



Mindfulness Based Interventions for Improving Sleep Quality and Reducing Digital Addiction among University Students: A Role of Social Case Worker

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Abstract

Students of the University of Punjab, Pakistan are becoming more exposed to poor sleep quality and a high degree of digital addiction, which is very dangerous to their academic achievements and mental well-being. According to research, academic stress, unstable lifestyle, and excessive screen time usually result in getting insufficient or disrupted sleep in university students, which in turn impairs their concentration, causes emotional instability, and reduces their overall well-being. This study to examine the effectiveness of mindfulness-based interventions in improving sleep quality among university students. To assess the impact of mindfulness-based interventions on reducing levels of digital addiction among university students. To explore the role of social case workers in implementing and supporting mindfulness-based interventions aimed at improving sleep quality and reducing digital addiction among university students. The research design used in this study was a quantitative cross-sectional research to investigate the efficacy of mindfulness-based interventions on the sleep quality and digital addiction among university students. The quantitative methodology allowed objective measurement of variables and test of relations statistically. The study population was the university students of both the public and the private universities in Punjab, Pakistan. The respondents of the study were chosen via a total of 370 university students. Multistage sampling method was used, according to which the universities were chosen on the basis of accessibility and the students were chosen out of random sampling. The instruments were based on already validated scales and were made to meet the goals of the study. The answers were all recorded in a Likert-type scale. The data were gathered using online and paper-based questionnaires with the permission of the concerned authorities of the Universities. Statistical Package of the Social Sciences (SPSS) was used to analyze the data collected. To summarize the demographic information the descriptive statistics were applied, to test the hypotheses of the study correlations and regression analyses were performed.

Keywords: Mindfulness, Interventions, Sleep Quality, Digital Addiction,

1. Introduction

The modern generation of university students experiences significant issues regarding the quality of their sleep and the use of digital technologies, and a significant percentage of them report sleeping problems and the need to use digital technologies on a compulsive basis. Academic stress, lifestyle changes, and spending more time in front of a screen are identified as factors that are related to sleep disturbances in this group of

people especially prior to sleep (Hershner and Chervin, 2014). At the same time, the widespread utilization of smartphones, social media, and online gaming also led to the increasing worry about the problem of digital addiction, which can be described as problematic or excessive digital media consumption that disrupts everyday life (Kuss & Griffiths, 2017). These issues are interconnected in such a way that they do not only deteriorate the mental and physical health of students but also negatively affect academic performance and general well-being (Lemola et al., 2015; Twenge et al., 2020).

In Punjab, Pakistan, university students are facing issues pertaining to low quality of sleep and overuse of digital technology whereby it has become a burning issue in terms of mental health and academic standards. Students are also affected by academic pressure, changes in lifestyles, and high rates of digital addiction because of the excessive screen time prior to bedtime (Hershner and Chervin, 2014; Lemola et al., 2015). Psychological distress, lack of self-control, and additional sleep disturbances were linked to digital addiction and the compulsive use of digital devices at the expense of everyday operations (Kuss and Griffiths, 2017; Twenge et al., 2020).

The social case workers seem to be the only in a perfect position to execute and adapt mindfulness-based interventions in university students, being skilled in psychosocial assessment, interventions plan, and holistic care. Through the use of mindfulness in counseling and wellness programs, social case workers can approach the complex nature of sleep issues and digital addiction and take into account socio-environmental factors that cause students to experience stress (Rosen et al., 2018). Additionally, they can contribute to creating conducive campus conditions that can support the use of technology and a healthy sleep routine by their advocacy and resource coordination. The purpose of the present study is to investigate the effectiveness of MBIs in enhancing the quality of sleep and decreasing digital addiction among university students with an emphasis on the importance of social case workers in the process.

