



DIGITAL DETOXIFICATION: EVALUATING INTERVENTION STRATEGIES FOR ADOLESCENTS

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Abstract

Excessive digital use among adolescents is increasingly linked to adverse mental health, reduced productivity, and impaired academic performance. Digital detoxification, a strategy involving temporary disengagement from digital devices, has emerged as a promising intervention. This study evaluates the efficacy of an interventional package designed to promote digital detoxification among adolescents in Bhubaneswar, Odisha. Using a pre-experimental, randomized control group design, 500 students were enrolled and divided into intervention and control groups. Significant reductions in digital use were observed in the intervention group post-intervention (mean difference = 39.5, $p < 0.05$), while no notable changes were recorded in the control group. The intervention group showed a significant reduction in digital use following the intervention, with the post-test mean score decreasing to 36.2 ($SD = 28.46$), indicating the effectiveness of the intervention ($p < 0.05$). In contrast, the control group exhibited no significant change in digital use, as the post-test mean remained at 75.6 ($SD = 46.67$), suggesting that without intervention, digital use levels remained stable ($p > 0.05$). The findings underscore the potential of structured interventions to foster healthier digital habits, with broader implications for educational policies and adolescent health.

Keywords: Adolescent health, Balanced digital use for sustainability, Behavioural health interventions, Digital habits and well-being, Technology addiction.

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I. Introduction

Digital technology has become an inseparable part of modern life, offering convenience but also fostering overdependence. Adolescents are particularly vulnerable, with studies showing they are among the heaviest users of smartphones and social media platforms. Excessive digital use is associated with numerous challenges, including disrupted sleep patterns, anxiety, depression, and diminished academic performance. According to global data, over 4.48 billion people use social media, with adolescents spending significant portions of their day online. This has raised concerns about digital overuse becoming a public health issue.

The concept of digital detoxification emerged as a countermeasure to these issues. Defined as a temporary cessation of digital engagement, digital detox aims to restore balance by encouraging mindful technology use. Despite its potential benefits, limited research has focused on the application of digital detox strategies in specific demographics such as adolescents.

Significance of the Study

While global studies have explored digital detoxification, there is a notable research gap in understanding its application within Indian contexts, particularly among adolescents. With increasing internet penetration and reliance on technology for education and communication, interventions tailored for this demographic are imperative. This study addresses this gap by designing and evaluating a structured interventional package for digital detoxification.

Objectives

The study focuses on three main objectives:

1. To assess baseline levels of digital device usage among adolescents.
2. To evaluate the effectiveness of a digital detox intervention in reducing digital overuse.
3. To explore associations between post-intervention digital use and demographic factors.

Hypotheses

- **H1:** There will be a significant reduction in digital use post-intervention among adolescents.
- **H2:** Post-intervention digital use levels will show significant associations with demographic variables such as age, gender, and duration of device use.

II. Materials & Methods

This research employed a pre-experimental design with a randomized control group to measure the impact of a digital detox intervention. The design facilitated

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comparative analysis between an intervention group receiving the package and a control group without intervention.

The study was conducted at two prominent colleges in Bhubaneswar. A total of 500 adolescents aged 15–18 years were recruited using convenience sampling. The intervention group consisted of students from Chanakya Higher Secondary School, while the control group was drawn from KIIT +2 Science School. Inclusion criteria included active smartphone use and willingness to participate, while those using non-smart devices or with pre-existing conditions were excluded.

Intervention Package

The intervention comprised a multifaceted approach to digital detoxification:

1. **Educational Sessions:** Delivered through live demonstrations, these sessions emphasized the psychological and physical benefits of reduced digital use.
2. **Behavioral Strategies:** Students were encouraged to uninstall non-essential apps, limit social media engagement, and adopt alternative activities such as sports or reading.
3. **Feedback Mechanisms:** Real-time tracking of digital use helped students monitor their progress and understand the impact of the intervention.

