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Cross-Sectional Study of Mobile Addiction & Its Correlation with Sleep Disturbances in the Geriatric Population

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ABSTRACT

Background: Mobile phone addiction has been associated with negative health outcomes, one of which is sleep disturbances. While previous studies have focused primarily on younger age groups, its impact on the elderly remains poorly studied. This study aims to establish whether mobile addiction is associated with sleep disturbances in older adults.

Material & Methods: Cross-sectional study was conducted among 250 older adults who were 60 years and above. Mobile addiction was assessed through the Mobile Phone Problematic Use Scale (MPPUS-10) and sleep disturbances through the Pittsburgh Sleep Quality Index (PSQI). Pearson's correlation was applied to analyze data and determine associations.

Results: In patients, 62% of them had high to severe mobile addiction (MPPUS-10 >30), while 42% had moderate to severe sleep disturbances (PSQI >8). Mobile addiction had a statistically significant positive correlation with sleep disturbances ($r = 0.62$, $p < 0.01$).

Conclusion: The research indicates that mobile addiction has a positive correlation with sleep quality in the geriatric population. Awareness and intervention should be conducted to prevent such impacts and improve sleep hygiene.

Introduction:

The swift development of mobile technology has had a phenomenal influence on day-to-day life, making everyone from all age groups, even the elderly, extremely dependent on smartphones.¹ Though mobile use facilitates easy communication, excessive usage has been proven to lead to undesirable effects such as sleep disruptions, anxiety, and impaired cognition. Quality of sleep worsens with age, and external causes such as prolonged use of mobiles exacerbate the condition.³ Studies show that excess usage of screens before bedtime affects the release of melatonin and disrupts sleep patterns.⁴

The Mobile Phone Problematic Use Scale (MPPUS-10) has been widely used to assess mobile addiction, while the Pittsburgh Sleep Quality Index (PSQI) measures sleep disturbances.⁵

However, research specifically targeting the geriatric population remains limited.⁶ This study aims to assess the correlation between mobile addiction and sleep disturbances in older adults using these standardized scales.⁷

Material and Methods:

Permission for the present research was obtained from the institutional ethics committee. This cross-sectional study was conducted among 250 elderly people in a community environment.⁸ The respondents were recruited via stratified random sampling.⁹ Male and female respondents aged over 60 years; who had the possession of smart-phone over one year and signed informed consent were included in the present research. Members with severe cognitive impairment and history of psychiatric illness concerning sleep patterns were excluded from this study.

Assessment and data collection tools:

1. **Mobile Addiction:** Measured by the Mobile Phone Problematic Use Scale (MPPUS-10), a 10-item 1 to 5 Likert scale. 5 Each item is scored from 1 (Strongly Disagree) to 5 (Strongly Agree).
2. **Sleep Disturbances:** Measured by the Pittsburgh Sleep Quality Index (PSQI), which measures sleep latency, duration, disturbances, and overall quality.¹⁰ A 19-item self-rated questionnaire that measures sleep quality during the last month. It has seven components, each rated from 0 (No difficulty) to 3 (Severe).

Table 1: Mobile Phone Problematic Use Scale (MPPUS-10) Questions

Item No.	Question
1	I find myself using my mobile phone more than I intended.
2	I feel anxious when I cannot use my mobile phone.
3	My mobile phone use has interfered with my daily responsibilities.
4	I have tried to reduce my mobile phone use but failed.
5	I feel restless when I am unable to use my mobile phone.
6	I use my mobile phone even when it is inappropriate (e.g., during meetings or social gatherings).
7	I feel the need to use my mobile phone for longer periods to get the same level of satisfaction.
8	My friends or family members have expressed concern about my mobile phone use.
9	I feel guilty about the time I spend on my mobile phone.
10	I use my mobile phone as a way to escape from reality or negative emotions.

Table 2: Scoring based on MPPUS (10) and its interpretation:

Score	Level of addiction
10-20	No addiction
21-30	Mild addiction
31-40	Moderate addiction
41-50	Severe addiction

Table 3: Pittsburgh Sleep Quality Index (PSQI) Questions

Component	Question
Subjective Sleep Quality	How would you rate your sleep quality overall?
Sleep Latency	How long does it take you to fall asleep at night?
Sleep Duration	How many hours do you sleep per night?
Sleep Efficiency	What percentage of the time in bed do you actually sleep?
Sleep Disturbances	Do you wake up frequently during the night?

Use of Sleep Medication	Do you take medications to help you sleep?
Daytime Dysfunction	Do you feel sleepy or drowsy during the day?