1.1 Background of the Study

Students in the university are especially susceptible to lifestyle and psychosocial stressors that lower the quality of their sleep as well as overall well-being, and the stages of transition, including entry into higher education, academic load, and transition to independent living are some of the factors that increase stress and disrupts sleep (Hershner and Chervin, 2014). The quality of sleep in students has consistently been associated with poor cognitive performance, depressive symptoms, and worse quality of life, and enhanced by late-night use of digital media, which disrupts circadian rhythms and enhances mental arousal (Lemola et al., 2015; Twenge, Krizan, and Hisler, 2020).

This negative pattern of excessive use of technology is linked to the rise in psychological distress, deficits in attention, and emotional regulation in university populations (Gupta, Hershner, and Chervin, 2020; Kuss and Griffiths, 2017). Mindfulness-based interventions (MBIs), the strategies that encourage the present-moment mindfulness and nonjudgemental observation of thoughts and sensations, have become popular as evidence-based practices that help enhance self-regulation and reduce stress and psychological functioning (Kabat-Zinn, 1994; Garland, Farb, Goldin, and Fredrickson, 2015). It has been meta-analytically indicated that MBIs may be useful in enhancing the quality of sleep by lowering arousal before sleep and facilitating relaxation, and possibly have a potential in lessening compulsive digital-space use by enhancing attentional control and diminishing impulsivity (Bergomi, Tschacher, and Kupper, 2013; Rusch et al., 2019).

1.2 Statement of the Problem

Students of the University of Punjab, Pakistan are becoming more exposed to poor sleep quality and a high degree of digital addiction, which is very dangerous to their academic achievements and mental well-being. According to research, academic stress, unstable lifestyle, and excessive screen time usually result in getting insufficient or disrupted sleep in university students, which in turn impairs their concentration, causes emotional instability, and reduces their overall well-being (Hershner and Chervin, 2014; Lemola et al., 2015).

Digital addiction also worsens sleep issues because it contributes to the use of devices at night and postponed sleep, further contributing to the development of poor sleep and dependence on technology (Twenge et al., 2020). Although studies on the effects of mindfulness-based interventions (MBIs) on sleep qualities and addictive behavior reduction through self-regulation and stress-reduction methods have been promising, scanty evidence has been done on the co-effect of MBIs on sleep and digital addiction among university students, especially in Pakistan (Kabat-Zinn, 1994; Rusch et al., 2019). Besides, the impact of social case workers in orchestrating and enabling these interventions in university settings is underscored and a gap exists in the combined, evidence-based support systems of student well-being is apparent. Thus, it is highly desirable to examine how MBIs, as social case workers, may be effective in enhancing the quality of sleep and lowering digital addiction in a population of university students in Punjab, Pakistan.

1.3 Hypotheses:

1. **H₁:** Mindfulness-based interventions will significantly improve sleep quality among university students compared to students who do not receive the intervention.
2. **H₂:** Mindfulness-based interventions will significantly reduce levels of digital addiction among university students.
3. **H₃:** University students who receive mindfulness-based interventions facilitated by social case workers will show greater improvements in sleep quality and greater reductions in digital addiction than those who receive mindfulness interventions without structured social case worker involvement.

1.4 Research Questions:

1. What is the effect of mindfulness-based interventions on sleep quality among university students?
2. To what extent do mindfulness-based interventions reduce levels of digital addiction among university students?
3. What role do social case workers play in facilitating the effectiveness of mindfulness-based interventions for improving sleep quality and reducing digital addiction among university students?

1.5 Research Objectives

1. To examine the effectiveness of mindfulness-based interventions in improving sleep quality among university students.
2. To assess the impact of mindfulness-based interventions on reducing levels of digital addiction among university students.
3. To explore the role of social case workers in implementing and supporting mindfulness-based interventions aimed at improving sleep quality and reducing digital addiction among university students.

1.6 Conceptual Framework:

Independent Variables	Dependent Variables
<ul style="list-style-type: none"> • Mindfulness-Based Interventions (MBIs) • Role of Social Case Worker (Moderating / Facilitating Variable) 	<ul style="list-style-type: none"> • Sleep Quality • Digital Addiction

1.7 Conceptualization & Operationalization

1.7.1 Independent Variables

- **Mindfulness-Based Interventions (MBIs):** Structured practices designed to enhance present-moment awareness and self-regulation.

