive gaming. Similarly, Munir and Rizqi (2022) emphasized the vital role of parental supervision, highlighting actions such as removing access to mobile phones, supervising study sessions, setting time limits, providing guidance, redirecting attention toward alternative activities, and ensuring compliance with gaming restrictions. These findings reinforce the multifaceted role of parental engagement in fostering long-term behavioral change in adolescents struggling with IGD.

Another critical mechanism in the success of the self-control program is the use of reinforcement strategies. Positive reinforcement has been widely recognized as an effective approach for shaping and maintaining desired behaviors (Martin & Pear, 2019). In this study, rewards were provided to participants who successfully reduced their gaming duration as a motivational **tool** to encourage sustained behavioral change.

These findings align with Kase et al. (2024), who demonstrated that self-determined rewards, such as stationery and writing tools, were effective in enhancing self-control and reducing online gaming addiction among students.

The study emphasized that reward-based reinforcement helps strengthen positive behavioral patterns, providing individuals with tangible incentives to persist in reducing gaming time. Similarly, Dewi (2020) found that play therapy combined with positive reinforcement was effective in addressing gadget addiction among children. The study reported a significant reduction in screen time, with daily usage decreasing from 6–7 hours to just 2 hours post-intervention. These findings underscore the importance of reinforcing desirable behaviors through both intrinsic and extrinsic motivators to facilitate long-term behavioral adjustments.

Beyond reinforcement, the self-control program employed varied intervention strategies to maximize its effectiveness. A combination of lectures, guided discussions, independent assignments, and reflection sessions was implemented to provide participants with a comprehensive understanding of self-regulation techniques (Santrock, 2003). This diverse approach ensured that participants not only grasped theoretical concepts but also internalized and applied self-control techniques in real-world scenarios.

By integrating theoretical foundations, structured intervention models, and parental engagement, this study provides strong empirical support for self-control programs as a viable solution for mitigating online gaming addiction among adolescents. Future research should explore long-term interventions, assess sustained behavioral changes, and examine individual differences in responsiveness to self-control training. Additionally, incorporating technology-based monitoring tools, such as gaming time tracking apps, could further enhance accountability and effectiveness in regulating gaming behaviors.

In conclusion, this study underscores the effectiveness of self-control programs in helping adolescents reduce excessive gaming and develop greater self-regulation skills. By combining behavioral modification techniques, parental involvement, reinforcement strategies, and diverse learning methods, this intervention offers a comprehensive and practical approach to addressing Internet Gaming Disorder. Given the growing concerns surrounding IGD, the continued refinement and implementation of evidence-based intervention programs remain essential in promoting healthier gaming habits and overall well-being among adolescents.

CONCLUSIONS AND RECOMMENDATIONS

This study concludes that the self-control program has a significant and measurable impact on reducing online gaming duration among adolescent boys diagnosed with Internet Gaming Disorder (IGD). The findings demonstrate that the intervention effectively decreases gaming duration, with participants in the experimental group showing notable reductions after the program. These results underscore the potential of structured self-control interventions as an evidence-based approach to addressing the challenges associated with IGD.

From a practical standpoint, adolescents should be encouraged to engage in alternative, productive activities that foster personal growth and development. Parents play a pivotal role in guiding and monitoring their children's gaming habits, ensuring that gaming does not interfere with essential daily

responsibilities. Schools can adopt the self-control program as part of their educational initiatives, embedding it into the curriculum and collaborating closely with parents to create a supportive environment.

Furthermore, healthcare professionals and community organizations should be involved in raising awareness about the risks of IGD and promoting behavioral interventions like the self-control program. By fostering active engagement among all stakeholders, adolescents can develop critical self-regulation skills, effectively manage gaming behaviors, and achieve a healthier balance in their daily lives. Future research should explore the long-term effectiveness and adaptability of the program across diverse populations.

FURTHER STUDY

This study has several limitations, particularly in controlling participant attendance, which influenced the extent of behavioral changes observed. While efforts such as reminders and review sessions were implemented to mitigate this issue, inconsistencies in attendance may have affected the reliability of the intervention outcomes. Future studies should consider structured engagement strategies to improve adherence and ensure more consistent participation.

Another limitation lies in the self-recording observation sheet, which, despite being based on Martin & Pears (2019) theoretical framework, had not undergone formal validation. The reliance on self-reported data introduces potential biases, such as overestimation or underreporting of gaming duration. Future research should aim to validate this instrument or incorporate objective tracking tools, such as screen-time monitoring applications, to enhance measurement accuracy.

Additionally, the self-control program module, while effective, was not entirely aligned with theoretical frameworks, which may have influenced the intervention's overall impact. Future research should refine the module to ensure stronger theoretical integration and explore personalized intervention approaches to accommodate individual differences in motivation and self-regulation abilities.

Finally, this study did not assess the long-term sustainability of behavioral changes. While a significant reduction in gaming duration was observed, the extent to which participants maintained these changes remains unclear. Future research should consider longitudinal studies to evaluate the lasting effects of the intervention and identify factors that contribute to relapse or sustained improvement. Addressing these limitations will strengthen the effectiveness and applicability of self-control programs in managing Internet Gaming Disorder among adolescents.

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