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Brief cognitive behavior group counseling using cognitive restructuring, and problem-solving techniques to improve students' digital well-being

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Article Info	Abstract
Keywords: Brief cognitive behavior group counseling, cognitive restructuring, problem solving, digital well-being.	Digital well-being has become an important concern among adolescents due to their increasing engagement with digital technologies. This study aimed to compare the effectiveness of brief cognitive behavioral group counseling using cognitive restructuring and problem-solving techniques in improving digital well-being among Grade 10 students at SMA Negeri 12 Semarang, Indonesia. A two-group pretest–posttest design with a two-week follow-up was employed, involving 20 students divided into cognitive restructuring and problem-solving groups. Each group participated in five counseling sessions lasting 90 minutes each. Digital well-being was assessed using the Digital Well-Being Scale (DWBS), and data were analyzed using mixed-design analysis of variance (ANOVA). The results revealed a significant main effect of time, $F(2, 36) = 115.684, p < .001, \eta^2 = .865$, with overall mean scores increasing from 32.60 at pretest to 47.80 at posttest and 50.40 at follow-up. However, neither the group effect, $F(1, 18) = 0.003, p = .955$, nor the time $\times$ group interaction, $F(2, 36) = 0.117, p = .890$, was statistically significant. These findings indicate substantial improvements in digital well-being across both intervention groups, with improvements maintained at the two-week follow-up. Both techniques represent promising approaches for supporting students' digital well-being through school-based group counseling, although no significant difference in their outcomes was detected.

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Introduction

Advances in digital technology in the modern era have had a major impact on various aspects of human life. Hussain, (2025) explains that technological developments provide broad opportunities for individuals to share information, expand the economic sector, and increase social interaction through social networking platforms such as Facebook, Instagram, TikTok, and Twitter. In line with this, Ishmah Syafi'ulloh & Husni, (2026) emphasize that digital media not only facilitates communication but also accelerates access to information, which has the potential to increase student motivation and the quality of education in Indonesia Sofia Annisa Rahma et al., (2025)

However, despite the various conveniences offered by technology, its excessive and uncontrolled use can have negative consequences. Sun & Chao, (2024) revealed that adolescents who use digital media excessively are at risk of addiction, sleep disorders, decreased concentration, and mental health problems. Kurniasanti et al., (2019) reinforced these findings by reporting that adolescents are the largest group of internet users in Indonesia, with the majority spending their time on social media and online games. Meta-analytic studies also show that problematic internet use Cai et al., (2023) and social media addiction Duradoni et al., (2020) are negatively correlated with individual well-being. These negative impacts can even develop into depression, anxiety, and even suicide risk (Cen et al., 2024; Shen et al., 2020) .

Based on data from the Central Statistics Agency (BPS), the highest number of internet users in 2023 will be at the high school level, with a percentage of 32.62%, while at the junior high school level it will be 22.19%. Therefore, understanding the concept of digital wellbeing as an effort to maintain a balance between the benefits of technology and its negative impacts on life, especially for the younger generation, is a positive and important

critical attitude for teenagers so that they can live a more balanced and healthy life in the digital era (healthy and balanced life).

Digital well-being is defined as an individual's ability to use technology in a healthy and balanced manner, so that it provides benefits without causing disruption (Burr et al., 2020; Gui et al., 2017). This concept includes managing screen time, controlling distractions, maintaining personal data security, and emotional skills in digital interactions (Vanden Abeele & Mohr, 2021). Research Twenge & Campbell, (2019) confirms that low digital well-being correlates with increased stress, anxiety, and decreased academic achievement. Conversely, good digital well-being enables students to lead productive, safe, and meaningful digital lives.