- **Role of Social Case Worker (Moderating/Facilitating Variable):** Professional support that guides, monitors, and strengthens the implementation of MBIs.

1.7.2 Dependent Variables

- **Sleep Quality:** Overall effectiveness and restorative nature of sleep measured by duration, latency, and disturbances.
- **Digital Addiction:** Compulsive and excessive use of digital devices that interferes with daily functioning.

2. Literature Review

Sleep disorders are extremely common in university students and have been attributed to various psychosocial and behavioral attributes. Poor sleep quality is also caused by transitional life stages, academic pressures, and irregular lifestyles that are linked to poor cognitive performance, emotional instability, and low quality of life (Hershner and Chervin, 2014). These sleep issues have been further aggravated by the ubiquitous use of digital media especially at night where exposure to the screen disrupts circadian rhythms and creates an increased mental activity prior to going to sleep (Lemola et al., 2015). Recent findings also posit that persistent sleep disturbance among population groups of students may raise the risks of anxiety, depressive symptoms, and lower academic performance, and it can be inferred that the health of the population is difficult to overlook due to the need to monitor the quality of sleep at universities and colleges (Twenge et al., 2020).

A major behavioral issue presented by the digital generation in the context of misuse or compulsive behavioral tendencies towards smart phones, social networking websites, and online gaming platforms has become prevalent among university students. As a set of behaviors characterized by excessive technology consumption, which distorts everyday life, digital addiction has been linked to less academic concentration, poor face-to-face social lives, and emotional imbalance (Kuss and Griffiths, 2017). The mutual influence of digital addiction and sleep issues is quite alarming especially because excessive technology use at night does not only disturb sleep onset but also increases cognitive and emotional arousal, which in turn makes addictive behaviors even more deeply rooted (Gupta, Hershner, and Chervin, 2020; Twenge et al., 2020). These results can be used to emphasize the interconnection between sleep quality and digital dependency and indicate that interventions to treat one area can positively impact the other.

Mindfulness as the current moment, nonjudgmental awareness of what is being thought, experienced, and felt has also been under increased investigation as a buffer against stress and maladaptive behaviours. Mindfulness practice has been associated with the ability to manage emotions better, less rumination, and less arousal, which are all valuable factors in ensuring better sleep patterns (Kabat-Zinn, 1994; Garland, Farb, Goldin, and Fredrickson, 2015). Moreover, mindfulness is known to improve self-regulatory functions and attentional control, two important psychological mechanisms of reducing compulsive behaviors, such as digital addiction (Bergomi, Tschacher, and Kupper, 2013). These hypothetical and empirical connections justify the application of mindfulness-based interventions (MBIs) as the means of addressing both the sleep quality and problematic technology use among students in universities.

This has been empirically shown to be effective in enhancing sleep outcomes and limitations of maladaptive behaviors in varied populations using MBIs. Systematic reviews and meta-analysis reports show that mindfulness meditation and other related practices positively affect the quality of sleep by decreasing pre-sleep arousal and increasing relaxation (Rusch et al., 2019). Similarly, organized mindfulness courses have been linked with decreases in technology overuse and enhancements in self-control in young adults, which recommends that MBIs can counteract the addictive digital behaviors (Li et al., 2020). Although a lot of this evidence is based on research carried out in Western situations, it can be assumed that psychological processes involved in stress reduction, increased self-awareness, and better regulation of behavior may be applicable regardless of cultural situation, even in the case of South Asian university students.

Although there is increasing evidence on the benefits of mindfulness, there is paucity of literature on how MBIs may be applied within the context of institutional support system especially with the help of psychosocial assessment and intervention trained professionals. Social case workers are well-positioned to introduce mindfulness practice to university counseling and wellness programs because they have the knowledge of assessing individuals individually, developing interventions, and providing holistic care to them (Rosen, Greene, Young, and Tully, 2018). Social case workers can also increase engagement, overcome practice barriers, and promote lasting behavior change by designing MBIs to suit the unique needs of students and targeting the socio-environmental stressors. The studies examining the role of social case workers to aid MBIs are required to inform the contextually relevant intervention models to enhance sleep and decrease cases of digital addiction among university students in Punjab, Pakistan.

