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Research Article

Efficacy Of Cognitive Behaviour Therapy (CBT) In Managing Smartphone Addiction, Insomnia and Aggression Among Adolescent Boys

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ABSTRACT
Smartphones are essential in today's world for everyone, but especially for teenagers. Examining how smartphone addiction affects teenage students' sleep patterns and aggression is crucial, particularly for teenage boys. The period of growth and development between childhood and maturity is known as adolescence. Anyone between the ages of 10 and 19 is considered an adolescent by the World Health Organization (WHO). The aim of the study was to find efficacy of cognitive behavior therapy (CBT) in managing smartphone addiction, insomnia, and aggression among adolescent boys is examined in this study. There were 150 students who took part in the study. They were evaluated using the Aggression Questionnaire by Buss (2000), the Insomnia Inventory by The London Sleep Centre (2004), and the Smartphone Addiction Scale created by Kwol et al. (2013). A total of fifty-eight (58) students were selected and given two-hour sessions of Cognitive Behaviour Therapy (CBT) every other day for a month. Following the conclusion of the intervention, the fifty-eight students were reassessed using the same set of questionnaires. A follow-up phase assessment was conducted after a one-month break. Targeting maladaptive behavior, emotion control, track usage, auto-suggestions, sleep hygiene, self-reinforcement, psychoeducation, self-monitoring, cognitive rehearsal, role-playing/modeling, and journaling assignments were all part of Cognitive Behaviour Therapy (CBT). In the Before, After, and Follow-Up periods, notable variations have been distinguished. Bonferroni Post Hoc Test, Mean, Standard Deviation, and Repeated Measures ANOVA were used to interpret the data. The results unequivocally show that during the intervention program, there was a significant decrease in the usage of smartphones, as well as in the symptoms of aggressive behavior and insomnia. It came to light that cognitive behavior therapy was useful in controlling teenage boys' levels of hostility, sleeplessness, and smartphone addiction.

Keywords: Adolescent boys, cognitive behavioral therapy, aggression, insomnia, and smartphone addiction

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Introduction

Smartphone addiction, insomnia, and aggression are increasingly recognized as intertwined issues in adolescent health, where excessive use of smartphones can disrupt sleep patterns and heighten aggressive behaviors. Adolescents are especially vulnerable due to their developmental stage and sensitivity to peer influence, making them more susceptible to the negative consequences of technology overuse. Nearly half of all adults in the United States admit to reading or sending text messages while driving, according to Pew Research Center (2010).

Smartphone addiction, defined as a behavioral dependency on mobile devices, is becoming a common issue among adolescents. Studies indicate that compulsive smartphone use can interfere with daily functioning, reduce academic performance, and diminish face-to-face interactions. Researchers have linked smartphone addiction to issues with self-regulation, whereby adolescents feel compelled to check notifications, use social media, and engage in gaming, even when it negatively impacts their day-to-day life (Elhai et al., 2017). Addiction to smartphones is linked to musculoskeletal pain in the neck, shoulder, elbow, and hand (Ahmed, Mishra, Akter, Shah, and Sadia, 2022). The study found that those who use their smartphones experience pain in their shoulders (39.2%), eyes (62.2%), and neck (67.7%), as well as having a major mental disorder (30.7%). (Alotaibi et al. 2022). Smartphone addiction often leads to sleep disturbances, primarily because smartphone use before bedtime can interfere with sleep quality and duration. The blue light emitted by smartphones can suppress melatonin production, disrupting the body's circadian rhythm and making it difficult to fall asleep. Adolescents need about 8-10 hours of sleep for optimal functioning, but smartphone addiction has been linked to reduced sleep quality and chronic sleep deprivation, which affects emotional and cognitive functioning (Levenson et al., 2016). Aggression in adolescents has been observed to correlate with both smartphone addiction and insomnia. Sleep-deprived adolescents often have greater difficulty regulating emotions, which can lead to irritability and aggressive behaviour. According to the National Sleep Foundation, 75% of 12th graders (17-18 years old) slept less than 8 hours every night (National Sleep Foundation, 2018). This is especially noteworthy given that adolescent self- report of sleep is frequently overstated (Arora, Broglia, Pushpakumar, Lodhi and Taheri, 2013). These teenagers aren't getting enough sleep, which is harming one's performance. Additionally, continuous smartphone use exposes adolescents to online environments where they may encounter aggressive content, cyberbullying, or peer pressure. Studies have shown that smartphone addiction can indirectly increase aggressive tendencies by heightening emotional stress and reducing impulse control (Hussain & Griffiths, 2019).

In conclusion, smartphone addiction, insomnia, and aggression form a complex cycle that significantly affects adolescent health. Addressing these issues requires a multifaceted approach that includes promoting healthy digital habits, encouraging sufficient sleep, and providing support to help adolescents manage emotional and behavioral challenges.

Studies shows CBT effectibely reduces smartphone use and associated anxiety by promoting mindfulness and self-regulation (Liu et.al., 2020). CBT for insomnia (CBT-I) is recognized as first line treatment for chronic insomnia (Morin et al., 2006). CBT significantly reduces aggressive behaviour, particularly when combined with anger management and mindfulness training (Sukhodolsky et al., 2004).

Method

The current research focuses on core objective to understand the seriousness of smartphone addiction among college going adolescent boys. To find out the efficacy of cognitive behaviour therapy (CBT) in managing smartphone addiction, insomnia and aggression among adolescent boys. Addressing these factors, the tools used in the study were informed consent form, demographic details of the students. The psychological tools used were smartphone addiction scale (Kwon et al, 2013), insomnia inventory (The London Sleep Center, 2004), aggression questionnaire (Buss, 2000). Based on the objective the hypotheses were taken into consideration upon the factors of

1.There will be a significant reduction in smartphone addiction among adolescent boys during before, after and follow-up without control group through cognitive behaviour therapy.

