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Prevalence of Digital Media Dependence, Sleep Disturbance, and Social Interaction Patterns among Indian Paramilitary Personnel: A Descriptive Cross-Sectional Study

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Abstract

Objectives: This research aims to identify a relationship that exists between the Psychological Well-Being of Paramilitary Personnel and their Dependency on Digital Media and on the effects of using the Internet on their Sleep Patterns and Social Interactions. **Methods:** A cross-sectional survey was carried out to obtain information from 500 active paramilitary personnel in India. Most participants were between 26-45 years old and accounted for 82.6% of the total sample size of 500. The 75.4% of respondents were male, and represent the demographic make-up of the paramilitary personnel regarding the operational forces. Data collection occurred via structured questionnaires which assessed internet dependency, sleep disruptions, and preferences for social interactions. **Findings:** The findings show that excessive internet use occurred with greater frequency than anticipated; 43% of respondents reported this. In addition, 49% of respondents reported frequently experiencing urges to check social media; 36.4% of respondents reported that their internet usage interfered with their responsibilities; 53.4% of respondents reported having sleep difficulties attributable to using the internet; 58.2% of respondents reported having poor sleep quality following use of the internet at night; 50.6% of respondents reported having a reduced amount of sleep as a result of engaging in online activities; 49.4% of respondents reported preferring to interact with others over the internet rather than in person; and 49.8% of respondents reported feeling lonely despite being able to stay connected through the use of the internet. **Novelty:** The findings from this study provide item-level quantitative data regarding dependence and sleep, and provide valuable insight into certain social domains within the work environment of high-stress paramilitary workers. Through this study, we can further develop targeted digital hygiene and sleep protection interventions for the enhancement of resilience in high-stress paramilitary work environments.

Keywords: Digital media dependence; Psychological well-being; Paramilitary forces; Sleep disturbance; Social interaction; Digital hygiene

1 Introduction

Digital dependence among occupational groups characterised by high-stress work environments is increasing⁽¹⁾. Problematic use of a digital system has been linked to psychological distress and decreased levels of well-being⁽²⁾. The library of scholarly work on problematic use has expanded, which can be demonstrated through mapping studies and bibliometric reviews of the literature⁽³⁾. The expansion of themes relating to digital addiction is also evident from studies that utilise science-mapping techniques⁽⁴⁾. Sleep disturbances remain the most common pathway that connects dependence to distress⁽⁵⁾. Late-night use of a device may have negative effects on recovery time and cognitive readiness for the next duty shift⁽⁶⁾. Furthermore, social disconnection diminishes the ability of operationally stressed populations to utilise their coping mechanisms⁽⁷⁾. Previous studies have indicated that the armed forces have experienced techno-pathological behaviour patterns⁽⁸⁾. Recent paramilitary research has shown that problematic use of digital devices creates resilience challenges⁽⁶⁾. Recent paramilitary research has shown that social disconnection occurred alongside problematic digital device use⁽⁹⁾. However, most of these studies do not compare specific duty units at the item level across the participant sample. This work fills this gap by presenting a series of analyses of the chapter-based primary data collection.

2 Methodology

2.1 Study Design

A descriptive cross-sectional survey design was utilized to conduct a systematic using the survey method to assess an individual's behaviours⁽¹⁰⁾. This type of survey allows an individual's Digital Dependence and Psychological Well-Being indicators to be measured simultaneously⁽³⁾. Cross-sectional methodologies are useful for identifying occupationally related patterns of Mental Health⁽⁸⁾.

2.2 Sampling Strategy

All active paramilitary personnel in India needed to be in the study target population. Participants were recruited during a six-month data collection period. To reflect the diverse occupational contexts of paramilitary personnel, multiple paramilitary forces were studied including BSF (Border Security Force), CISF (Central Industrial Security Force), CRPF (Central Reserve Police Force), SSB (Sashastra Seema Bal), AR (Assam Rifles) and ITBP (Indo-Tibetan Border Police). Units were recruited from all over India and through multiple types of active duty. Recruitment of participants also was purposeful, meaning that participants included only those who had operational experience while on active duty⁽⁸⁾. Stratification by force reduced any over-representation of any single group. A sample of 500 respondents allowed for accurate estimations of prevalence rates to be made. The sample size of 500 allowed for accurate comparison of the subgroup across the various forces and demographic groups. The sample also provided estimates of the proportion of all respondents who were in mid-career age range (approximately half of the sample) and was helpful when establishing validity within the research. The overall strategy balanced feasibility and operational diversity and was deemed rigorous⁽⁸⁾,⁽¹⁰⁾.