3. Research Methodology

3.1 Research Design

The research design used in this study was a quantitative cross-sectional research to investigate the efficacy of mindfulness-based interventions on the sleep quality and digital addiction among university students. The quantitative methodology allowed objective measurement of variables and test of relations statistically. It was also useful in the analysis of the facilitating presence of social case workers in mindfulness interventions.

3.2 Population of the Study

The study population was the university students of both the public and the private universities in Punjab, Pakistan. The rationale behind the selection of this population has to do with the rising rates of sleep disturbances and digital addiction among the students. In order to have diversity, participants of various academic fields and levels of studies were involved.

3.3 Sample Size and Sampling Technique

The respondents of the study were chosen via a total of 370 university students. Multistage sampling method was used, according to which the universities were chosen on the basis of accessibility and the students were chosen out of random sampling. Only students who satisfied the inclusion criteria and willing to take part were used.

3.4 Variables of the Study

Mindfulness-based interventions and social case workers were the independent variables of the study whereas sleep quality and digital addiction were dependent variables. Mindfulness-based interventions were what were called practices that facilitate awareness and self-regulation. The social case workers role entailed professional advice and assistance in undertaking such interventions.

3.5 Research Instruments

The standardized self-report questionnaires were used to gather data on mindfulness practices, sleep quality, and digital addiction as well as the social case worker involvement. The instruments were based on already validated scales and were made to meet the goals of the study. The answers were all recorded in a Likert-type scale.

3.6 Validity and Reliability

In a bid to find content validity, the research tools were scrutinized by psychological and social work specialists. Clarity of items and relevance were evaluated in a pilot study. Cronbach alpha analysis was used as a measure of reliability and showed that all scales had a good internal consistency.

3.7 Data Collection Procedure

The data were gathered using online and paper-based questionnaires with the permission of the concerned authorities of the Universities. The subjects were made aware of the study and guaranteed confidentiality. All the respondents gave informed consent and participation was voluntary.

3.8 Ethical Considerations

The ethical standards were adhered to in the process of the research. The anonymity and confidentiality of the participants were stated and no identifiable data were gathered. Students were told about their right to drop out of the study at any point without any penalty.

3.9 Data Analysis Techniques

Statistical Package of the Social Sciences (SPSS) was used to analyze the data collected. To summarize the demographic information the descriptive statistics were applied, to test the hypotheses of the study correlations and regression analyses were performed. Moderation analysis was used to investigate the role of social case workers.

4. Data Analysis

4.1 Introduction

This chapter gives the statistical analysis of data which was collected among 370 university students in Punjab, Pakistan. It examines how Mindfulness-Based Interventions (MBIs) can improve the quality of sleep and reduce digital addiction and how social case workers can facilitate these results. The SPSS was used to examine the data in terms of descriptive statistics, correlation, regression, and moderation analysis.

Table 4.1: Descriptive Statistics of Key Study Variables (N = 370)

Variables	Mean	Standard Deviation (SD)	Minimum	Maximum
Sleep Quality (Higher = Better)	3.05	0.74	1.20	4.80
Digital Addiction (Higher = More Addicted)	3.60	0.81	1.00	5.00
Mindfulness Practice (MBIs)	3.20	0.68	1.10	4.90
Social Case Worker Support	3.00	0.72	1.00	4.80

Interpretation

The descriptive statistics shows that the mean sleep quality among the students of the university is moderate (M = 3.05), which means that the students get average sleep quality of restorative sleep. The average score in the digital addiction is comparatively high (M = 3.60), which reveals that a considerable proportion of students demonstrate significant indicators of obsessive use of technologies. The mean score of mindfulness practice (M = 3.20) indicates medium levels of mindfulness-based activities. On the same note, the average score (M = 3.00) of social case worker support means that the students are provided with moderate outcomes of professional support but it can be enhanced. The standard deviations indicate that there is a reasonable fluctuation in responses, which implies that there is different experience among students. On the whole, the data indicate that digital addiction is even more of an issue than sleep quality, and that mindfulness and professional assistance are moderately well-represented among students.

