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The effectiveness of ifdil perceptual light technique (iplt) as a visual intervention in reducing online game addiction

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ABSTRACT

The rapid development of digital technology has increased online gaming among adolescents, with some experiencing addiction that affects psychological, social, and academic functioning. This phenomenon was identified among adolescents in the Mulya Tarai Gading Housing Complex, Kampar Regency. This study examined the effectiveness of the Ifdil Perceptual Light Technique (IPLT) as a visual-based intervention to reduce online gaming addiction. A quantitative pre-experimental one-group pretest–posttest design was employed. From a population of 100 adolescents, six participants with moderate to high addiction levels were selected through purposive sampling. Data were collected using a Likert-based online gaming addiction scale and analyzed through descriptive statistics, normality testing, paired-sample t-tests, and Cohen's d effect size. Results showed a reduction in the mean addiction score from 42.33 to 26.33, with a significant difference between pretest and posttest scores ($p < 0.05$). The findings indicate that IPLT is an effective and innovative intervention for reducing online gaming addiction and contributes to the development of adaptive visual-based counseling approaches in the digital era.

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Introduction

The development of digital technology in recent decades has brought significant changes to people's lifestyles, particularly among adolescents. One of the most prominent phenomena is the increasing use of online games as both a form of entertainment and a digital-based social activity. Online games are no longer simply a recreational medium but have become an integral part of a lifestyle, integrated into the daily lives of adolescents. This situation has serious implications when online game use develops into addictive behavior that is difficult to control. The phenomenon of online game addiction is now globally recognized as a form of behavioral disorder that impacts an individual's psychological, social, and academic aspects (Limone et al., 2023; Rosendo-Rios et al., 2022).

Globally, the prevalence of online gaming addiction is showing an increasing trend, particularly among adolescents and young adults. Systematic reviews indicate that online gaming addiction is closely related to various psychological factors such as loneliness, a lack of meaning in life, and an inability to meet basic psychological needs (Kaya et al., 2024; Gao et al., 2024). Depression has likewise been identified as an emotional condition that frequently accompanies online gaming addiction in adolescents (Nurmagandi & Suratmini, 2024). Furthermore, this addiction is also influenced by social factors such as a lack of interpersonal skills and an unsupportive family environment (Mun & Lee, 2022). Family dynamics appear especially influential, as interparental conflict, the quality of the parent–adolescent relationship, parental attitudes, and experiences of social exclusion have all been associated with the emergence of online gaming addiction (Wang, 2022; Dwi Kurnia et al., 2023; Muezzin et al., 2024). Other research shows that online gaming addiction directly impacts learning motivation and academic engagement (Sun et al., 2023). This reinforces the notion that gaming addiction is not simply a matter of habit, but rather a complex problem involving the interaction of psychological, social, and digital environmental factors.

In Indonesia, the phenomenon of online gaming addiction is also showing alarming figures. Data shows that the majority of adolescents aged 10–18 have been exposed to online games, with a significant percentage experiencing increased daily gaming time (Budiawan et al., 2024). In fact, some adolescents spend more than four hours per day playing games, a key indicator of addiction. Other research reveals that most adolescents fall into the moderate to severe addiction category, with gaming time ranging from three to five hours per day (Surbakti et al., 2022). Comparable findings have been reported in adolescent populations elsewhere, including a notable rise in digital game addiction during the Covid-19 pandemic (Cırıs et al., 2022; Lona et al., 2023). This indicates that online gaming addiction has become a widespread phenomenon and has the potential to disrupt optimal adolescent development.

The impacts of online gaming addiction are diverse and encompass various aspects of life. Psychologically, gaming addiction can cause emotional disturbances such as irritability, anxiety, and stress. Socially, individuals tend to withdraw from their environment and prefer virtual interactions over real-life interactions (Hidayat et al., 2022). Academically, gaming addiction impacts decreased concentration, learning motivation, and academic achievement (Sun et al., 2023). Furthermore, gaming addiction can also trigger aggressive behavior, both verbal and non-verbal, due to exposure to violent content in games (Budiawan et al., 2024). It has further been associated with disturbances in adolescents' emotional levels and with poorer social adjustment (Istiqomah et al., 2023; Zatrahadi et al., 2021). This indicates that online gaming addiction has serious consequences that impact not only the individual but also their social environment.

