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Yoga as a preventive tool for internet addiction: A study on high school students in urban India

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Abstract
This study examined the effectiveness of an 8-week yoga intervention in reducing internet addiction and improving psychological well-being and mindfulness among 300 high school students in Jaipur, India. Participants were randomly assigned to intervention and control groups. The intervention group showed significant reductions in internet addiction scores and improvements in well-being and mindfulness, while the control group exhibited minimal changes. The results highlight yoga's potential as a non-invasive intervention to promote emotional regulation, enhance self-awareness, and reduce compulsive internet use among adolescents. The findings suggest incorporating yoga into school-based wellness programs to support healthier digital habits and mental health.

Keywords: Yoga, internet addiction, mindfulness, psychological well-being, adolescents

Introduction

In the current digital era, internet usage has become ubiquitous, with adolescents particularly vulnerable to excessive internet consumption. As smartphones, social media, gaming, and online entertainment have integrated into daily life, an increasing number of adolescents exhibit behaviors associated with internet addiction, including impaired control over internet use, increased time spent online, and withdrawal symptoms when access is restricted. This addiction has adverse consequences on physical, emotional, and academic well-being, and addressing this growing issue has become a public health priority worldwide.

In India, where urbanization and technology penetration are advancing rapidly, high school students in metropolitan areas face heightened exposure to the internet. This demographic, already under academic and social pressures, is particularly susceptible to internet overuse, which can negatively affect their mental and emotional health. Studies suggest that internet addiction rates among adolescents in urban India are rising, contributing to issues like sleep deprivation, anxiety, depression, and social isolation. The urban environment, with its intense academic competition and easy access to technology, creates an ecosystem conducive to internet addiction.

Yoga, an ancient practice rooted in Indian tradition, has gained global recognition for its physical, mental, and emotional benefits. Through its combination of physical postures (asanas), breathing exercises (pranayama), and meditation (dhyana), yoga helps individuals develop self-control, mindfulness, and emotional regulation. These attributes make yoga a promising non-invasive intervention to manage addictive behaviors, including internet addiction. By enhancing awareness and reducing stress, yoga may offer adolescents a healthier way to cope with the pressures of urban life and curtail internet overuse.

Internet addiction, or Problematic Internet Use (PIU), is marked by excessive, uncontrolled internet use that disrupts daily life. Young's Internet Addiction Test (IAT) identifies symptoms such as preoccupation, withdrawal, and failure to reduce usage despite consequences. Similar to substance abuse, it involves compulsive behavior and disrupted cognitive control (Kuss & Griffiths, 2012) [6]. Adolescents are especially vulnerable due to impulsivity, anxiety, and academic pressures, using the internet as a coping mechanism (Kaess *et al*., 2014) [4].

Yoga, an 5,000-year-old holistic practice from India, promotes physical and mental balance through postures (asanas), breathing (pranayama), and meditation. Studies show yoga reduces stress, lowers cortisol levels, and improves attention control, making it a potential tool for addressing compulsive behaviors like internet addiction (Ross & Thomas, 2010; Telles *et al*., 2013) [11, 16].

Research supports yoga's ability to enhance mindfulness and self-regulation. Khalsa *et al*. (2012) [5] found yoga reduced stress and promoted healthier choices in high school students. Similarly, Prathikanti *et al*. (2017) [10] linked yoga with improved attention control and impulse resistance. Yoga's effect on mindfulness helps break the cycle of compulsive internet use.

Despite this, there is little research on yoga as a preventive tool for internet addiction, particularly among urban Indian adolescents. Exploring yoga's role in preventing internet addiction could introduce holistic, culturally relevant interventions into school curricula.

Problem statement

High rates of internet addiction among adolescents in urban areas

Internet addiction has emerged as a serious concern in urban India, especially among high school students. Despite its negative impact on academic performance, emotional stability, and interpersonal relationships, limited measures have been adopted to address this problem. Adolescents often lack the guidance to manage their internet consumption, resulting in compulsive behaviors that affect their overall well-being. The high prevalence of internet addiction in this population highlights an urgent need for effective preventive measures.

