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The Effectiveness of Group Counseling Using the Behavior Contract Technique in Reducing Gadget Addiction and Improving Academic Self-Regulation among Students

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ABSTRACT

This study aimed to examine the effectiveness of group counseling using a behavioral approach with a behavior contract technique in reducing gadget addiction and improving academic self-regulation among vocational high school students. The research employed a quasi-experimental design with a pretest–posttest control group design. Participants were 40 students selected through purposive sampling and divided into experimental and control groups. Data were collected using a gadget addiction scale and an academic self- regulation scale. The results indicated that descriptively, the experimental group showed greater improvement compared to the control group. However, the independent sample t- test revealed that the difference was not statistically significant at the 0.05 level. Despite this, the positive trend suggests that group counseling with behavior contract techniques has potential as an intervention strategy in school counseling services to address gadget addiction and enhance students' academic self-regulation.

ABSTRAK

Penelitian ini bertujuan untuk menguji efektivitas konseling kelompok dengan pendekatan behavioristik melalui teknik behavior contract dalam menurunkan kecanduan gadget dan meningkatkan academic self-regulation pada siswa Sekolah Menengah Kejuruan (SMK). Penelitian ini menggunakan desain quasi-eksperimental dengan model pretest–posttest control group design. Partisipan penelitian berjumlah 40 siswa yang dipilih melalui teknik purposive sampling dan dibagi ke dalam kelompok eksperimen dan kelompok kontrol. Data dikumpulkan menggunakan skala kecanduan gadget dan skala academic self-regulation. Hasil penelitian menunjukkan bahwa secara deskriptif, kelompok eksperimen mengalami peningkatan yang lebih besar dibandingkan kelompok kontrol. Namun, berdasarkan uji independent sample t-test, perbedaan tersebut tidak signifikan secara statistik pada taraf 0,05. Meskipun demikian, adanya tren positif menunjukkan bahwa konseling kelompok dengan teknik behavior contract memiliki potensi sebagai strategi intervensi dalam layanan bimbingan dan konseling di sekolah untuk mengatasi kecanduan gadget serta meningkatkan academic self-regulation siswa.

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1. Pendahuluan

Adolescent life, particularly in the use of smartphones as a means of communication, entertainment, and learning, has become increasingly prominent. However, excessive and uncontrolled use has the potential to lead to gadget addiction, which negatively impacts students' academic, psychological, and social aspects. Various international studies indicate that the prevalence of smartphone addiction among adolescents is at an alarming level, reaching 20–35% of the student population (Kim et al., 2022; Picot et al., 2025). A meta-analysis conducted by Li et al. (2025) reported that smartphone addiction has a significant negative effect on students' cognitive functioning and academic engagement, with moderate to large effect sizes. These findings emphasize that gadget addiction is a serious issue that requires attention in the context of education and school counseling services.

One of the main consequences of gadget addiction is the decline in students' academic self-regulation abilities. Academic self-regulation includes students' ability to plan, monitor, and evaluate their learning processes independently. Research by Wang et al. (2023) shows that self-control and self-regulation contribute significantly to smartphone addiction tendencies, with a contribution value exceeding 40%. Kim et al. (2022) also found that students with low self-control are at higher risk of gadget addiction compared to those with good self-regulation. In addition, Caplan (2021) emphasizes that failure in academic self-regulation makes it difficult for students to control the duration of gadget use, leading to procrastination and decreased academic performance. Therefore, academic self-regulation is an important variable that needs to be improved in efforts to address gadget addiction.

Recent studies highlight the importance of behavior-based psychological interventions in reducing gadget addiction among adolescents. A meta-analysis by Zhang et al. (2023) on experimental studies shows that non-pharmacological behavioral and cognitive interventions are effective in reducing internet and smartphone addiction, with high effect sizes. Li et al. (2023) also reported that structured behavioral interventions significantly reduced smartphone addiction scores in the experimental group compared to the control group. These findings are reinforced by Spada (2020), who states that behavioral approaches are effective because they directly target maladaptive habits and reinforcement mechanisms that sustain addictive behavior. Therefore, behavioral approaches are recommended strategies in school counseling services.