2.There will be a significant reduction in insomnia among adolescent boys during before, after and follow-up through without control group cognitive behaviour therapy.

3.There will be a significant reduction in aggression among adolescent boys during before, after and follow-up without control group through cognitive behaviour therapy.

3.1 There will be a significant reduction in physical aggression of adolescent boys during before, after and follow-up without control group through cognitive behaviour therapy.

3.2 There will be a significant reduction in verbal aggression of adolescent boys during before, after and follow-up without control group through cognitive behaviour therapy.

3.3 There will be a significant reduction in anger of adolescent boys during before, after and follow-up without control group through cognitive behaviour therapy.

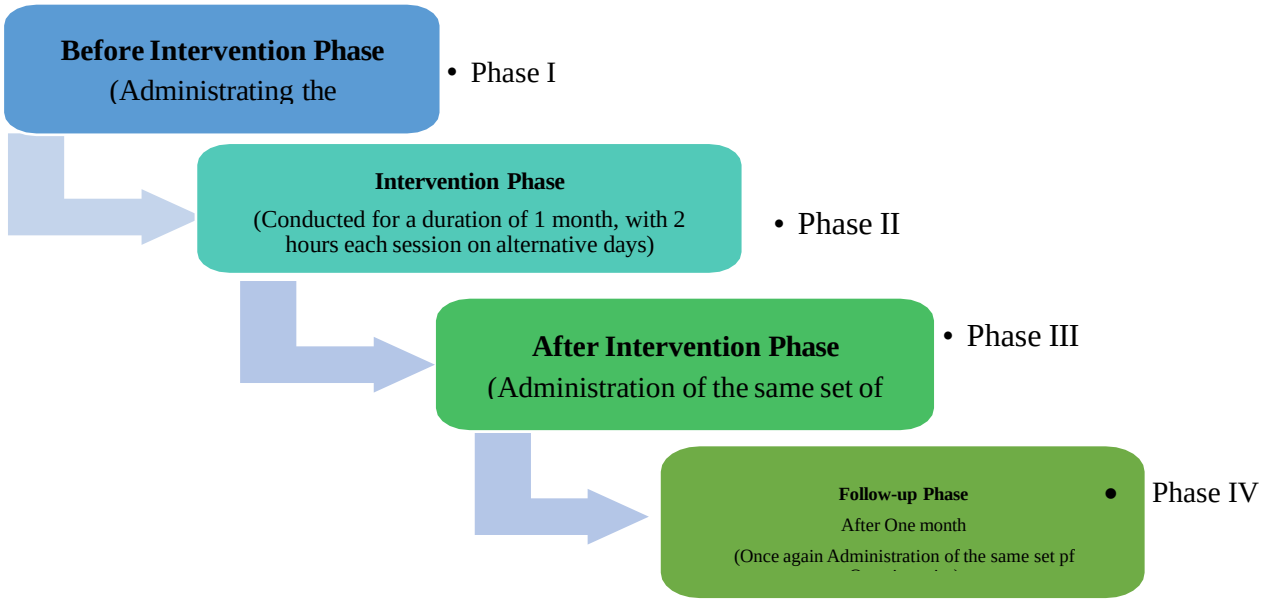
3.4 There will be a significant reduction in hostility of adolescent boys during before, after and follow-up without control group through cognitive behaviour therapy.

3.5 There will be a significant reduction in aggression of adolescent boys during before, after and follow-up without control group through cognitive behaviour therapy.

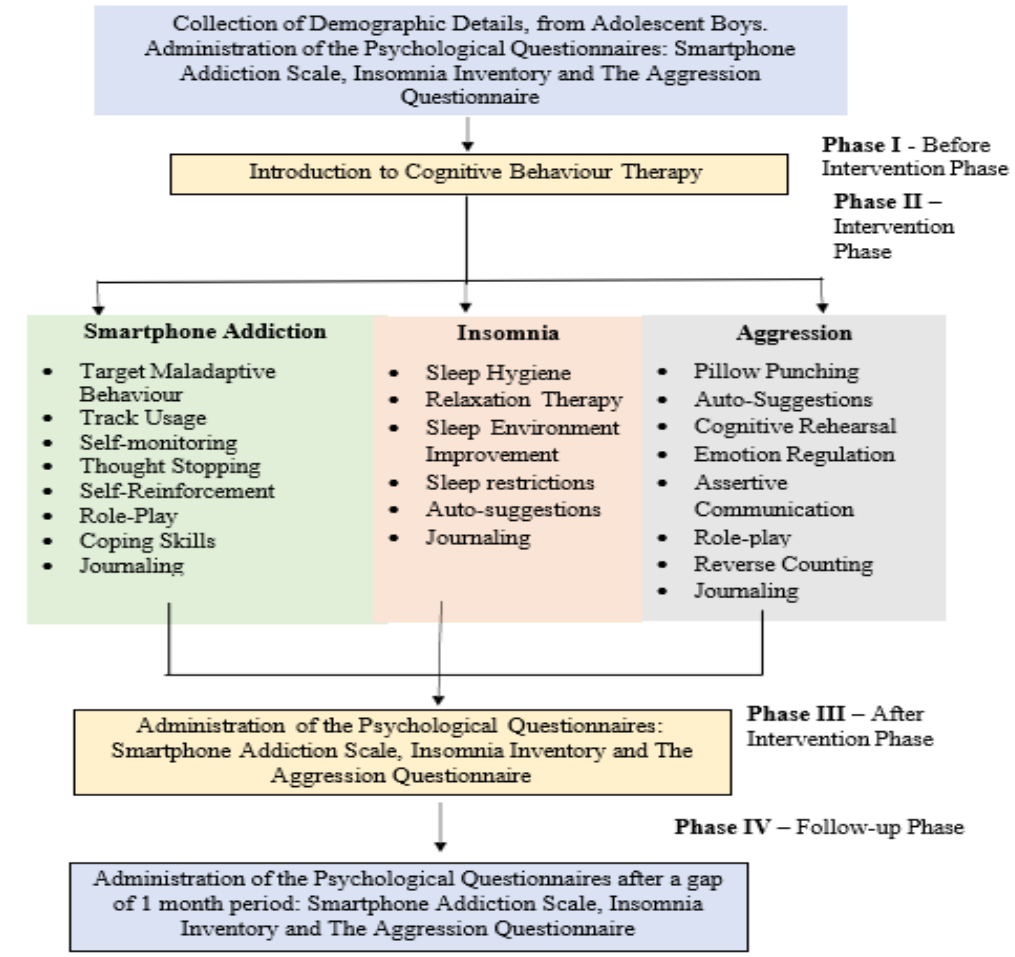
4. Cognitive Behaviour Therapy would be helpful to manage smartphone addiction, insomnia and aggression among adolescent boys.