Table 4.2: Pearson Correlation among Study Variables

Variables	1	2	3	4
1. Sleep Quality	1			
2. Digital Addiction	-0.52	1		
3. Mindfulness Practice	0.46	-0.49	1	
4. Social Case Worker Support	0.38	-0.42	0.54	1

p < 0.01

Interpretation

The findings of correlation show that there is a significant negative correlation between digital addiction and sleep quality ($r = -0.52, p < 0.01$), meaning that the greater the digital addiction, the worse the sleep quality. This explains the hypothesis that the pattern of sleep is interrupted by excessive screen time and obsessive use of devices. Mindfulness training has a strong positive relationship with the quality of sleep ($r = 0.46, p = 0.01$) which indicates that students who practice mindfulness get a better sleep. Mindfulness on the other hand has a very negative relationship with digital addiction ($r = -0.49, p < 0.01$) which means that mindfulness alleviates compulsive use of digital media. There is a positive correlation between social case worker support and sleep quality ($r = 0.38, p < 0.01$) and a negative correlation between these two variables and digital addiction ($r = -0.42, p < 0.01$), which means that professional advice can lead to healthier sleep behavior and less digital addiction. In addition, social case worker support has a close correlation with mindfulness practice ($r = 0.54, p < 0.01$), and it should be highlighted that it is associated with encouraging and maintaining mindfulness interventions.

Table 4.3: Regression and Moderation Analysis (Role of Social Case Worker)

Model 1: Predicting Sleep Quality

Predictor	B	SE	β	t	P
Mindfulness Practice	0.42	0.05	0.41	8.40	<0.001
Social Case Worker Support	0.28	0.06	0.24	4.67	<0.001
Mindfulness \times Social Case Worker	0.12	0.04	0.11	3.00	0.003

R² = 0.42, F(3, 366) = 88.2, p < 0.001

Model 2: Predicting Digital Addiction

Predictor	B	SE	β	t	P
Mindfulness Practice	-0.39	0.05	-0.38	-7.80	<0.001
Social Case Worker Support	-0.25	0.06	-0.21	-4.17	<0.001
Mindfulness \times Social Case Worker	-0.11	0.04	-0.10	-2.75	0.006

R² = 0.39, F(3, 366) = 78.4, p < 0.001

Interpretation

Regression findings show that mindfulness practice is a significant predictor of a higher quality of sleep ($b = 0.41, p < 0.001$) and a reduced level of digital addiction ($b = -0.38, p < 0.001$). This validates both Hypotheses 1 and 2 showing that MBIs enhance sleep and decrease compulsive use of digital devices. Social case worker support is also a significant predictor of better sleep ($b = 0.24, p < 0.001$) and a less addicted digital person ($b = -0.21, p < 0.001$), which is vital in the success of the interventions that are professionally facilitated. Notably, the interaction term (Mindfulness \times Social Case Worker) is significant with regard to the sleep quality ($b = 0.11, p = 0.003$) and digital addiction ($b = -0.10, p = 0.006$). It shows that the presence of social case workers enhances the beneficial outcomes of mindfulness, which results in improved sleep and increased digital

addiction reduction. Thus, Hypothesis 3 is accepted: the results of mindfulness intervention with the assistance of social case workers are more beneficial than those of mindfulness.

5. Discussion

The paper establishes that students of higher educational institutions can be susceptible to sleep disorders and internet addiction because of academic stress, changes in lifestyles, and screen time overload. Digital addiction was high ($M = 3.60$), and the quality of sleep was moderate ($M = 3.05$), which is a cause of serious behavioral concern. The negative correlation ($r = -0.52$, $p < 0.01$) between an increased level of digital addiction and poorer sleep is significant. This helps to support the assumption that sleep issues and digital addiction are interrelated, and they form a vicious cycle.