Low digital well-being among students can be influenced by various factors, including excessive use of digital media and a lack of skills in managing digital interactions. This is in line with the principles of Cognitive Behavioral Therapy (CBT). Cognitive Behavioral Therapy (CBT) and digital well-being are closely related, especially in the context of using digital technology to improve mental health. Cognitive behavior therapy is a psychotherapeutic approach that focuses on changing maladaptive thoughts and behaviors, including digital addiction or other mental health-related problems, while digital well-being relates to how the use of digital technology affects an individual's mental health and well-being. Research by Ambike et al., (2023) states that cognitive behavioral therapy is the primary modality in the treatment of screen addiction. Cognitive behavioral therapy can help individuals identify and change maladaptive thought patterns that contribute to digital addiction. In addition, research by Pihlaja et al., (2018) mentions that cognitive behavioral therapy can help reduce social anxiety.

Brief Cognitive Behavior is a condensed form of traditional Cognitive Behavior Therapy (CBT) that focuses on specific problems Bond et al., (2002) While CBT generally lasts 10–20 sessions, brief cognitive behavior is shortened to 4–8 sessions, making it more practical and maintaining the motivation of the client (Wright et al., 2010). The short duration encourages active participation, learning responsibility, and the client's readiness to make cognitive and behavioral changes (Lang & Craske, 2000). Research by Bramoweth et al., (2020) confirms that such brief and flexible interventions increase access to services, even in non-clinical contexts. Brief cognitive behavior therapy is effective in changing maladaptive thinking patterns into more positive and constructive ones (Hofmann et al., 2012).

In this study, two main techniques were used, namely Cognitive Restructuring (CR) and Problem Solving (PS). Cognitive Restructuring focuses on restructuring irrational thoughts into rational, realistic, and adaptive thinking patterns (Takdir et al., 2025). (Rahmatillah & Setiawati, 2020) proved the effectiveness of this technique in reducing online game addiction among students. Meanwhile, Problem Solving emphasizes skills in defining problems, designing alternative solutions, choosing strategies, and evaluating the results of the solution (Nezu et al., 2013). Sriyanto et al., (2025) found that these skills are effective in improving the social interaction of students who use smartphones.

Furthermore, Veisi et al., (2024) show that good problem solving allows individuals to develop effective coping strategies, which in turn can improve mental well-being, while Dienlin & Johannes, (2020) emphasize the importance of this ability in improving digital well-being. Thus, both Cognitive Restructuring and Problem Solving have great potential in helping students manage their use of digital technology in a healthier way.

Although previous studies have tested the effectiveness of each technique, studies that directly compare the effectiveness of Cognitive Restructuring and Problem Solving in the context of students' digital well-being are still very limited. Therefore, this study focuses on comparing the effectiveness of the two techniques. The results of this study are expected to contribute theoretically to the development of cognitive-behavioral counseling interventions, as well as provide practical implications for school counseling services in shaping a healthy, responsible, and adaptive younger generation in facing the challenges of the digital era.

Method

The research subjects were selected from 10th grade students at Semarang State High School 12 through a purposive random sampling procedure based on inclusion criteria. The inclusion criteria were set for students who attended Semarang State High School 12, were in 10th grade, had low to moderate digital well-being, were willing to participate in the full group counseling program as evidenced by informed consent, and were motivated to improve their digital well-being. Based on the results of the instrument trial and initial measurement (pretest), 20 students who met the criteria were obtained and then randomly assigned to two intervention groups. Experimental group I consisted of 10 students who received brief cognitive behavior group counseling intervention with cognitive restructuring techniques, while experimental group II consisted of 10 students who received brief cognitive behavior group counseling intervention with problem-solving techniques.

This instrument uses a standardized measurement tool, namely the DWBS (Digital Well-Being Scale) developed by (ARSLANKARA et al., 2022). This scale was adapted to the research context through translation

from English to Indonesian, language suitability testing (back translation), and content validation by experts to ensure item comprehensibility and cultural context suitability. The scale consists of 12 items with valid items having a correlation range of 0.393 to 0.643 and a reliability of 0.791. This instrument contains three main indicators, namely (1) digital satisfaction, (2) safe and responsible behavior, and (3) digital wellness. The scale options for each item use a Likert model with a range from not reflecting at all (1) to reflecting completely (5).