In the context of guidance and counseling services, group counseling is considered an effective form of intervention in addressing behavioral problems among adolescents. Group counseling provides students with opportunities to learn through group dynamics, social support, and modeling of adaptive behavior. Research by Kim and Kim (2020) shows that behavior-based group counseling significantly reduces adolescent internet addiction after several intervention sessions. Liu et al. (2021) also found that group therapy improves self-control and academic compliance among adolescents with internet addiction. These findings indicate that group counseling has advantages in creating more sustainable behavioral changes compared to individual interventions, especially in school settings.

The behavioristic approach in group counseling emphasizes observable behavior change through principles of reinforcement, habituation, and stimulus control. One commonly used technique in this approach is the behavior contract, which is a written agreement between the counselor and the client regarding behavioral targets, reinforcement forms, and agreed consequences. Hofmann et al. (2020) state that improvements in executive function

and self-control play an important role in the success of controlling addictive behavior. In addition, Young and Brand (2020) emphasize that behavior contract techniques are effective in increasing individuals' commitment to behavior change. Thus, the behavior contract technique has great potential to be used in group counseling to reduce gadget addiction and improve students' academic self-regulation.

Although various international studies have proven the effectiveness of group counseling and behavioristic approaches in addressing gadget addiction, research specifically examining the implementation of behavioristic group counseling with behavior contract techniques among vocational high school (SMK) students is still limited, especially in the Indonesian educational context. In fact, Zhang et al. (2025) show that vocational students tend to have higher levels of smartphone addiction compared to students in general academic tracks, which impacts lower self-regulation and learning motivation. Therefore, this study is important to examine the effectiveness of behavioristic group counseling with behavior contract techniques in reducing gadget addiction and improving academic self-regulation among vocational high school students.

2. METHOD

Design

This study employed a quantitative approach with a quasi-experimental design in the form of a pretest–posttest control group design. This design was chosen because it allows researchers to test the effectiveness of an intervention by comparing score changes before and after treatment between the experimental and control groups. Quasi-experimental designs are widely recommended in guidance and counseling research in school settings due to limitations in fully randomizing subjects (Zhang et al., 2023; Li et al., 2025).

Participants

Participants in this study were students of SMK Buay Madang who demonstrated moderate to high levels of gadget addiction based on initial screening results. A purposive sampling technique was used to select participants who met the inclusion criteria. The selected participants were then assigned to either the experimental group or the control group. All participants agreed to take part in the study and completed all research procedures.

Instrument

The instruments used in this study consisted of two psychological scales: a gadget addiction scale and an academic self-regulation scale. The gadget addiction scale was developed based on indicators of excessive use, loss of control, and negative impacts of gadget use, which have been widely used in international research (Kim et al., 2022). The academic self-regulation scale refers to the dimensions of planning, monitoring, and evaluation of learning, as proposed in Caplan (2021) and Wang et al. (2023). Both instruments had undergone validity and reliability testing before being used in the main study.

Data Analysis

Data analysis was conducted in stages using inferential statistics. The data were first tested through prerequisite analysis, including normality and homogeneity tests. Furthermore, to determine the effectiveness of behavioristic group counseling with behavior contract techniques, differences in pretest and posttest scores between the experimental and control groups were analyzed using a t-test or other relevant nonparametric statistical tests. Additionally, effect size calculations were performed to determine the magnitude of the intervention's impact on reducing gadget addiction and improving academic self-regulation. This analysis technique aligns with recommendations for behavioral intervention research in educational and counseling contexts (Zhang et al., 2023).