Data Collection Tools

A self-structured questionnaire was developed to assess digital use. It included sections on demographic information, patterns of device use, and self-reported outcomes of digital detoxification. The tool was validated by experts and tested for reliability through a pilot study.

Steps for Digital Wellbeing and Parental Control on Smartphone Devices

1. **Access Device Settings**
 - Open “Settings” app
2. **Navigate to Digital Wellbeing & Parental Controls**
 - Select “Digital Wellbeing & parental controls”
3. **Set Up Digital Wellbeing**
 - “Dashboard”
 - View screen time statistics
 - Identify frequently used apps
4. **Establish Daily Limits**
 - Select apps
 - Set daily screen time limits
5. **Enable Focus Mode**
 - Choose apps to pause during Focus Mode
 - Schedule Focus Mode times

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6. Use Bedtime Mode

- Set a bedtime schedule
- Enable Do Not Disturb during bedtime

7. Set Up Parental Controls

- Tap "Parental controls"
- Follow prompts to set up a Google Family Link account

8. Manage App Permissions

- Review and restrict app permissions (e.g., age ratings)

9. Monitor Activity

- Regularly check activity reports in the Family Link app
- Adjust settings based on usage

10. Communicate with Children

- Discuss screen time and usage habits
- Educate about online safety

11. Adjust Controls as Needed

- Revisit and modify settings based on feedback and changing needs

12. Promote Healthy Digital Habits

- Encourage alternative activities (e.g., sports, reading)

Visualization Tips:

- Start with "Access Device Settings" at the top.
- Use arrows to connect each step logically, showing progression.
- Group related steps together with coloured boxes.
- Include feedback loops for monitoring and communication.

Steps for Digital detox for the samples after screen restriction.

Habit Tracking and Mindfulness Practice

➤ **Habit Tracking**

Step-1: Choose the Right Habit-Tracking Tool-Opting for physical habit trackers like bullet journals or printed habit sheets.

Step-2: Identify Habits to Track-

- Selecting 2–3 habits to focus on initially (e.g., limiting screen time, practicing mindfulness, engaging in hobbies).
- Defining SMART goals for each habit (Specific, Measurable, Achievable, Relevant, Time-bound).

Step-3: Set Daily and Weekly Goals-

- Assigning specific times or limits for each habit (e.g., "No screens after 9 PM" or "15 minutes of meditation daily").
- Planning "habit milestones" to track weekly progress and celebrate small victories.

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Step-4: Record Progress Daily- For physical trackers, use symbols like checkmarks or stickers for completed tasks.

Step-5: Review and Adjust-

- Weekly review sessions to evaluate progress.
- Adjust goals or habits based on what works best for maintaining digital balance.

➤ **Mindfulness practice**

Step 1: Select Mindfulness Resources

- **Books:** Choose beginner-friendly mindfulness guides like *The Miracle of Mindfulness* by Thich Nhat Hanh.
- **Tools:** Use meditation cushions, candles, or aromatherapy oils to create a calming environment.

Step 2: Schedule Mindfulness Sessions

- Start with short daily sessions (5–10 minutes).
- Gradually increase the duration as comfort with practice grows.
- Dedicate specific times (e.g., morning or bedtime) for consistency.

Step 3: Practice Guided Mindfulness Techniques

- **Breathing Exercises:** Focus on slow, deep breathing for 5 minutes.
- **Body Scans:** Mentally scan your body for tension and consciously relax each part.
- **Visualization:** Picture calming scenes, like a beach or forest, to reduce stress.

Step 4: Use Reminders to Build Consistency

- Use analog tools like sticky notes in visible locations to prompt practice.
- Pair mindfulness sessions with existing habits (e.g., after brushing teeth).

Step 5: Reflect and Journal

- Maintain a mindfulness journal to document experiences, emotions, and insights from each session.
- Note improvements in mood, focus, or sleep over time.