The Indonesian Ministry of Health confirms that online gaming addiction falls under the category of behavioral disorders, characterized by an inability to control gaming activities, an increased prioritization of gaming over other activities, and continued gaming despite negative consequences (Ministry of Health of the Republic of Indonesia, 2018). Furthermore, gaming addiction is also linked to disruptions in the brain's dopamine system, which causes individuals to become dependent on the visual stimuli and rewards provided by gaming (Hartanti, 2022). Thus, online gaming addiction is not only a behavioral issue but also involves complex neuropsychological mechanisms.

The phenomenon of online game addiction can also be seen in real life, particularly among teenagers living in residential areas. In the Mulya Tarai Gading Housing Complex in Kampar Regency, for example, there is a trend of increasing online gaming activity among teenagers. Teenagers tend to spend their free time playing games intensively, even to the point of neglecting study, social interactions, and other responsibilities. This phenomenon indicates signs of addiction, characterized by difficulty controlling playing time, increasing dependence on games, and behavioral changes that lead to a decline in social and academic functioning. This situation reinforces the urgency of appropriate interventions to address this problem.

Current intervention approaches to address online gaming addiction are still dominated by cognitive and behavioral approaches, such as conventional counseling and cognitive-based therapy. A variety of counseling-based strategies have been developed for this purpose, including creative cognitive behavior counseling, group counseling, and guidance-and-counseling-based modeling of

addiction dynamics (Prasetiawan et al., 2023; Husniah et al., 2023; Saman et al., 2022). Cognitive behavioral therapy in particular has shown promise in preventing and treating gaming disorder, and relapse-prevention approaches have also been trialed, although the overall efficacy of such treatments is still considered modest (Lindenberg et al., 2022; Chang et al., 2022; André et al., 2023). These approaches have not optimally addressed the perceptual and sensory aspects underlying gaming addiction, particularly the intense visual stimuli present in online games. Yet, numerous studies have shown that visual stimuli play a significant role in influencing an individual's cognition, emotions, and behavior (Fadhilah et al., 2022; Siagian et al., 2010). Visual-based interventions have been shown to be effective in improving understanding, modifying behavior, and strengthening memory and perception (Ifdil et al., 2019; Ifdil et al., 2023).

In this context, the Ifdil Perceptual Light Technique (IPLT) presents itself as an innovative approach in counseling that utilizes visual stimuli in the form of light to influence an individual's perceptual and emotional systems. IPLT is an intervention technique designed to access and modify psychological responses through targeted visual stimulation (Ifdil et al., 2019). Recent developments indicate that IPLT has been developed into a more systematic and effective technology in addressing various psychological issues, including trauma and phobias (Ifdil et al., 2023). Furthermore, IPLT can also be integrated with spiritual approaches, such as the use of Quranic verses, which can increase the effectiveness of interventions in the context of values-based counseling (Miftahhuddin et al., 2024).

The main advantage of IPLT lies in its ability to directly target the visual perception system, a key pathway in online gaming addiction. Online gaming inherently provides intense and repetitive visual stimuli, which trigger the brain's reward system. Therefore, visual-based interventions, such as IPLT, have great potential to rebalance an individual's perceptual and emotional systems. In other words, IPLT works on the same pathways as gaming addiction, but with therapeutic goals. This makes IPLT a relevant and innovative approach to addressing online gaming addiction.

Research examining the effectiveness of IPLT in the context of online gaming addiction is still very limited. Most IPLT research still focuses on treating trauma, phobias, and other psychological problems (Ifdil et al., 2019; Ifdil et al., 2023). On the other hand, research on online gaming addiction focuses more on the causes and impacts, without exploring visual-based interventions as solutions (Nursalam et al., 2023). This indicates a research gap that needs to be filled by developing innovative interventions tailored to the characteristics of online gaming addiction. The novelty of this research lies in the use of IPLT as a visual-based perceptual intervention to reduce online gaming addiction in adolescents. This study integrates two main concepts: online gaming addiction as a visual stimulus-based behavioral disorder and IPLT as a visual intervention that works on the perceptual system. This approach is expected to provide new contributions to the development of more effective and relevant intervention methods for today's digital society. The purpose of this study was to test the effectiveness of Ifdil Perceptual Light Technique (IPLT) as a visual intervention in reducing online gaming addiction in adolescents. This research is expected to provide theoretical contributions in the development of counseling science, particularly in the use of visual-based interventions, as well as practical contributions in efforts to treat online game addiction among adolescents.