2.3 Participant Characteristics

The study's participants were representative of many age ranges, levels of education, and paramilitary units. Most were mid-career workforce participants; this reflects the demographics of the mid-career workforce in operational activities⁽¹¹⁾. The distribution of participants by gender reflects the structural composition of paramilitary forces, as seen in previous studies⁽⁸⁾. The participants' educational background aids in interpreting their digital behaviours⁽¹²⁾.

2.4 Research Instruments

Utilising a self-completed questionnaire with 36 items and a validated content review by experts⁽¹³⁾, the instruments consist of 12 items relating to Behavioural Dependence, 9 items related to Sleep Outcomes, 8 Items relating to Psychosocial Functioning and 7 items relating to Emotional Health. Some sample items include "I experience a constant desire to check social media throughout the day" and "My sleep has been affected due to the use of the internet late into the night"⁽⁷⁾. Health-related items included sleep onset time, quality of sleep, and fatigue experienced the following day⁽⁵⁾. Each question's responses were given point values on a 5-point scale, with scores ranging from 1 (Strongly Disagree) to 5 (Strongly Agree)⁽¹⁰⁾.

2.5 Instrument Validation

Ensured content validity by aligning with previously established digital addiction frameworks⁽³⁾. All domains of the questionnaire had relevance to, and were identified as constructs, in bibliometric and mapping studies⁽⁴⁾. Pilot-testing with 30 paramilitary personnel provided assurances that the wording of the survey was clear, appropriate for the population of paramilitary respondents, and relevant to their context. Cronbach's alpha coefficient was used to assess internal consistency reliability, and results indicated that the overall scale had acceptable reliability ($\alpha = 0.84$)⁽¹⁰⁾.

2.6 Data Collection Procedure

Data collection was performed using a self-completed, 36 item direct question/answer format questionnaire regarding emotional health, psychosocial functioning, sleep outcomes and behavioural dependence on technology. Participants were instructed to complete the survey only during non-working hours, which limited any possible effects of their jobs on completing the questionnaire. Responses were obtained independently of any kind of supervision or performance pressure. Some example items from the questionnaire included: "I have a strong desire to check social media several times each day" and "I have trouble sleeping due to using the internet until late at night". All surveys were first screened for completeness before any of the responses were being included in the final analysis.

2.7 Control Measures

To protect anonymity of participants and to prevent them from being identified on the basis of names, service numbers, or unit identifiers these types of identifiers were excluded⁽⁸⁾. To reduce bias of interviewers and improve response consistency, uniform instructions were provided⁽¹⁰⁾. The only responses that appeared in the final dataset were complete and valid responses.

2.8 Statistical Analysis

The coding and analysis of data were performed using the IBM SPSS Statistics (version 26.0), and Microsoft Excel 2019. The statistical techniques used for analysis were frequencies, percentages, means, and Standard Deviations (SD)⁽¹⁰⁾. Statistical analysis included an overall agreement proportion, which used the response categories of "Agree" and "Strongly Agree"⁽³⁾. One sample t-tests were computed to determine the difference between each mean score and the neutral score (3.00) using two-tailed tests at the 95% confidence level.⁽¹⁰⁾

2.9 Methodological Rigor

Using this methodology provided greater transparency, replicability and consistent analyzation throughout all phases of the process. The analysis of items allowed for a much more precise manner in which behaviour risk patterns could be identified⁽¹⁴⁾. The methodology will allow for the future development of digital hygiene intervention intended to target specific behavioural patterns⁽¹⁵⁾.

3 Results and Discussion

3.1 Sample profile snapshot

The majority of respondents had completed Intermediate and Graduate levels of education (Table 1). Forty percent of the total number of respondents were at the Intermediate education level, while 27.4 percent were at the Graduation level. Thus, it can be concluded that a moderately educated operational workforce exists based on the education level of the majority of respondents. The educational distribution for the surveyed operational workforce is consistent with previous research conducted⁽¹¹⁾.