The Procedure of Data Collection

Approval was obtained from the Institutional Ethics Committee. Participants provided informed consent, and data confidentiality was strictly maintained. Data was gathered through the use of a self-structured questionnaire. A formal authorization had been obtained. Through direct human communication, the researcher described the purpose of the study to the study samples to obtain their consent before beginning their involvement to acquire their cooperation. Additionally, the researcher ensured that confidentiality and voluntary participation were preserved. Parents of the experimental

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group had been introduced with the strategies of Parental control in the smartphone use. A pre-test was conducted on both groups. The intervention package was provided in 60-minute sessions for adolescents and 45-minute sessions and samples are encouraged to strictly follow the process of digital detox for 15 days. Biofeedback was taken 15 days from the beginning of the intervention period and a Post-test was done after 7 days of the end day of intervention by using the same tool among the participants. Then, data was analyzed.

III. Results

Participant Demographics

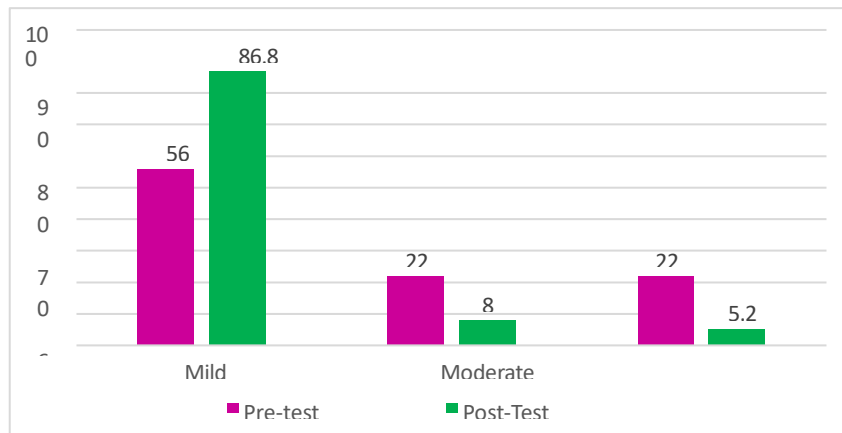
Regarding the age of the participants in the interventional group, the majority of them 131 (52.4%) were in the age between 15-16 years. Those who were in the age between 17-18 years were 119 (47.6 %), regarding the age of participants in the control group, the majority of them 130 (52.0%) were in the age between 17-18 years. Those who were in the age between 15-16 years were 120 (48.0 %).

The gender of the participants, in the interventional group, depicts that the majority 147 (58.8 %) were females and the males were 103 (41.2 %). The gender of the participants, in the control group, depicts that the majority 136 (54.4 %) were males and the females 114 (45.6 %). Concerning Class and Year, among the samples in the interventional group, the majority of participants 87 (34.8 %) were in 11th grade Second Year, 11th First Year 76 (30.4%), and 12th Second year 44 (17.6%) and the minority were from 12th First Year with 43 (17.2%). Concerning Class and year, among the samples in the control group, the majority of the participants were in the 12th First Year with 79 (31.6%), and 11th second year were of 70 (28.0%) and 11th First year were of 55 (22.0%) and the minority were of 12th second year with 46 (18.4%).

Years of using digital gadgets the participants in the interventional group show the majority 135 (54.0 %) were used from 5-8 years and 115 (46.0%) were used from 1-4 years. Years of using any digital gadget of the participants in the control group shows majority of 150 (60.0%) were using from 1-4 years and 100 (40.0%) were using from 5-8 years.

Table – 1: Distribution of Participants According to Digital Use in Interventional Group (n = 250)

Levels of Digital Use	Pre-Test f (%)	Post-Test f(%)
Mild	140 (56)	217 (86.8)
Moderate	55 (22)	20 (8)
Severe	55 (22)	13 (5.2)



Digital Use Pre- and Post-Intervention

Among the interventional group participants, the pre-test mean digital use score was 75.7 ± 51.22 , which was reduced to 36.2 ± 28.46 in the post-test. The mean difference was 39.5, and the paired 't' test score was 1.65099 (df = 249), showing statistical significance at $p < 0.00$. This indicates a significant reduction in digital use.