Method

Research Design

This study uses a quantitative approach with a one-group pretest–posttest pre-experimental design. This design was chosen because it allows researchers to measure changes in online gaming addiction levels before and after administering an intervention, the Ifdil Perceptual Light Technique (IPLT). By comparing pretest and posttest scores, this design can directly identify the effectiveness of the intervention in a natural context without the manipulation of a control group (Mamuaya et al., 2025; Yunitri et al., 2024). This approach is considered appropriate because the study aims to observe specific behavioral changes resulting from treatment administered over a relatively short period of time.

Population and Participants

The population in this study were adolescents living in the Mulya Tarai Gading Housing Complex in Kampar Regency who have a habit of playing online games. Based on the results of initial observations and the distribution of screening instruments, 100 adolescents were identified who actively play online games, with varying levels of playing intensity. However, not the entire population was selected as experimental subjects. Participants were selected selectively, considering characteristics relevant to the research objectives. From the initial screening results, six adolescents were selected who met the criteria as research subjects, namely:

1. Have a moderate to high level of online gaming addiction
2. Shows difficulty in controlling the duration of play
3. Experiencing negative impacts on academic, social, or emotional aspects
4. Willing to participate in the entire series of research interventions

In this case, the 6 participants were individuals who specifically needed intervention, thus aligning with the research objectives which focused on the effectiveness of IPLT in reducing online gaming addiction.

Sampling Techniques

The sampling technique in this study used purposive sampling, a technique for selecting samples based on specific criteria established by the researcher. This technique was chosen because the study did not aim to generalize to the entire population, but rather to test the effectiveness of the intervention on a specific group, namely adolescents with significant levels of online gaming addiction (Yuliani & Supriatna, 2023; Yulianti et al., 2024). The relatively small sample size (n = 6) is not a weakness, but rather part of a preliminary experimental study strategy that focuses on the depth of intervention and intensive individual change. In the context of psychological intervention research, a limited sample size allows researchers to provide more controlled, in-depth, and focused treatment to each participant, allowing for more accurate and detailed observation of the changes that occur.

Research Instruments

The main instrument used in this study is an online game addiction scale which is compiled based on indicators of addictive behavior, such as:

- loss of control in playing
- increased playing time
- priority to games over other activities
- negative impact on daily life

The instrument uses a Likert scale with multiple answer choices indicating the respondent's level of agreement with the statement. A total score is obtained by summing all items, with higher scores indicating higher levels of addiction. The validity of the instrument was tested through content validity by guidance and counseling experts, while reliability was tested using the Cronbach's alpha coefficient to ensure the internal consistency of the instrument (Yuliani & Supriatna, 2023).

Research Procedures

The research was carried out through several systematic stages, namely:

1. Pretest Stage
   All participants were given an online gaming addiction scale to measure baseline levels of addiction before the intervention.
2. Intervention Phase (IPLT)
   Participants participated in an intervention session using the Ifdil Perceptual Light Technique (IPLT), delivered in stages over several sessions. This intervention aimed to modify visual

perception and emotional responses associated with addictive behaviors related to online gaming.

3. Posttest Stage
   After all intervention sessions were completed, participants were again given the same scale to measure changes in addiction levels.

This procedure is designed to ensure that the changes that occur can be directly attributed to the intervention provided.

Data Analysis Techniques

Data analysis was conducted using a quantitative statistical approach. The analysis stages include:

1. Descriptive Analysis
   To describe the distribution of pretest and posttest scores.
2. Assumption Test (Normality)
   To ensure that the data meets the requirements for parametric analysis.
3. Hypothesis Testing (Paired Sample t-test)
   Used to test for significant differences between scores before and after intervention.
4. Effect Size (Cohen's d)
   To determine the extent of the influence of IPLT intervention on reducing online game addiction.