The research design adopted for the study is before, after and follow-up without control group. The study

met for main phases, before intervention phase, the data was collected from the students and the screening procedure was done, followed by 58 adolescent boys who met the criteria and who have consented to take part in the study and they have undergone the intervention phase for the duration of one month. After one month of intervention, post-assessment was conducted with the same set of questionnaires. Later after one month of time interval, the follow-up was done. The below mentioned flow chart represents the methods and techniques followed during intervention programme. The research design followed in the study is



Flow Chart



Data Collection and Analyses

The study participants were selected using purposive sampling method. he Fishers method was used to calculate the sample size of 150 and recruited 58 adolescent boys who were taken further into the study. Before data collection, questionnaire pre-testing was done using Smartphone addiction scale, Insomnia Inventory and Aggression Questionnaire. Adolescent boys who met the criteria and consented to participate in the study were assigned to cognitive behavior therapy. Data collection was done for a duration of 2 hours each on every alternate days for one month. After one month the study participants were reassessed with the same set of questionnaire and recorded their score. A follow-up was done after a duration of 1 month time interval. The collected data was coded and entered in SPSS version 25. Descriptive, Bonferroni Post Hoc Test, Repeated Measures ANOVA was used to analyse data. Tables and graphs were used to present the data results.

Research Ethics

A proposal was submitted through the Supervisor and Head of the Department to Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, Tamil Nadu, India and obtained permission to conduct the present study. Before conducting the study, ethical clearance has been obtained from the university ethical committee. Permission was also obtained from Rathinam Technical Campus, Coimbatore, Tamil Nadu, India, to conduct the study. Informed written consent was obtained from the participants. During the data collection, the procedure was explained to the students and told that information would be kept confidential. The students were specified freedom to withdraw from the study at any stage. The tool was given to each student to give self-report by providing a peaceful and relatively environment is spacious meeting hall arrangement for the institution. The above consideration was followed for Phase I, Phase II, Phase III and Phase IV.

Results

Table 1 shows the data of the participants, focusing on age, gender, qualification, and family type. Table 1 provides a breakdown of demographic characteristics of the study population. Participants ranged from 17 to 19 years old. A majority of them were aged 19 (40%), followed by 18-years old (36%) and 17 years old (24%). All participants were male. The participants held various academic qualifications, with the largest group being in Mechanical Engineering (28%), followed by Information Technology (22%), Computer Science Engineering (19%), Electronics and Communication Engineering (17%), and Civil Engineering (14%). The socio-economic status of the participants were 83% belongs to middle socio-economic status, whereas entertainment being the dominant purpose of smartphone use. There is also a prevalence of self-report non-addiction to smartphones, yet a significant portion of the sample suffers from reduced sleep duration, highlighting a potential area for further study into smartphone usage's impact on sleep health.

Table 2 represents the data reveal a substantial reduction in smartphone addiction scores from the baseline to the follow-up period, suggesting that the intervention was effective. The decrease from the "before" phase to the "after" phase (from a mean of 144.93 to 86.22) represents a major decline in reported addiction symptoms, which was sustained, as evidenced by the mean of 81.88 in the follow-up phase. The consistency of reduced scores over time indicates potential long-term benefits of the intervention.

Table 3 presents the Repeated Measures ANOVA shows significant differences in smartphone addiction scores across phases, with an F-value of 282.53 ($p<.001$), indicating the intervention's strong effect in reducing addiction scores over time. The robustness of these findings, regardless of the correction applied, supports the intervention's success in maintaining lower addiction levels in the follow-up phase.

Table 4 shows the pairwise comparison results are summarized on before-after, before-follow-up and after-follow-up phases of intervention. The mean differences observed in all three phases were 53.71, $p<.001$, 63.05, $p<.001$, and 4.35, $p=.774$ which is not significant.

Table 5 data demonstrate a substantial reduction in insomnia scores from the before phase (Mean = 56.21, SD = 15.99) to the after phase (Mean = 16.38, SD = 4.85). The follow-up phase mean (Mean = 14.83, SD = 5.69) shows that this reduction was sustained over time. The results indicate a significant decrease in insomnia scores immediately following the intervention, with the reduction remaining stable at follow-up. This suggests that the intervention had a lasting impact on reducing insomnia among adolescent boys.

Table 6 the repeated measures ANOVA shows the significant F value across all corrections ($F = 283.093$, $p < .001$) indicates that insomnia scores differed significantly across phases, demonstrating a strong effect of the intervention. The significant F-values across all sphericity corrections confirm that insomnia scores changed substantially across the phases. The consistent results across correction methods suggest that the intervention effectively reduced insomnia levels, with differences between phases indicating potential long-term benefits. These findings align with the hypothesis that targeted interventions can effectively mitigate insomnia in adolescents.