In the control group, the pre-test mean was 75.62 ± 47.13 , and the post-test mean was 75.44 ± 46.67 . The mean difference was 0.188, with a paired 't' test value of 0.064 (df = 249), which was not statistically significant at $p < 0.05$. This suggests no significant change in digital use.

Table 2 Comparison of Pre-Test, Post -Test, Mean, Mean Difference, Standard Deviation, and Independent 't' test value of Participants in Interventional and Control Group (n = n1+n2=500)

Pre-Test	Mean	Mean difference	Standard Deviation	Unpaired 't' test	'P' Value
Interventional Group	75.7	0.1	51.22	0.01 (df=494)	0.98 Insignificant
Control Group	75.6		47.13		

Pre-Test	Mean	Mean difference	Standard Deviation	Unpaired 't' test	'P' Value
Interventional Group	36.22	39.22	28.46	11.34 (df=494)	0.00
Control Group	75.44		46.67		

Statistical Insights

A paired t-test revealed a mean difference of 39.5 in digital use within the intervention group ($p < 0.05$). An unpaired t-test comparing post-test results between groups showed significant differences ($p < 0.05$), confirming the intervention's efficacy. There was no significant difference in the level of digital use between the interventional and control groups during the pre-test phase. The unpaired 't' test value was 11.34 with 494 degrees of freedom, which was statistically significant at $p < 0.05$. This indicates a significant difference in the level of digital use between the interventional and control groups during the post-test phase.

Table – 3: Level of Association between Post-Test exposure to digital use and Socio- Demographic Variables of Participants in Interventional Group (n = 250)

DEMOGRAPHIC VARIABLE	POST TEST EXPERIMENTAL GROUP FREQUENCY (OBSERVED VALUE)			POST TEST EXPERIMENTAL GROUP FREQUENCY (EXPECTED VALUE)			CHI-SQUARE	DEGREE OF FREEDOM	P VALUE	LEVEL OF SIGNIFICANCE
	MILD	MODERATE	SEVERE	MILD	MODERATE	SEVERE				
	D	ATE	RE		RATE	RE				
Class and year										
11th -First Year	60	10	6	65.968	6.08	3.952	14.2342	6	0.0271	SIGNIFICANT
11th -Second Year	70	10	7	75.516	6.96	4.524				
12th-First Year	43	0	0	37.324	3.44	2.236				
12th-Second Year	44	0	0	38.192	3.52	2.288				
Gender										
Male	88	7	8	89.404	8.24	5.356	2.5746	2	0.2760	INSIGNIFICANT
Female	129	13	5	127.596	11.76	7.644				
Age										

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15-16 Years Old	119	7	5	113.70 8	10.48	6.812	68.94 46	2	0.00 00	SIGNIFI CANT
17-18 Years Old	98	13	8	217	9.52	6.188				
Years of Using Digital Gadget										
1-4 Years	97	11	7	99.82	9.2	5.98	1.12 19	2	0.57 07	INSIGNI FICANT
5-8 Years	120	9	6	117.18	10.8	7.02				

Demographic Associations

It depicts the presence of a significant association between socio-demographic variables like Class, Year, and Age post-test level of digital use among adolescents in the interventional group.

- **Age:** Younger adolescents (15–16 years) showed greater reductions in digital use.
- **Class Year:** Students in earlier academic years responded more positively to the intervention.
- **Gender and Duration of Use:** No significant associations were observed, suggesting broad applicability across these variables.

IV. Discussion

These results are consistent with the interventional group's notable decrease in digital use which supports the effectiveness of planned treatments.