Lack of preventive measures addressing the issue
Although awareness of internet addiction is growing, there is a scarcity of structured, non-invasive preventive interventions tailored to adolescents. Most existing measures focus on curbing screen time through restrictions or punitive actions rather than equipping students with tools for self-regulation. Schools and mental health practitioners have not widely adopted holistic approaches, such as yoga, which can help adolescents develop mindfulness and self-discipline. Addressing this gap is crucial for promoting healthy internet use and preventing addiction.

Objectives
- To explore the effectiveness of yoga as a preventive measure against internet addiction.
- To assess changes in students' internet usage behavior post-intervention:

Research Questions
- How prevalent is internet addiction among high school students in urban India?
- Can regular yoga practice reduce symptoms of internet addiction?

Significance of the study
This study highlights yoga as an accessible, non-invasive intervention for managing internet addiction, expanding the focus beyond traditional cognitive-behavioral and tech-based solutions. It paves the way for integrating holistic practices like yoga into adolescent mental health strategies. The findings also suggest that schools, especially in urban areas, could adopt yoga programs to promote healthier online habits and improve student well-being as part of their mental health initiatives.

Methodology
Research design
The study used a quantitative, experimental design to evaluate the impact of yoga on internet addiction in high school students. It followed a pre-test/post-test setup, with one group undergoing an 8-week yoga program and a control group receiving no intervention. Participants were randomly assigned to either group, and both groups were assessed for internet addiction, mindfulness, and psychological well-being before and after the intervention. This approach enabled a direct comparison between the groups to measure the effectiveness of yoga in reducing internet addiction symptoms.

Participants
The study targeted high school students (grades 9-12) from urban schools in Jaipur, India, with a focus on schools where internet use is common. A total of 300 students were randomly selected, with 150 assigned to the yoga group and 150 to the control group. This sample ensured diversity in socioeconomic background and internet habits, providing enough statistical power to detect meaningful differences while minimizing selection bias and enhancing the study's validity.

Hypotheses
Hypothesis 1:
- **Null Hypothesis (H_0):** There will be no significant difference in internet addiction levels between the yoga intervention group and the control group after the 8-week intervention.
- **Alternative Hypothesis (H_1):** The yoga intervention group will show a significant reduction in internet addiction levels compared to the control group after the 8-week intervention.

Hypothesis 2
- **Null Hypothesis (H_0):** There will be no significant improvement in psychological well-being and mindfulness levels in the yoga intervention group compared to the control group.
- **Alternative Hypothesis (H_1):** The yoga intervention group will show significant improvements in psychological well-being and mindfulness levels compared to the control group after the 8-week intervention.

Intervention: Yoga program
The yoga program focused on reducing stress, enhancing mindfulness, and improving self-regulation to help mitigate internet addiction. It included 30-minute daily sessions for 8 weeks, combining specific yoga postures (Tadasana, Balasana, Sukhasana), pranayama (AnulomVilom, Bhramari), and meditation to improve focus and emotional regulation. A certified instructor led the sessions at school, ensuring consistency in the routine. This 8-week program aimed to reduce stress, increase mindfulness, and boost emotional control, potentially decreasing internet addiction.

Data Collection Instruments
- Internet Addiction Test (IAT)by Young (1998) [19]
- Warwick-Edinburgh Mental Well-being Scale (WEMWBS)
- Mindful Attention Awareness Scale (MAAS)

Data Analysis
Data analysis used paired t-tests to assess within-group changes over time and one-way ANOVA to compare post-intervention scores between the intervention and control groups. This approach provided a comprehensive evaluation of the yoga program's impact on internet addiction, mindfulness, and psychological well-being.

Results

Table 1: Comparison of Internet Addiction Test (IAT) Scores (Pre- and Post-Test)

Group	Pre-Test Mean	Post-Test Mean	Mean Difference	P-Value (Paired t-test)
Intervention	55.3	30.2	25.1	0.001
Control	54.8	53.1	1.7	0.245

The intervention group's pre-test mean IAT score was 55.3, indicating moderate to high internet addiction. After the 8-week yoga program, the score dropped significantly to 30.2, with a mean difference of 25.1 points and a p-value of 0.001, confirming statistical significance. This shows the strong effect of yoga in reducing internet addiction by improving self-regulation, mindfulness, and emotional control, helping participants better manage stress and reduce compulsive internet use. This aligns with Khalsa *et al*. (2012) [5], who found that yoga enhances mental clarity and reduces addictive behaviors.