Table 7 shows the pairwise comparison results for insomnia scores across phases with a mean difference of 39.83, $p<.001$, 41.38, $p<.001$, and 1.55, $p=.388$ which is not significant. These results demonstrate a statistically significant reduction in insomnia scores from the before to both the after and follow-up phases. The lack of significant change between the after and

follow-up phases suggests that the reduced insomnia levels remained stable over time. The pairwise comparisons reveal significant decreases in insomnia scores following the intervention, with these decreases persisting through the follow-up phase. This pattern suggests that the intervention had both immediate and lasting effects in reducing insomnia among adolescent boys.

Table 8 data indicate a substantial reduction in physical aggression scores from the before phase (Mean = 64.10, SD = 5.15) to the after phase (Mean = 50.98, SD = 2.67), with a slight further reduction observed in the follow-up phase (Mean = 49.24, SD = 7.39). These results suggest that the intervention was effective in reducing physical aggression among adolescent boys, with the reduction sustained over time. The significant decrease in physical aggression scores from the before to after phases implies that the intervention had a strong immediate effect. The further reduction in aggression at follow-up suggests the potential long-term impact of the intervention. These findings support the effectiveness of behavioral interventions in reducing aggression among adolescents and emphasize the need for continued support to maintain these improvements.

Table 9 shows the repeated measures ANOVA, indicate significant differences in physical aggression scores across phases. Each correction confirms the significant effect of the intervention across phases, with an F-value of 131.68 ($p < .001$), indicating substantial reductions in physical aggression scores across phases. The significant F-values across all sphericity corrections highlight consistent evidence of reduced aggression scores across the three phases, suggesting that the intervention had a lasting impact on lowering aggression levels among adolescent boys. This consistency across correction methods supports the robustness of the findings. These results suggest that behavioral interventions can effectively address physical aggression in adolescent populations.

Table 10 shows the results demonstrate that while physical aggression scores significantly decreased from before to both the after and follow-up phases (13.12, p<.001; 14.,p<.001, and 1.75, p=.321 not significant), there was no significant difference between the after and follow-up phases. This suggests that the reduction in aggression levels achieved after the intervention was maintained over time. The pairwise comparisons reveal that the intervention was effective in significantly reducing physical aggression among adolescent boys, with these reductions remaining stable during the follow-up phase. The lack of significant change between the after and follow-up phases suggests that the benefits of the intervention persisted beyond the immediate post-intervention period.

Table 11 The data show a significant reduction in verbal aggression from the before phase (Mean = 62.62, SD = 5.03) to the after phase (Mean = 49.72, SD = 4.23). There was a slight further reduction in verbal aggression scores at the follow-up phase (Mean = 47.66, SD = 7.96), indicating that the intervention was effective and that the effects were sustained over time. The significant decrease in verbal aggression scores from the before phase to both the after and follow-up phases suggests that the intervention had a substantial effect on reducing verbal aggression. The continued reduction at follow-up highlights the potential for long-term benefits from the intervention. These results emphasize the importance of interventions aimed at reducing verbal aggression in adolescents.

Table 12 The significant F-values across all sphericity corrections confirm that verbal aggression levels changed significantly across the three phases, indicating the intervention was effective in reducing aggression. The results also suggest that the reduction in aggression was sustained over time, as evidenced by the follow-up phase showing similar findings. These findings support the use of interventions aimed at reducing verbal aggression among adolescents.

Table 13 The significant reductions in verbal aggression scores from the before phase to both the after and follow-up phases suggest that the intervention effectively reduced aggression levels in adolescent boys. The lack of significant change between the after and follow-up phases indicates that the reduction in aggression was maintained over time. These findings support the efficacy of the intervention in reducing verbal aggression, with the benefits persisting beyond the immediate post-intervention period.

Table 14 The results indicate a significant reduction in anger from the before phase (Mean = 64.62, SD = 6.14) to the after phase (Mean = 49.59, SD = 4.08), as well as a slight further reduction at the follow-up phase (Mean = 48.97, SD = 7.03). These changes suggest that the intervention was effective in reducing anger levels, with the reduction being maintained at follow-up. The findings show that the intervention significantly reduced anger levels in adolescent boys, with the effect sustained at the follow-up phase. These results suggest that targeted interventions can be effective in managing anger among adolescents, and that the benefits of such interventions can persist over time.

Table 15 The significant F-values across all corrections provide strong evidence that anger levels in adolescent boys were significantly reduced from the before phase to both the after and follow-up phases. The results suggest that the intervention was effective and that the benefits were sustained over time.

Table 16 These results suggest that the intervention successfully reduced anger levels from the before phase to both the after and follow-up phases, but the effects did not change significantly between the after and follow-up phases. The results indicate that the intervention was successful in reducing anger levels in adolescent boys, with significant reductions observed from before the intervention to both the after and follow-up phases. However, no significant change was observed between the after and follow-up phases,

suggesting that the reduction in anger was sustained over time. These findings support the efficacy of the intervention in managing anger in adolescents.

Table 17 The results indicate a significant reduction in hostility from the before phase (Mean = 65.78, SD = 5.79) to the after phase (Mean = 51.07, SD = 3.32), as well as a further reduction at the follow-up phase (Mean = 48.50, SD = 9.38). These results suggest that the intervention was effective in reducing hostility levels, and this reduction was sustained over time. The findings demonstrate that the intervention significantly reduced hostility levels in adolescent boys, with the reduction maintained at the follow-up phase. These results suggest that the intervention had a lasting impact on hostility, improving emotional regulation in adolescents.