The significant reduction in digital use within the intervention group highlights the effectiveness of structured detox programs. The findings align with prior research, such as Roy et al. (2024), which emphasized the role of educational and behavioral strategies in promoting digital well-being. The lack of change in the control group underscores the necessity of proactive interventions to address digital overuse.

This *Psychology of Popular Media study* presents a tool to assess youth's preoccupation with their physical appearance on social media. Researchers administered a 21-item survey about social media to 281 Australian high school students. They identified 18 items with strong inter-item correlation centered on three categories of social media behavior: online self-presentation, appearance-related online activity, and appearance comparison. In a second study with 327 Australian university students, scores on the 18-item survey were found to be associated with measures of social anxiety and depressive symptoms, appearance-related support from others, general interpersonal stress, coping flexibility, sexual harassment, disordered eating, and other issues. The researchers also found that young women engaged in more

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appearance-related social media activity and appearance comparison than did young men.

This study in *Psychological Trauma: Theory, Research, Practice, and Policy* reveals that college students experienced emotional distress on many levels during the COVID-19 pandemic. Researchers surveyed 257 students at a U.S. college who all participated in remote learning off-campus during the spring of 2020 because of the pandemic. Students reported being afraid of contracting COVID-19 and even more afraid of people within their social network contracting the virus. They also reported worrying about themselves or loved ones becoming severely ill, academic-related distress following the transition to remote learning, and COVID-19-related mental health distress, including interpersonal disengagement, struggles with motivation, and boredom, as well as anxiety, depression, and sleep disturbances.

The results are consistent with other studies highlighting the negative consequences of extended computer use on teenagers and the possibility of organized treatments to lessen these effects. In 2021, Samereh Asadi Majereh did research on the impact of 'systematic desensitization and self-regulation on students' internet addiction.' have demonstrated comparable patterns, with behavioral treatments promoting a decrease in screen use and enhancing mental health. Adolescents who use social media apps such as Instagram more frequently than their peers feel closer to their friends, suggests this study in *Developmental Psychology*. Researchers asked 387 adolescents ages 13 to 15 in the Netherlands to report six times per day for 3 weeks their Instagram, WhatsApp, and Snapchat use in the previous hour, as well as their momentary experiences of friendship closeness. They found that participants who used WhatsApp and Instagram with close friends with whom they felt a sense of trust, support, and intimacy more frequently throughout the 3 weeks experienced higher levels of friendship closeness during the study than their peers. However, participants felt less close to their friends after they had used Instagram or WhatsApp in the previous hour, perhaps, the researchers suggest, resulting from unmet expectations that friends would immediately provide feedback on their posts. Neither association was found with Snapchat.

Similar to the current study, earlier research has shown that organized interventions can effectively reduce screen time and mitigate digital usage. A 2024 study by Roy N. Ramadhan et al., titled *Impacts of Digital Social Media Detox for Mental Health: A Systematic Review and Meta-Analysis*, revealed that digital detox programs significantly enhance awareness and control over digital behaviors, especially when paired with instructional strategies.

Implications for Practice

- **Educational Policy:** Schools should incorporate digital detox programs to foster healthier technology habits.

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- **Public Health:** Policymakers should promote community-level initiatives targeting technology addiction among adolescents.
- **Nursing Practice:** Nurses can leverage digital detox frameworks to address mental health concerns related to technology overuse.

Future Research

- Longitudinal studies are needed to evaluate the long-term efficacy of digital detox interventions.
- Comparative analyses across different age groups and cultural contexts would enhance generalizability.
- Mixed-method approaches could provide deeper insights into participants' experiences and perceptions.

V. Conclusion

This study demonstrates the potential of structured digital detox interventions in reducing excessive device use among adolescents. By integrating education, behavioral strategies, and real-time feedback, these programs can significantly improve digital habits and overall well-being. Broader implementation across educational and community settings is recommended to address the rising challenge of digital overuse.

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Conflict of Interest

There is no conflict of interest related to the study.

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