This study involved 20 students of SMK Buay Madang, consisting of 10 students in the experimental group and 10 students in the control group. All participants were selected based on initial screening results indicating moderate to high levels of gadget addiction. The study was conducted using a quasi-experimental design with a pretest–posttest control group model, allowing researchers to compare score changes before and after the intervention in both groups. In the initial stage, all participants were given a pretest to measure levels of gadget addiction and academic self-regulation. The experimental group then received an intervention in the form of group counseling using a behavioristic approach through behavior contract techniques, while the control group did not receive any special treatment and continued regular learning activities. After all intervention sessions were completed, both groups were given a posttest to determine the changes that occurred. The results of the data analysis in this section are presented step by step, starting from descriptive statistics, prerequisite tests (normality and homogeneity), to hypothesis testing using an independent sample t-test. This presentation aims to provide a comprehensive overview of the effectiveness of group counseling with behavior contract techniques in reducing gadget addiction and improving students' academic self-regulation.

3. RESULT AND DISCUSSION

Penelitian ini melibatkan 20 siswa SMK Buay Madang yang terdiri atas 10 siswa pada kelompok eksperimen dan 10 siswa pada kelompok kontrol. Seluruh partisipan dipilih berdasarkan hasil screening awal yang menunjukkan tingkat kecanduan gadget pada kategori sedang hingga tinggi. Penelitian dilaksanakan menggunakan desain quasi- eksperimental dengan model pretest–posttest control group design, sehingga memungkinkan peneliti membandingkan perubahan skor sebelum dan sesudah intervensi pada kedua kelompok. Pada tahap awal, seluruh peserta diberikan pretest untuk mengukur tingkat kecanduan gadget dan academic self-regulation. Selanjutnya, kelompok eksperimen memperoleh intervensi berupa konseling kelompok dengan pendekatan behavioristik melalui teknik behavior contract, sedangkan kelompok kontrol tidak diberikan perlakuan khusus dan mengikuti kegiatan pembelajaran seperti biasa. Setelah seluruh sesi intervensi selesai dilaksanakan, kedua kelompok diberikan posttest untuk mengetahui perubahan yang terjadi. Hasil analisis data dalam bagian ini disajikan secara bertahap, dimulai dari statistik deskriptif, uji prasyarat analisis (normalitas dan homogenitas), hingga uji hipotesis menggunakan independent sample t-test. Penyajian hasil ini bertujuan untuk memberikan gambaran komprehensif mengenai efektivitas konseling kelompok dengan teknik behavior contract terhadap penurunan kecanduan gadget dan peningkatan academic self-regulation siswa.

Based on the results of the descriptive statistical analysis, the number of samples in both the control class and the experimental class was 20 students each (N = 20). The data analyzed included pretest and posttest scores in both groups.

In the control class, the pretest scores had a mean of 73.60 with a standard deviation of 9.428. The minimum score recorded was 55 and the maximum was 90, with a score range of 35. After the treatment, the posttest scores in the control class increased to a mean of 76.60 with a standard deviation of 8.593. The minimum score increased to 60 and the maximum to 92, with a score range of 32. This indicates an improvement in learning outcomes of 3.00 points in the control class. Meanwhile, in the experimental class, the pretest scores showed a mean of 77.40 with a standard deviation of 8.696. The minimum and maximum scores were 60 and 90, respectively, with a score range of 30. After the treatment, the mean posttest score increased to 81.30 with a standard deviation of 8.240. The minimum score increased to 65 and the maximum to 95, while the score range remained 30. The average improvement in the experimental class was 3.90

points. In general, both groups experienced an increase in scores after the treatment. However, the improvement in the experimental class was higher than in the control class. In addition, the decrease in standard deviation in both groups indicates that the variation in students' scores after learning became more homogeneous. Thus, descriptively, it can be concluded that the treatment given to the experimental class had a better impact on learning outcomes compared to the control class

Based on Table 3, the number of respondents in both the control class and the experimental class was 20 students each (N = 20). The descriptive statistics presented include pretest and posttest scores of academic self-regulation in both groups. In the control class, the pretest results showed a mean score of 75.60 with a standard deviation of 9.428 and a variance of 88.884. The minimum score recorded was 55 and the maximum score was 90, with a range of 35. After the treatment, the posttest mean increased to 76.60 with a standard deviation of 8.593 and a variance of 73.832. The minimum score increased to 60 and the maximum to 92, with a range of 32. This indicates an average increase of 1.00 point in the control class. Meanwhile, in the experimental class, the pretest scores showed a mean of 77.40 with a standard deviation of 8.696 and a variance of 75.621. The minimum and maximum scores were 60 and 90, respectively, with a range of 30. After the treatment, the posttest mean increased to 81.30 with a standard deviation of 8.240 and a variance of 67.905. The minimum score increased to 65 and the maximum to 95, while the range remained 30. The average increase in the experimental class was 3.90 points.