The operational age group represented by the majority of study participants was 26-45. Mid-Career staff composed the greatest representation of the sample and is indicative of current operational deployment trends. More than 40% of persons participated in this study have had between 11-20 years of service. While deployed, personnel also experienced extended periods away from their families. It is within this context of military service and long-term deployments that the use of digital technologies and disrupted sleeping patterns can be better understood.

Table 1. Socio-demographic and service profile of participants (N = 500)

Variable category	Sub-category	n	Percentage (%)
Educational qualification	Matric / 10th	133	26.6
	Intermediate / 12th	200	40.0
	Graduation	137	27.4
	Masters	26	5.2
	Others	4	0.8
Age group (years)	18–25	25	5.0
	26–35	190	38.0
	36–45	198	39.6
	46–55	46	9.2
	56–60	41	8.2
Years of service	≤10 years	112	22.4
	11–20 years	209	41.8
	21–30 years	128	25.6
	>30 years	51	10.2
Duration away from family	≤3 months	93	18.6
	4–6 months	164	32.8
	7–12 months	152	30.4
	>12 months	91	18.2

3.2 Dependence indicators and functional interference

A large proportion of sample responses indicated a high level of unintentional overuse (Table 2). A significant number of participants endorsed using the Internet for psychological escape. Many participants showed a great need to check their social media while going about their daily activities, and their operational duties were disrupted due to their functional interference.

Table 2. Key dependence and interference indicators (N = 500)

Indicator statement	Agree (%)	Strongly agree (%)	Combined (%)
Time online exceeds intention	37.6	5.4	43.0
Internet used to escape challenges	36.4	6.8	43.2
Strong urge to check social media daily	42.0	7.8	49.8
Use continues despite interfering with activities	42.2	5.0	47.2

Eight diagnostic criteria are generally used to determine problematic internet use, with dependence indicated by the presence of at least six. The participants in this study demonstrated elevated levels on four of these criteria: excessive use, loss of control, sleep disturbance, and psychosocial impairment. While this does not reach the diagnostic threshold for dependence, it does suggest that these individuals are at an increased risk of developing internet dependence. Adult addiction research has also found similar patterns⁽¹⁰⁾.

3.3 Social connection patterns and isolation risk

49.4% of respondents expressed a preference for virtual versus physical meetings according to the totals of their agree and strongly agree responses, where this item was the one measuring their views about engaging in face-to-face versus online interactions. This trend threatens the legitimacy of interpersonal social support systems during periods of stress. Studies conducted by Husain⁽¹⁶⁾ and Naif⁽⁷⁾, indicate that similar trends are developing regarding isolation effect experiential findings.

3.4 Sleep disruption patterns linked to late-night internet use

There was a significant association between excessive internet use and disrupted sleep patterns (Table 3). Widespread reports of delayed falling asleep and poor sleep quality were found. Reduced rejuvenation after sleeping was also common. These results support established frameworks linking sleep disruption and internet addiction⁽¹⁴⁾.

Table 3. Sleep-related outcomes associated with internet use (N = 500)