This analysis allows researchers to see not only the statistical significance, but also the practical meaning of the changes that occur (Mamuaya et al., 2025).

Results and Discussions

This study aimed to test the effectiveness of the Ifdil Perceptual Light Technique (IPLT) as a visual intervention in reducing online gaming addiction in adolescents. Data were obtained through pretest and posttest measurements of six respondents selected based on moderate to high addiction criteria.

Descriptive Analysis

The descriptive analysis results showed a clear difference between online gaming addiction scores before and after the intervention. Summary statistics are presented in Table 1.

Table 1. Descriptive Statistics of Pretest and Posttest

Statistics	Pretest	Posttest
N	6	6
Mean	42.33	26.33
Median	42.50	26.50
Standard Deviation	1.37	0.82
Minimum	41	25
Maximum	44	27
Range	3	2

Based on Table 1, the average online gaming addiction score decreased from 42.33 to 26.33, with an average difference of 16 points. This decrease indicates substantial change after the IPLT intervention. The small standard deviation indicates that the changes occurred consistently across all respondents.

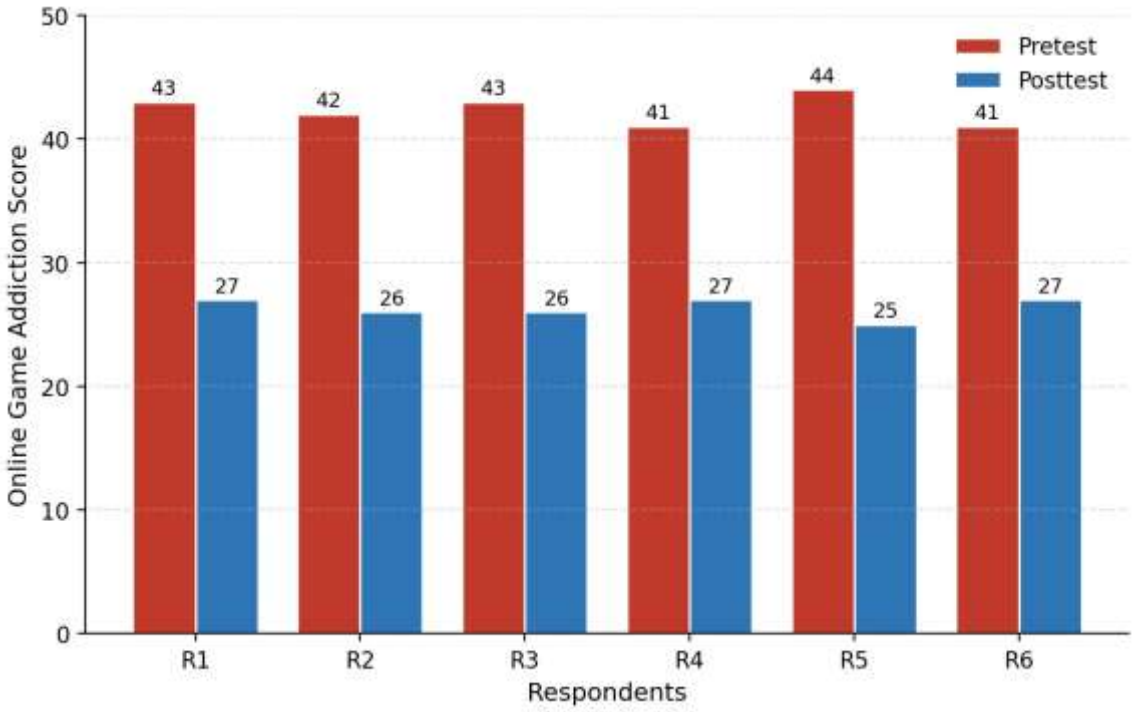

Figure 1.Visualization of Change

The graph shows a significant and consistent decline across all respondents, with no increase in scores for any individual.

Gain Score Analysis

Table 2. Respondents' Gain Score

Respondents	Pretest	Posttest	Gain
R1	43	27	16
R2	42	26	16
R3	43	26	17
R4	41	27	14
R5	44	25	19
R6	41	27	14

The average gain of 16 points indicates that all respondents experienced a consistent reduction in addiction.