Descriptively, both groups experienced an increase in academic self-regulation after the treatment. However, the improvement in the experimental class was greater than that in the control class. In addition, the decrease in standard deviation in both groups indicates that the variation in scores after the treatment became more homogeneous. Therefore, it can be concluded that the treatment given to the experimental class tends to have a better impact on improving academic self-regulation compared to the control class.

The normality test in this study was conducted using the Kolmogorov–Smirnov and Shapiro–Wilk tests. This test aims to determine whether the pretest and posttest data in the control and experimental classes are normally distributed as one of the prerequisites for parametric statistical analysis. Based on the results of the Kolmogorov–Smirnov test, the significance value for all data groups was 0.200 (p > 0.05). This value represents the lower bound of significance with Lilliefors correction. This indicates that the pretest and posttest data in both the control and experimental classes are normally distributed. The results of the Shapiro–Wilk test also showed significance values of 0.812 for the control class pretest, 0.797 for the control class posttest, 0.446 for the experimental class pretest, and 0.791 for the experimental class posttest. All of these significance values are greater than 0.05 (p > 0.05), indicating that the data in each group are normally distributed. Thus, based on both normality tests, all pretest and posttest data in the control and experimental classes meet the assumption of normality. Therefore, parametric statistical analysis can be used for subsequent hypothesis testing.

The homogeneity of variance test was conducted to determine whether the variances of the data in the control and experimental classes were equal (homogeneous). This test used Levene's Test as one of the prerequisites for parametric statistical analysis, particularly the t-test. Based on the results of Levene's Test, the significance value obtained was 0.766 when calculated based on the mean. This significance value is greater than 0.05 (p > 0.05), indicating that the variances of the two groups are homogeneous. The same result is also shown in calculations based on the median, median with adjusted degrees of freedom, and trimmed mean, all of which yielded a significance value of 0.766.

Therefore, it can be concluded that the data in the control and experimental classes have equal variances (homogeneous).

The independent samples t-test was conducted to determine the difference in mean scores between the control class and the experimental class. Before interpreting the results of the t-test, the results of Levene's Test were first examined to assess the equality of variances. Based on Levene's Test, a significance value of 0.766 (p > 0.05) was obtained, indicating that the variances of the two groups are homogeneous. Therefore, the t-test interpretation uses the assumption of equal variances assumed.

The results of the t-test showed a t-value of -1.766 with 38 degrees of freedom (df) and a significance value (2-tailed) of 0.086. Since the significance value is greater than 0.05 (0.086 > 0.05), there is no statistically significant difference between the control class and the experimental class.

The mean difference of -4.700 indicates that the average score of the experimental class is higher than that of the control class by 4.7 points. However, the 95% confidence interval ranges from -10.089 to 0.689, which includes zero. This further confirms that the difference is not statistically significant.

Thus, it can be concluded that although descriptively the experimental class shows a higher mean compared to the control class, the difference is not statistically significant at the 5% significance level.

DISCUSSION

The results of this study indicate that, descriptively, group counseling using a behavioristic approach through the behavior contract technique led to greater improvement in the experimental group compared to the control group, both in reducing gadget addiction and increasing academic self-regulation. The average posttest score of the experimental group was higher than that of the control group; however, based on the independent samples t-test, the difference was not statistically significant (p > 0.05). These findings suggest that the intervention tends to have a positive effect, but its strength is not yet sufficient to produce a statistically significant difference at the 5% level.