The experimental design and procedure used a randomized 2-factor pretest–multiple posttest group design involving two experimental groups with similar characteristics. In this design, both groups were given a pretest using the same digital well-being instrument. Experimental group I was given special treatment in the form of brief cognitive behavior group counseling using cognitive restructuring techniques for five sessions, each lasting 2x45 minutes. The first session was an introduction to the problem, the second session was the identification of automatic thoughts, the third session was the evaluation of the validity of thoughts, the fourth session was replacing them with rational thoughts, and the fifth session was the application and evaluation.

Meanwhile, experimental group II received brief cognitive behavior group counseling using problem-solving techniques, which also consisted of five sessions, each lasting 2x45 minutes. The first session was problem identification, the second session was problem analysis and alternative solution search, the third session was alternative evaluation, the fourth session was solution selection and implementation, and the fifth session resulted evaluation and follow-up.

After the treatment was given to both groups, a posttest was administered using the same instrument to measure changes in digital well-being levels before and after treatment. A follow-up test was then conducted two weeks after the intervention to assess the sustainability of its effects. The test results were compared between the pretest, posttest, and follow-up for each group, as well as between groups, to determine the effectiveness of the intervention.

Data analysis techniques used mixed analysis of variance (Mixed-ANOVA) with the help of SPSS version 26 to determine the differences in digital well-being scores before and after treatment in each group, differences in effectiveness between intervention groups, and interactions between measurement time and type of intervention.

Results and Discussion

Based on descriptive analysis, it shows that the initial digital well-being conditions of both groups were in the low and moderate categories. After the intervention, the scores increased significantly in the posttest to the high category and remained so at follow-up, confirming the sustainability of the intervention effect. Details of the descriptive statistical analysis are presented in Table 1.

Table 1. Descriptive Statistical Analysis

Time	Group	<i>M</i>	Elementary	<i>N</i>
T1	KCR	32.50	3.408	10
	KPS	32.70	4.347	10
	Total	32.60	3.803	20
T2	KCR	48.10	4.508	10
	KPS	47.50	4.378	10
	Total	47.80	4.336	20
T3	KCR	50.10	3.635	10
	KPS	50.70	4.596	10
	Total	50.40	4.044	20

Description: KCR (Cognitive Restructuring Group), KPS (Problem-Solving Group), *M* (Mean), *SD* (Standard Deviation), *N* (Number)

Furthermore, the results of the Mixed ANOVA analysis show changes in digital well-being scores based on the measurement time, differences between intervention groups, and the interaction between the two. The analysis results are shown in Table 2.

Table 2. Mixed ANOVA Analysis Results

Source	<i>df</i>	<i>F</i>	<i>P-value</i>
Phase (Within)	2	115.684	< 0.001
Group (Between)	1	0.003	0.955
Interaction	2	0.117	0.890

The results of the mixed ANOVA showed a significant main effect of time on students' digital well-being scores, $F(2,36) = 115.684$, $p < .001$, $\eta p^2 = .865$. This means that there was a consistent increase in digital well-

' well-being scores from the pretest to the posttest and persisted until the follow-up. Analysis of each group, both cognitive restructuring and problem solving, showed a significant increase in digital well-being over time. In the cognitive restructuring group, a significant difference in scores was seen with $F(2,18) = 60.791$, $p < 0.001$, where the average score increased from $M = 32.50$ ($SD = 3.41$) in the pretest to $M = 48.10$ ($SD = 4.51$) in the posttest, and $M = 50.10$ ($SD = 3.64$) in the follow-up. In the problem-solving group, $F(2,18) = 55.254$, $p < 0.001$, indicating an increase from $M = 32.70$ ($SD = 4.35$) on the pretest to $M = 47.50$ ($SD = 4.38$) on the posttest, and $M = 50.70$ ($SD = 4.60$) on the follow-up. Thus, brief cognitive behavior group counseling using cognitive restructuring and problem-solving techniques are equally effective in improving students' digital well-being, and the positive effects persist after the intervention.