Table 18 The significant F-values across all corrections indicate that hostility levels significantly changed across the three phases. These results suggest that the intervention was effective in reducing hostility levels, with the effect maintained at follow-up. The significant F-values across all corrections provide strong evidence that hostility levels significantly decreased from the before phase to both the after and follow-up phases. The intervention was successful in reducing hostility in adolescent boys, and the reduction was sustained at follow-up.

Table 19 The results demonstrate that the intervention successfully reduced hostility levels in adolescent boys, with significant reductions observed from the before phase to both the after and follow-up phases (mean difference = 14.71, p<.001; 1728, p<001). However, there was no significant difference between the after and follow-up phases (mean difference = 1.31, p<=.204), suggesting that the reduction in hostility was maintained after the intervention. These findings support the effectiveness of the intervention in managing hostility.

Table 20 The data indicate a significant reduction in indirect aggression levels from the before phase (Mean = 63.90, SD = 6.30) to the after phase (Mean = 46.22, SD = 4.27). This reduction was maintained at the follow-up phase (Mean = 45.28, SD = 6.49). The intervention appears to have been effective in reducing indirect aggression levels, with the effect lasting over time. The results suggest that the intervention was successful in reducing indirect aggression in adolescent boys, as indicated by the significant drop in aggression scores from the before phase to both the after and follow-up phases. The sustained effect at follow-up highlights the potential long-term benefits of the intervention.

Table 21 The significant F-values from all corrections indicate that there were significant differences in indirect aggression levels across the three phases, suggesting that the intervention was effective in reducing aggression levels. These findings were consistent regardless of the correction method applied. The results of the repeated measures ANOVA provide strong evidence that indirect aggression levels significantly decreased over time. The significant F-values across all corrections suggest that the intervention had a substantial effect on reducing aggression. These results highlight the importance of interventions in modifying aggressive behaviors in adolescents.

Table 22 shows the pairwise comparison. These results suggest that while the intervention was effective in reducing indirect aggression levels in adolescent boys, the effects did not significantly change between the after and follow-up phases. The findings indicate that the intervention successfully reduced indirect aggression levels, as evidenced by the significant decreases observed from the before phase to both the after and follow-up phases (before-after, mean difference 17.6, p<.001; before-follow-up, mean difference 18.62, p<.001). However, the absence of a significant difference between the after and follow-up phases (mean difference = 0.95, p<1.000) suggests that the reduction in aggression remained stable over time, without further improvement or relapse. These results highlight the potential long-term effectiveness of the intervention in managing indirect aggression in adolescents.

Table 23 The data show significant reductions in aggression levels from the before phase (Mean = 64.31, SD = 7.48) to both the after phase (Mean = 47.74, SD = 6.91) and the follow-up phase (Mean = 47.43, SD = 4.81). The aggression levels decreased significantly after the intervention and remained relatively stable at follow-up, suggesting that the effects of the intervention persisted over time. The findings of this study indicate that the intervention successfully reduced aggression levels in adolescent boys. The significant decrease in aggression from the before phase to both the after and follow-up phases suggests that the intervention was effective in managing aggressive behavior. Additionally, the stability of aggression scores at follow-up indicates that the effects of the intervention were maintained.

Table 24 The results of the repeated measures ANOVA indicate that there were significant differences in aggression levels across the three phases (before, after, and follow-up). This suggests that the intervention had a significant effect in reducing aggression in adolescent boys. The significant F-values, consistent across all corrections, support the effectiveness of the intervention in modifying aggression.

Table 25 The findings indicate that the intervention successfully reduced aggression levels in adolescent boys, with significant decreases observed from the before phase to both the after and follow-up phases (16.57, p<.001; 16.41, p<.001). The lack of a significant difference between the after and follow-up phases (mean difference = -0.15, p=1.000) suggests that the reduction in aggression was maintained over time, with no further improvement or relapse. These results support the effectiveness of interventions in managing aggression in adolescents

Conclusion:

In summary, this study underscores the pivotal effectiveness of CBT in managing smartphone addiction, insomnia and aggression among adolescent boys. By examining specific needs and wants of smartphone usage, brought into light that, many were using their smartphone on entertainment purpose rather than need purpose. This insight has paved it way better during the intervention path. Although this study has limitations as only male gender was taken into consideration. Future research should include both male and female as study participants and explore more on specific functionalities of smartphone usage and its affect on gender, the findings open promising avenues for future research. Ultimately, this research provides a foundation, contributing to the ongoing conversation in technology in human science.

Table 1

Demographic Details	Options	Frequency	Percent
Age	17	14	24
	18	21	36
	19	23	40
Gender	Male	100	58
Qualification	Mechanical	16	28
	Information Technology	13	22
	Computer Science Engineering	11	19
	Electronics and Communication Engineering	10	17
	Civil Engineering	8	14
Family Type	Nuclear	45	78
	Joint	13	22
Socio-economic Status	Lower	10	17
	Middle	48	83
	Upper	0	0
Purpose of Smartphone Usage	Message	12	21
	Entertainment	40	69
	Web Surfing	5	8
	Others	1	2
Self-evaluation of Smartphone Usage	Non-addicted	42	72
	Addicted	11	19
	Don't Know	5	9
Hours of Sleep	Less than 6 hours	46	79
	6-8 hours	12	21

Table 2

Variable	Groups	Phases	Mean	SD	N
Smartphone Addiction	Adolescent Boys	Before	144.93	21.53	58
		After	86.22	20.39	58
		Follow-up	81.88	17.48	58

Table 3

Phases	Sum of Squares	Df	Mean Square	F
Sphericity Assumed	180977.84	2	90488.92	282.53**
Greenhouse-Geisser	180977.84	1.82	99268.93	282.53**
Huynh-Feldt	180977.84	1.88	96257.73	282.53**
Lower-bound	180977.84	1.00	320.28	282.53**