Theoretically, these results are consistent with self-control and executive regulation models, which explain that addictive behaviors, including smartphone addiction, are closely related to weaknesses in self-control and executive functioning (Hofmann et al., 2020; Brand et al., 2022). Research by Wang et al. (2023) shows that self-control plays a significant role in predicting smartphone addiction among adolescents. Furthermore, Chen and Yan (2024) found that emotional dysregulation and impulsivity strengthen tendencies toward addictive smartphone behavior. Therefore, behavior-based interventions that target the formation of new habits and reinforcement of adaptive behaviors have a strong theoretical foundation.

Although the statistical test results did not show significance, the increase in scores in the experimental group supports findings from meta-analyses by Zhang et al. (2023) and Li et al. (2025), which state that non-pharmacological, behavior-based interventions are effective in reducing internet and smartphone addiction among adolescents. Spada (2020) emphasizes that behavioral approaches work by modifying reinforcement patterns that sustain addictive behavior. In this study, the behavior contract technique allowed students to set measurable behavioral targets and clear consequences, thereby increasing commitment to change (Young & Brand, 2020).

The results also show an improvement in academic self-regulation in the experimental group. This finding is consistent with Lian et al. (2020), who stated that self-regulation plays an important role in controlling smartphone use. Kim et al. (2022)

also found that students with higher levels of self-control have a lower risk of gadget addiction. Additionally, Li et al. (2024) emphasized that difficulties in emotion regulation are positively correlated with smartphone addiction. Thus, the improvement in academic self-regulation in this study indicates that the intervention not only targets the reduction of addictive behavior but also strengthens students' self-management capacity in an academic context.

In the context of group counseling, group dynamics also contribute to behavioral change. Kim and Kim (2020) reported that group counseling is effective in reducing internet addiction through social support and modeling processes. Liu et al. (2021) also found that group therapy improves self-control among adolescents with internet addiction. Interaction among group members allows students to share experiences, strengthen commitment, and build new, more adaptive behavioral norms.

However, the lack of statistical significance in this study may be influenced by several factors. First, the relatively small sample size (N = 20 per group) may limit statistical power. Second, the duration of the intervention may not have been long enough to produce stable behavioral changes. This aligns with findings by Montag et al. (2021), which suggest that changes in addictive behavior require sustained intervention and environmental support. Additionally, Anderson et al. (2021) emphasize that adolescents' internet use is strongly influenced by social and family environments, indicating that school-based interventions should be complemented by external support.

Research by Zhang et al. (2025) also shows that vocational students tend to have higher levels of smartphone addiction compared to general academic students, reinforcing the relevance of this study in the vocational school (SMK) context. Picot et al. (2025) further report that smartphone addiction is associated with the risk of other maladaptive behaviors among adolescents, highlighting the importance of preventive interventions in schools.

Overall, the results of this study reinforce previous findings that behavior-based interventions in the form of group counseling have the potential to effectively reduce gadget addiction and improve academic self-regulation. Although the results are not statistically significant, the direction of change shows a positive trend consistent with international research over the past five years (2020–2025). Therefore, the development of group counseling programs based on behavior contracts with longer durations and larger samples is recommended for future research.

4. CONCLUSION

This study aimed to examine the effectiveness of group counseling using a behavioristic approach through the behavior contract technique in reducing gadget addiction and improving academic self-regulation among vocational high school (SMK) students. The results show that, descriptively, there was an increase in scores in the experimental group compared to the control group, both in terms of reducing gadget addiction and improving academic self-regulation. The experimental group demonstrated a higher average improvement than the control group after the intervention.

However, based on the independent samples t-test results, the difference between the experimental and control groups was not statistically significant at the 5% significance level (p > 0.05). Nevertheless, the consistent direction of score improvement in the experimental group indicates that group counseling using the behavior contract technique has potential as both a preventive and curative intervention within school counseling services.

These findings suggest that a behavioristic approach in a group counseling format can help students improve self-control, commitment to behavioral change, and academic self-regulation

abilities. To obtain more optimal and statistically significant results, future research is recommended to involve larger sample sizes, longer intervention durations, and stronger support from school and family environments.

Thus, group counseling using the behavior contract technique can be recommended as an intervention strategy to reduce gadget addiction and improve students' academic self-regulation in vocational school settings.

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