Normality Test

Table 3. Normality Test (Shapiro-Wilk)

Variables	N	Sig.	Information
Pretest	6	0.200	Normal
Posttest	6	0.200	Normal

A significance value > 0.05 indicates that the data is normally distributed and meets the assumptions of parametric analysis.

Hypothesis Testing (Paired Sample t-test)

Table 4. t-Test Results

Variables	Mean	SD	T	df	Sig.
Pretest	42.33	1.37	28.41	5	0.000
Posttest	26.33	0.82			

The test results showed a significance value of $p < 0.05$, indicating a significant difference between the pretest and posttest scores. Thus, IPLT has been proven effective in reducing online gaming addiction.

Effect Size (Cohen's d)
To determine the magnitude of the influence of the IPLT intervention, the effect size calculation was carried out using the Cohen's d formula:

$$d = \frac{\bar{X}_{pre} - \bar{X}_{post}}{SD_{pooled}}$$

Dengan:

- Mean pretest = 42.33
- Mean posttest = 26.33
- Mean difference = 16.00
- SD pooled ≈ 1.12

Sehingga diperoleh:

$$d = \frac{16}{1.12} = 14.28$$

Table 5. Interpretation of Effect Size

Value d	Interpretation
14.28	Very large effect

The Cohen's d value of 14.28 indicates that IPLT has a very strong effect on reducing online gaming addiction. This value far exceeds the limit for a large effect size (0.80), thus indicating a very significant intervention impact in practice. The results of this study indicate that IPLT is effective in reducing online gaming addiction in adolescents. The significant and consistent reduction in scores, supported by a very large effect size, indicates that this intervention has high power in changing addictive behavior. Online gaming addiction is a form of behavioral addiction influenced by intense visual stimuli and the brain's reward system (Limone et al., 2023; Nursalam et al., 2023). Exposure to these stimuli triggers the release of dopamine, which causes dependence (Ministry of Health of the Republic of Indonesia, 2018; Hartanti, 2022).

IPLT works through light-based visual stimulation that can influence an individual's perceptual and emotional systems (Ifdil et al., 2019). By working on the same pathways as online games, IPLT can alter psychological responses to visual stimuli, thereby reducing dependency. These findings are also supported by research showing that visual interventions are effective in modifying behavior and cognition (Fadhilah et al., 2022; Siagian et al., 2010). Furthermore, improved self-regulation suggests that IPLT can strengthen an individual's self-control (Kaya et al., 2024). Socially, online game addiction has an impact on decreased social interaction, aggressiveness, and academic achievement (Budiawan et al., 2024; Sun et al., 2023; Hidayat et al., 2022). Therefore, reducing addiction through IPLT has the potential to improve adolescents' psychological well-being. Although the results show a significant effect, limitations of this study lie in the small sample size and the absence of a control group. However, the consistency of the results and the large effect size indicate that IPLT has very strong potential as an intervention.

Conclusions

This study aims to test the effectiveness of Ifdil Perceptual Light Technique (IPLT) as a visual intervention in reducing online game addiction in adolescents, and based on the results of descriptive and inferential analysis, it was found that there was a significant decrease in the level of addiction after the intervention was given, where the average addiction score decreased from 42.33 in the pretest to 26.33 in the posttest with a difference of 16 points, supported by the results of the paired sample t-test which showed a significance value of $p < 0.05$ and an effect size value (Cohen's d) of 14.28 which is included in the very large effect category, thus confirming that IPLT is not only statistically significant but also has a very strong practical impact; In addition, the consistent decrease in scores across all respondents indicates that this intervention is effective at both the individual and group levels, which can be conceptually explained through IPLT's ability to modify the visual perception system and emotional responses that underlie addictive behavior towards online games, so that by working on the same visual stimulus pathway as games but in a therapeutic form, IPLT is able to reduce dependence while increasing self-control and emotional regulation in adolescents, and thus it can be concluded that Ifdil Perceptual Light Technique (IPLT) is an effective, significant intervention and has a high power of influence in reducing online game addiction in adolescents and provides an important contribution in the development of a visual-based counseling approach that is relevant to the challenges of the digital era.

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