Significant at 0.001 level

Table 4

Measure	Group	Phases	Phases	Mean Difference	Sig
Smartphone Addiction	Adolescent Boys	Before	After	58.71*	.000
			Follow-up	63.05*	.000
		After	Before	-58.71*	.000
			Follow-up	4.35	.774 (NS)
		Follow-up	Before	-63.05*	.000
			After	-4.35	.774 (NS)

Table 5

Variable	Groups	Phases	Mean	SD	N
Insomnia	Adolescent Boys	Before	56.21	15.99	58
		After	16.38	4.85	58
		Follow-up	14.83	5.69	58

Table 6

Phases	Sum of Squares	Df	Mean Square	F
Sphericity Assumed	63817.241	2	31908.621	283.093**
Greenhouse-Geisser	63817.241	1.292	49375.744	283.093**
Huynh-Feldt	63817.241	1.310	48724.075	283.093**
Lower-bound	63817.241	1.000	63817.241	283.093**

** - ***Significant at 0.01 level***

Table 7

Measure	Group	Phases	Phases	Mean Differences	Sig
Insomnia	Adolescent Boys	Before	After	39.83*	.000
			Follow-up	41.38*	.000
		After	Before	-39.83*	.000
			Follow-up	1.55	.388 (NS)
		Follow-up	Before	-41.38*	.000
			After	-1.55	.388 (NS)

**** - Significant at 0.05 level***

Table 8

Variable	Groups	Phases	Mean	SD	N
Physical Aggression	Adolescent Boys	Before	64.10	5.15	58
		After	50.98	2.67	58
		Follow-up	49.24	7.39	58

Table 9

Phases	Sum of Squares	Df	Mean Square	F
Sphericity Assumed	7657.28	2	3828.64	131.68**
Greenhouse-Geisser	7657.28	1.56	4921.58	131.68**
Huynh-Feldt	7657.28	1.59	4811.34	131.68**
Lower-bound	7657.28	1.00	7657.28	131.68**

**** - Significant at 0.01 level**

Table 10

Measure	Group	Phase	Phase	Mean Difference	Sig
Physical Aggression	Adolescent Boys	Before	After	13.12*	.000
			Follow-up	14.86*	.000
		After	Before	-13.12*	.000
			Follow-up	1.741	.312 (NS)
		Follow-up	Before	-14.86*	.000
			After	-1.74	.312 (NS)

*** - Significant at 0.05 level** **NS - Not Significant**

Table 11

Variable	Groups	Phases	Mean	SD	N
Verbal Aggression	Adolescent Boys	Before	62.62	5.03	58
		After	49.72	4.23	58
		Follow-up	47.66	7.96	58

Table 12

Phases	Sum of Squares	Df	Mean Square	F
Sphericity Assumed	7628.32	2	3814.16	100.32**
Greenhouse-Geisser	7628.32	1.64	4648.36	100.32**
Huynh-Feldt	7628.32	1.68	4531.95	100.32**
Lower-bound	7628.32	1.00	7628.32	100.32**

**** - Significant at 0.01 level**

Table 13

Measure	Group	Phase	Phase	Mean Difference	Sig
Verbal Aggression	Adolescent Boys	Before	After	12.89*	.000
			Follow-up	14.97*	.000
		After	Before	-12.89*	.000
			Follow-up	2.07	.247 (NS)
		Follow-up	Before	-14.97*	.000
			After	-2.07	.247 (NS)

*** -Significant at 0.05 level** **NS - Not Significant**

Table 14

Variable	Groups	Phases	Mean	SD	N
Anger	Adolescent Boys	Before	64.62	6.14	58
		After	49.59	4.08	58
		Follow-up	48.97	7.03	58

Table 15

Phases	Sum of Squares	Df	Mean Square	F
Sphericity Assumed	9115.77	2	4557.89	126.83**
Greenhouse-Geisser	9115.77	1.96	4644.16	126.83**
Huynh-Feldt	9115.77	2.00	4557.89	126.83**
Lower-bound	9115.77	1.00	9115.77	126.83**

**** - Significant at 0.01 level**

Table 16

Measure	Group	Phase	Phase	Mean Difference	Sig
Anger	Adolescent Boys	Before	After	15.03*	.000
			Follow-up	15.66*	.000
		After	Before	-15.03*	.000
			Follow-up	.62	1.000 (NS)
		Follow-up	Before	-15.66*	.000
			After	-.62	1.000 (NS)

***-Significant at 0.05 level** **NS- Not Significant**

Table 17

Variable	Groups	Phases	Mean	SD	N
Hostility	Adolescent Boys	Before	65.78	5.79	58
		After	51.07	3.32	58
		Follow-up	48.50	9.38	58

Table 18

Phases	Sum of Squares	Df	Mean Square	F
Sphericity Assumed	10079.39	2	5039.69	110.15**
Greenhouse-Geisser	10079.39	1.55	6490.20	110.15**
Huynh-Feldt	10079.39	1.59	6345.41	110.15**
Lower-bound	10079.39	1.00	10079.39	110.15**

**** - Significant at 0.01 level**

Table 19

Measure	Group	Phase	Phase	Mean Difference	Sig
		Before	After	14.71*	.000
			Follow-up	17.28*	.000
Hostility	Adolescent	After	Before	-14.71*	.000
	Boys		Follow-up	1.31	.204 (NS)
		Follow-up	Before	-17.28*	.000
			After	-2.57	.204 (NS)

***-Significant at 0.05 level** **NS- Not Significant**

Table 20

Variable	Groups	Phases	Mean	SD	N
		Before	63.90	6.30	58
Indirect	Adolescent Boys	After	46.22	4.27	58
Aggression		Follow-up	45.28	6.49	58