The regression findings indicate that mindfulness-based interventions (MBIs) can significantly enhance the quality of sleep ($b = 0.41$, $p < 0.001$) and decrease the state of digital addiction ($b = -0.38$, $p < 0.001$), which proves the first two hypotheses. MBIs are beneficial in reducing arousal in the pre-sleep period, improving relaxation, and improving self-control, which overcomes sleep and reduces compulsive use of digital device. Mindfulness-based practice allows students to be aware of how they use their devices automatically, control cravings, and use more healthy coping methods, which makes it an efficient intervention in higher education institutions.

It is also indicated in the study that the effects of MBIs are reinforced by the presence of social case workers. Social case worker assistance had a significant predictive value on sleep improvement ($b = 0.24$, $p < 0.001$) and reduced digital addiction ($b = -0.21$, $p < 0.001$) and the interaction was also significant. This implies that professional instruction increases the interaction and compliance with mindfulness practices and results in improved outcomes. On the whole, the outcomes prove the Hypothesis 3 and underline that the combination of MBIs and the social case worker support could be successfully used to enhance student well-being and academic performance.

6. Conclusion

The paper confirms that there are high levels of sleep difficulties and digital addiction amongst university students in Punjab, Pakistan, which are much caused by academic stress, lifestyle changes, and excessive use of screens. Although the quality of sleep was moderate, digital addiction was proven to be quite significant, which supports the necessity of interventions. The correlation in the negative direction between the digital addiction and the quality of sleep shows that there is a cyclical effect whereby, the more individuals are addicted to technology, the more they spoil their sleep and the less they sleep, the more addicted they are. These results highlight the importance of the comprehensive approach to correct the situation with both problems and help students achieve better results and become healthier.

The findings are a clear indication that mindfulness-based interventions (MBIs) can be used to enhance the quality of sleep and lessen digital addiction among college students. The first two hypotheses were significant since mindfulness practice was one of the strongest predictors of improved sleep and reduced digital addiction. This implies that mindfulness improves self-regulation, lessens pre-sleep arousal, and brings about emotional stability, which will help students to cope with stress and regulate their use of technology that is compulsive. All in all, MBIs become one of the powerful interventions aimed at improving restorative sleep and decreasing the levels of digital dependency in college campuses.

The paper also mentions the importance of the social case workers to the effectiveness of MBIs. The third hypothesis was confirmed as social case worker support is the factor that predicted not only better sleep and less digital addiction but also enhanced the beneficial outcome of mindfulness. Professional advice contributes to enhanced involvement, regular practice, and personal and situational change barriers. Thus, implementing MBIs in support systems of universities by employing trained social case workers can offer a long-term, evidence-based intervention to enhance student health and academic performance.

7. Recommendations

1. Bring organized mindfulness-based intervention (MBI) programs to university wellness services in an effort to enhance student sleep and self-control.
2. Train social case workers to be mindfulness facilitators that will offer guided support and enhance adherence to interventions.
3. Introduce a regular mindfulness practice (e.g., weekly) in the university counseling centers to decrease digital dependency and stress.
4. Design digital detox and sleep hygiene sessions with social case workers to create awareness on sleep disruption due to technologies.
5. Institute sleep issues and digital addiction screening instruments at the orientation of the students to detect the high-risk individuals in advance.
6. Educate universities to establish mindfulness peer-led clubs to improve the level of engagement and sustainability.
7. Introduce mindfulness training in school or extracurricular activities in order to develop long-term regulation skills regarding emotions.
8. Offer individual mindfulness counseling to students with extreme digital dependence or sleep disorders by social case workers.
9. Do follow-up assessment and monitoring by social case workers to check on progress and revise intervention plans where necessary.
10. Encourage university administration, faculty and social case workers to work together to establish a conducive atmosphere of healthy digital usage and sleep habits.

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