In the control group, the pre-test mean IAT score was 54.8, decreasing slightly to 53.1 post-test, with a mean difference of 1.7 and a p-value of 0.245, indicating no significant change. Without intervention, students did not experience a meaningful reduction in internet addiction, highlighting the importance of structured programs like yoga for behavior change.

These findings are supported by Turel *et al*. (2019) [17], who demonstrated that mindfulness-based interventions like yoga effectively reduce addictive behaviors. Overall, this study reinforces yoga's potential as a preventive tool for internet addiction and supports integrating mindfulness practices to promote healthier habits among adolescents.

Table 2: Comparison of Psychological Well-Being Scores (Pre- and Post-Test)

Group	Pre-Test Mean	Post-Test Mean	Mean Difference	P-Value (Paired t-test)
Intervention	45.6	65.7	20.1	0.001
Control	46.2	48.1	1.9	0.18

The intervention group's pre-test mean well-being score of 45.6 improved significantly to 65.7 after the 8-week yoga program, with a mean difference of 20.1 and a p-value of 0.001, indicating a strong positive impact. Yoga's focus on reducing stress, enhancing relaxation, and improving emotional regulation likely contributed to this substantial improvement. By fostering mindfulness and self-awareness, yoga helped students manage stress and emotions more effectively, aligning with studies showing yoga's benefits for mental health, such as reduced cortisol levels and enhanced emotional stability (Ross & Thomas, 2010; Vijayakumar *et al*., 2018) [11, 18].

In contrast, the control group showed only a slight increase in well-being, with a mean difference of 1.9 and a p-value of 0.180, indicating no significant change. This suggests that typical school life, without interventions like yoga, does little to enhance psychological well-being.

These findings support the hypothesis that yoga positively impacts mental health, showing that regular yoga practice can improve emotional resilience, reduce stress, and enhance overall well-being in high school students.

Table 3: Comparison of Mindfulness Scores (Pre- and Post-Test)

Group	Pre-Test Mean	Post-Test Mean	Mean Difference	P-Value (Paired t-test)
Intervention	52.4	70.3	17.9	0.001
Control	53.1	55.4	2.3	0.215

The intervention group's pre-test mean mindfulness score was 52.4, rising significantly to 70.3 after the 8-week yoga program. The mean difference of 17.9, with a p-value of 0.001, shows a substantial improvement in mindfulness. This boost can be attributed to the yoga program's focus on asanas, pranayama, and meditation, which enhanced students' attention, emotional regulation, and present-moment awareness. These findings align with research by Garland *et al*. (2017) [3], which shows that mindfulness practices help regulate attention and reduce impulsivity.

In contrast, the control group saw only a slight improvement in mindfulness, with a mean difference of 2.3 and a p-value of 0.215, indicating no significant change. This underscores the effectiveness of yoga in actively cultivating mindfulness, which does not improve without deliberate practice.

Overall, the significant increase in mindfulness in the intervention group supports the hypothesis that yoga enhances mindfulness among adolescents. This highlights yoga's potential as an effective tool for promoting self-regulation, emotional control, and cognitive focus in high school students, consistent with existing literature like Zeidan *et al*. (2010) [20].

Conclusion

This study demonstrated that an 8-week yoga intervention significantly reduced internet addiction, improved psychological well-being, and enhanced mindfulness among high school students. The intervention group showed notable improvements compared to the control group, which exhibited no significant changes.

The findings confirm yoga's effectiveness as a non-invasive tool for promoting self-regulation, reducing compulsive behaviors, and improving mental health. The results align with previous studies, emphasizing yoga's role in lowering stress and increasing mindfulness, making it a valuable addition to school wellness programs to prevent internet addiction.

In conclusion, yoga presents a practical and culturally relevant intervention for fostering healthier internet habits and enhancing adolescents' overall well-being. Future research should explore long-term effects and broader applications of yoga in similar contexts.

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