Table 21

Phases	Sum of Squares	Df	Mean Square	F
Sphericity Assumed	12758.91	2	6379.45	195.72**
Greenhouse-Geisser	12758.91	1.89	6786.05	195.72**
Huynh-Feldt	12758.91	1.94	6569.56	195.72**
Lower-bound	12758.91	1.00	12758.91	195.72**

**** - Significant at 0.01 level**

Table 22

Measure	Group	Phase	Phase	Mean Difference	Sig
		Before	After	17.67*	.000
			Follow-up	18.62*	.000
Indirect	Adolescent	After	Before	-17.67*	.000
			Follow-up	.95	1.000 (NS)
Aggression	Boys				
		Follow-up	Before	-18.62*	.000
			After	-.95	1.000 (NS)

***-Significant at 0.05 level** **NS- Not Significant**

Table 23

Variable	Groups	Phases	Mean	SD	N
		Before	64.31	7.48	58
Aggression	Adolescent Boys	After	47.74	6.91	58
		Follow-up	47.43	4.81	58

Table 24

Phases	Sum of Squares	Df	Mean Square	F
Sphericity Assumed	10516.70	2	5258.35	156.19**
Greenhouse-Geisser	10516.70	1.90	5527.79	156.19**
Huynh-Feldt	10516.70	1.97	5348.09	156.19**
Lower-bound	10516.70	1.00	10516.70	156.19**