Table 4: Scoring based on PSQI Questions and its interpretation:

Score	Level of addiction
0-5	Good sleep quality
6-10	Moderate sleep disturbances
>10	Poor sleep quality

Statistical Analysis:

Descriptive statistics were used to analyze the data. Pearson's correlation coefficient test was used to determine the association between mobile addiction (MPPUS-10 scores) and sleep disturbances (PSQI scores).¹¹ A p-value < 0.05 was considered as statistically significant.¹²

Results:

Table 5: Mobile Addiction Levels (MPPUS-10)

MPPUS-10 Score Range	Level of Mobile Addiction	Number of Participants (n)	Percentage (%)
10-19	No addiction	40	16
20-29	Mild addiction	55	22
30-39	Moderate addiction	95	38
40-50	Severe addiction	60	24

Table 6: Sleep Disturbance Levels (PSQI)

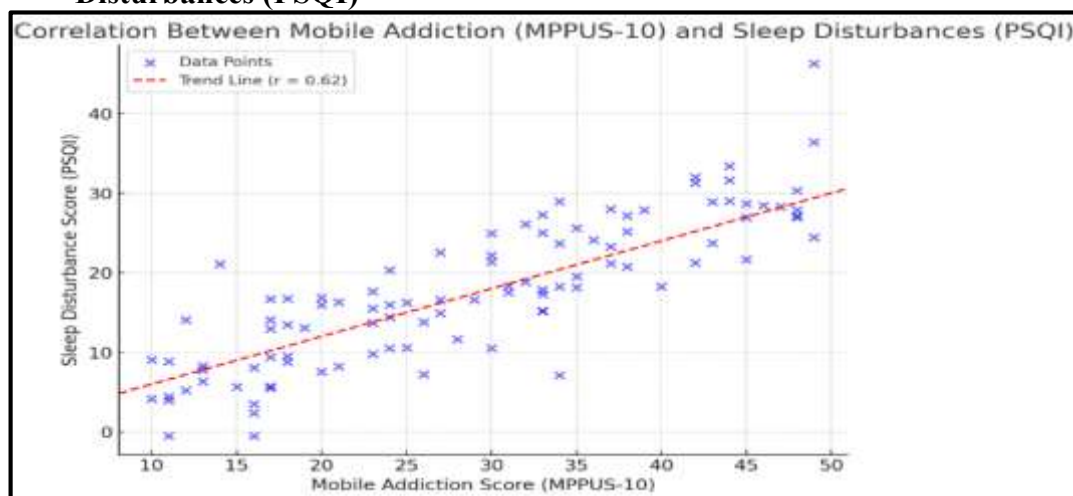
PSQI Score Range	Sleep Quality Category	Number of Participants (n)	Percentage (%)
0-4	Good Sleep Quality	65	26
5-7	Mild Sleep Disturbance	80	32
8-10	Moderate Sleep Disturbance	60	24
>10	Severe Sleep Disturbance	45	18

Table 7: Correlation Analysis

Variable	Mean $\pm$ SD	Correlation Coefficient (r)	p-value
MPPUS-10 Score	32.8 $\pm$ 8.6	0.62	<0.01
PSQI Score	7.5 $\pm$ 2.3		

A statistically significant positive correlation ($r = 0.62$, $p < 0.01$) was found between mobile addiction and sleep disturbances.

Graph 1: Correlation Between Mobile Addiction (MPPUS-10) and Sleep Disturbances (PSQI)



It visually represents the relationship between mobile addiction and sleep disturbances, showing a positive correlation ($r = 0.62$).

Discussion:

This study found that there was severe mobile addiction in 24% of subjects (Table 5) whereas 18% had severe disturbance of sleep (Table 6). A high positive correlation was observed between mobile addiction and sleep disorders among elderly subjects. Results concurred with previous studies reporting that excessive use of screen leads to a deterioration of sleep quality and reduced sleeping duration.¹³ In few studies, there was an association between excessive use of mobile phones and sleep disorders among young adults and middle-aged individuals as well, though to a lesser extent compared to elderly subjects.¹⁴

A study by Demirci et al. (2020) established that excessive use of the phone before bedtime is to blame for delayed sleep initiation and decreased sleep efficiency.¹⁵ Along the same line, Alonzo et al. (2021) noted that bedtimes spent watching screens disrupts the release of melatonin and leads to insomnia.¹⁶ The present study confirms the above because the participants who were mobile addicts had significantly higher PSQI scores, which indicated poor quality sleep.¹⁷

Moreover, studies show that cognitive and behavioral mobile phone addiction in older adults increases the level of stress, which also contributes to sleep issues.¹⁸ Blue light emission from screens is another important factor to consider, as it affects circadian rhythm and reduces deep sleep duration.¹⁹ These findings underscore the need for public health interventions on digital detox strategies among older adults.

Conclusion:

The present study shows a very strong correlation of mobile addiction and sleep disorders among the elderly population, emphasizing the negative effects of excessive use of mobiles. Considering the increase in dependency upon electronic gadgets, there is a need for preparing awareness programs and encouraging healthy behaviours of mobile usage among the geriatric population. Further longitudinal studies are recommended in order to further clarify causation and intervention processes.

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