However, no significant difference was found between brief cognitive behavior counseling using cognitive restructuring techniques and brief cognitive behavior counseling using problem-solving techniques ($F(1,18) = 0.003$, $p = .955$, $\eta^2 = .000$). This means that the effectiveness of both techniques is relatively the same, with no technique being superior to the other. The effect of this group difference is very small. In addition, there was no time $\times$ group interaction effect ($F(2,36) = 0.117$, $p = .890$, $\eta^2 = 0.006$). The increase in digital well-being scores from the pretest to the follow-up was parallel in both groups. In other words, both the Cognitive Restructuring and Problem-Solving techniques produced positive results, but with similar patterns of change.

This study aims to examine the effectiveness of brief cognitive behavior group counseling using cognitive restructuring and problem-solving techniques in improving the digital well-being of 10th grade students at SMA Negeri 12 Semarang. The results of the analysis show that both techniques are equally effective in improving digital well-being. Theoretically, cognitive restructuring focuses on changing irrational automatic thoughts into more rational and adaptive ones (Takdir et al., 2025). These findings are in line with the research by Rahmatillah & Setiawati, (2020) which confirm that cognitive restructuring is effective in reducing problematic digital behavior and improving self-control and self-regulation, which are among the foundations of digital well-being.

Meanwhile, Problem Solving emphasizes the ability to define problems, generate alternative solutions, evaluate, and apply solutions adaptively (Nezu et al., 2013). These findings are consistent with the research by Sriyanto et al., (2025), which proves the effectiveness of problem solving in improving the social interaction of smartphone users. Furthermore, Veisi et al., (2024) and Dienlin & Johannes, (2020) emphasize the positive relationship between problem solving and digital well-being. In practice, problem solving helps students deal with social media distractions, FOMO, and procrastination through concrete strategies such as blocking study time, turning off notifications, and keeping devices out of reach.

The comparison of results shows that although there is no statistically significant difference, both techniques are equally effective. Cognitive restructuring emphasizes changing maladaptive thinking patterns that trigger digital stress, while problem solving helps students develop practical strategies for dealing with everyday digital problems. The two complement each other in supporting students' digital well-being. Practically speaking, the results of this study confirm that school counselors can use both cognitive restructuring and problem-solving techniques in group counseling services, as both have been proven to improve digital well-being in a balanced and sustainable manner.

Conclusion

This study examined the effects of brief cognitive behavior group counseling using cognitive restructuring and problem-solving techniques on improving digital well-being among students at State Senior High School 12 in Semarang. The results showed that both intervention techniques were equally effective in improving students' digital well-being, both at the posttest and follow-up stages. This was demonstrated by a consistent increase in digital well-being scores over time, although no significant difference was found between the cognitive restructuring and problem-solving groups. The effectiveness testing in this study focused on maladaptive cognitive changes through thought restructuring in the cognitive restructuring technique, as well as strengthening systematic problem-solving skills in the problem-solving technique. Both approaches were proven to contribute to increased digital satisfaction, safe and responsible digital behavior, and students' digital health. However, this study has limitations, such as a small sample size, a homogeneous population consisting only of high school students, and a short observation period. Therefore, further studies involving a larger sample size, a more diverse population, and long-term observation are recommended in order to obtain more representative and comprehensive results.

Author Contributions Statement

Nurul Khoiriyah was responsible for developing the research concept, designing the methodology, conducting the intervention, collecting and analyzing the data, and preparing the initial manuscript. **Mulawarman** contributed to research supervision, methodological consultation, and critical evaluation of the manuscript. **Ernest Ceti Septyanti** contributed to academic supervision, validation of the research process, and manuscript review and revision. All authors reviewed and approved the final manuscript for publication.

Declaration of Generative AI

Generative artificial intelligence, specifically ChatGPT, was used to assist in refining the language and improving the clarity of the manuscript. The authors carefully reviewed the generated suggestions and retained responsibility for the accuracy, originality, and integrity of the final published work.

Declaration of Competing Interest

The authors declare that they have no financial or personal relationships that could be perceived as presenting a conflict of interest in relation to the research, its findings, or the publication of this article.

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