**** - Significant at 0.01 level**

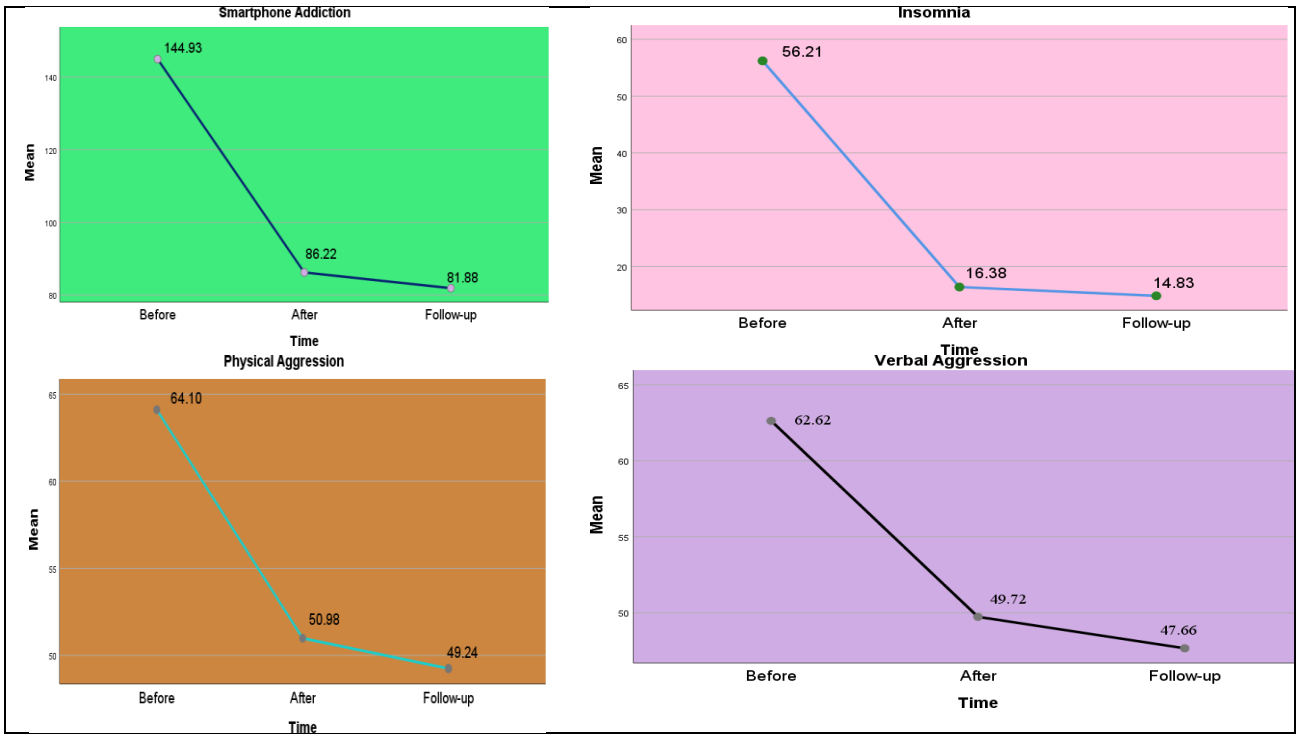
Table 25

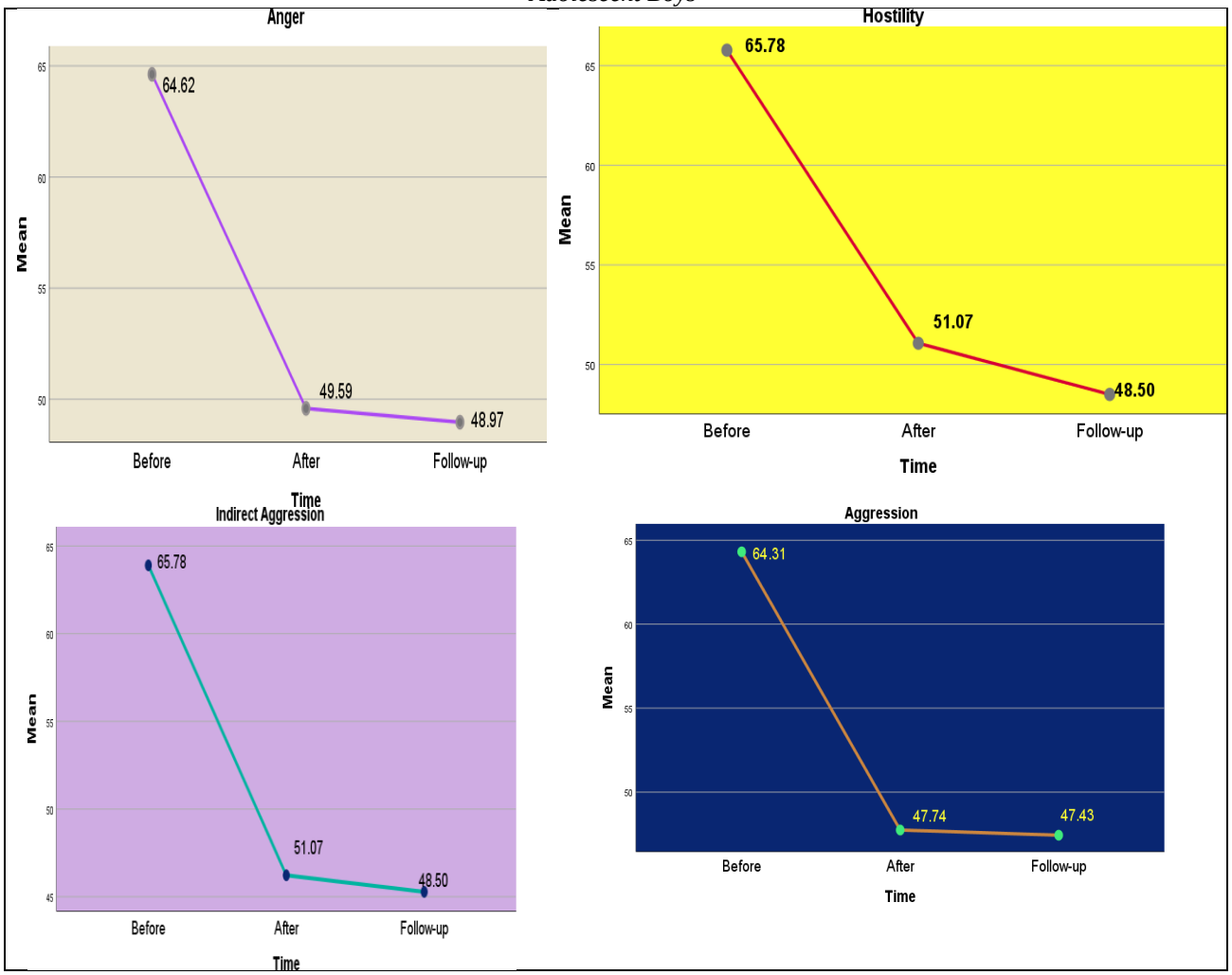
Measure	Group	Phase	Phase	Mean Difference	Sig
Aggression	Adolescent Boys	Before	After	16.57*	.000
			Follow-up	16.41*	.000
		After	Before	-16.57*	.000
			Follow-up	-.15	1.000 (NS)
		Follow-up	Before	-16.41*	.000
			After	.15	1.000 (NS)

***-Significant at 0.05 level** **NS- Not Significant**

References

1. Elhai, J. D., Levine, J. C., Dvorak, R. D., & Hall, B. J. (2017). Problematic smartphone use: A conceptual overview and systematic review of relations with anxiety and depression psychopathology. *Journal of Affective Disorders, 207*, 251–259.
2. Levenson, J. C., Shensa, A., Sidani, J. E., Colditz, J. B., & Primack, B. A. (2016). The association between social media use and sleep disturbance among young adults. *Preventive Medicine, 85*, 36–41.
3. Hussain, Z., & Griffiths, M. D. (2019). Problematic social networking site use and comorbid psychiatric disorders: A systematic review of recent large-scale studies. *Frontiers in Psychology, 10*, 681.
4. Desilver, D. (2010). Texting while driving may be common, but it's illegal in most states. Pew Research Center. http://pewrsr.ch/1bt6sC5.
5. Ahmed, S., Mishra, A., Akter, R., Shah, M. H & Sadia, A. A. (2022). Smartphone addiction and its impact on musculoskeletal pain in neck, shoulder, elbow, and hand among college going students: a cross-sectional study. Bulletin of faculty of physical therapy, 27, 5. https://doi.org/10.1186/s43161-021-00067-3
6. Alotaibi, M. S., Fox, M., Coman, R., Ratan, Z. A & Hosseinzadeh, H. (2022). Smartphone addiction prevalence and its association on academic performance, physical health, and mental well-being among university students in Umm Al-Qura University (UQU), Saudi Arabia. Int J Environ Res Public Health, 19(6). doi: 10.3390/ijerph19063710.
7. Arora, T., Broglia, E., Pushpakumar, D., Lodhi, T., & Taheri, S. (2013). An investigation into the strength of the association and agreement levels between subjective and objective sleep duration in adolescents. PLoS ONE, 8, e72406. doi: 10.1371/journal.pone.0072406.
8. Liu, Q., et al. (2022). "Effectiveness of CBT in managing smartphone addiction: A meta-analytic review." Journal of Behavioral Addictions, 11(3), 124–135.
9. Morin, C. M., et al. (2006). "CBT-I for chronic insomnia: Evidence and guidelines." Sleep Medicine Clinics, 1(3), 343–356.
10. Sukhodolsky, D. G., et al. (2004). "CBT for anger and aggression in children and adolescents: A meta-analysis." Journal of the American Academy of Child & Adolescent Psychiatry, 43(1), 47–54.




Anger
Mean
65
60
55
50
64.62
49.59
48.97
Before
After
Follow-up
Time
Hostility
65.78
51.07
48.50
Indirect Aggression
65.78
51.07
48.50
Aggression
64.31
47.74
47.43