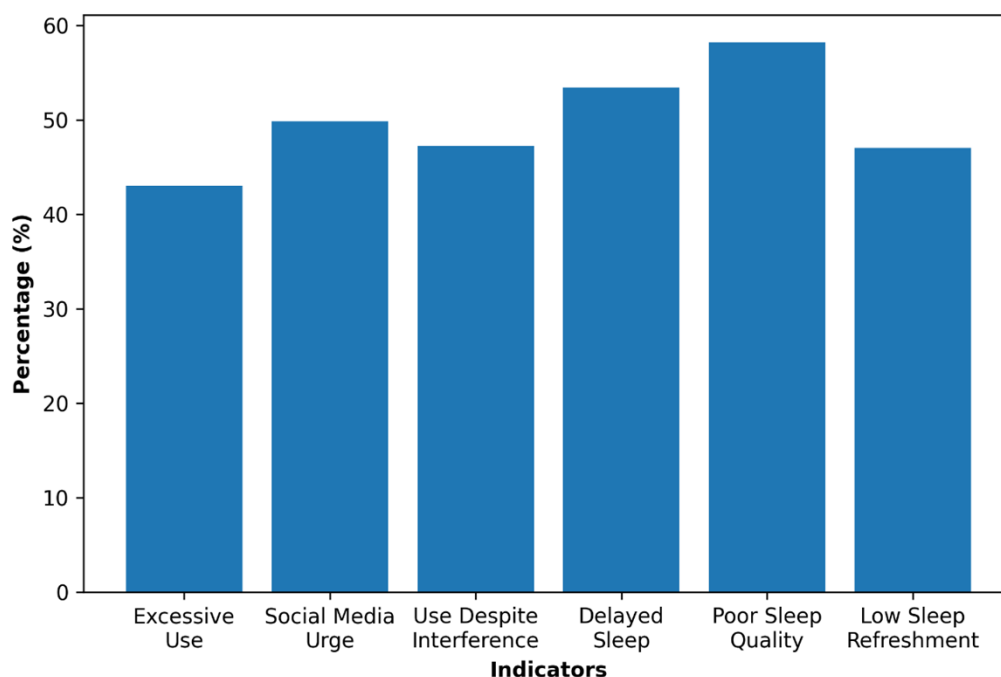
Sleep outcome statement	Agree (%)	Strongly agree (%)	Combined (%)
Falling asleep delayed due to internet use	44.0	9.4	53.4
Sleep quality poor after late-night internet use	46.6	11.6	58.2
Waking refreshed less common after late-night use	34.4	12.6	47.0
Staying up late causes tiredness next day	39.0	4.2	43.2

3.5 Superiority and Novelty Versus Prior Claims

Previous studies focused on the relationships between behaviours and accumulation of evidence, without providing a comprehensive overview of prevalence with regard to the item-level or total number of individuals in each of the areas of dependence⁽⁵⁾, sleep problems⁽⁷⁾, and social interaction problems⁽¹⁴⁾. A unique contribution of the current analysis is its provision of more detail in each of these areas, namely, dependence on, sleep problems due to, and problems with, interactions⁽¹⁰⁾. The item-level data also aids in the development of targeted interventions to address psychological behaviours and behaviours related to occupational environments that are stressful and regulated⁽¹⁵⁾.

The reliance on technology fact increases the risk of engaging in digital device use for extended periods of time during the late night⁽¹⁶⁾. Digital device use during the late night has been shown to interfere with sleep onset and decrease the overall quality of sleep as perceived by the user⁽⁵⁾. Disrupted sleep also impeded emotional recovery, reducing the ability of workers to tolerate stress⁽⁷⁾. Reduced resilience can contribute directly to reduced psychological well-being⁽⁶⁾. Research indicates that the preference for communicating using digital devices rather than through face-to-face contact reduces the ability of individuals to receive face-to-face social support⁽⁷⁾.

Figure 1 compiles endorsement patterns identified in Tables 2 and 3⁽¹⁴⁾. Each bar displays the combined proportion of those agreeing or strongly agreeing with the response options⁽¹⁰⁾. High endorsement indicates that there is a continued level of behaviour despite having some level of functional impairment⁽¹⁵⁾. As a result, the profile indicates similarity of the responses for "indicators of digital dependency" and "sleep disturbance"⁽⁹⁾.

**Fig 1.** Summary Indicator Profile for Key Digital Dependence and Sleep Outcomes

4 Conclusion

This research evaluated the effects of digital addiction on Indian paramilitary officers. Approximately 50% of respondents indicated experiencing digital cravings and various disruptions to regular life due to their use of social media. Sleep disruptions were reported to affect over half of the participants based on the primary outcome measures. In addition to descriptive statistics, one-sample t-test comparisons showed that mean scores for the various items related to addiction, sleep, and social interaction were significantly greater than the neutral benchmark, which suggests systematic movement towards problematic usage. The objectives of this research were met through mapping the patterns of behaviour linked to addiction, sleep disturbance, and engagement with social media. One of the key contributions of this study was the comparison of item-level prevalence data across each of the outcome domains, including support from inferential analysis. Future intervention programmes should therefore focus on improving digital hygiene, protecting sleep, and fostering stronger offline relationships. Limitations of this study include reliance on self-reported data and not being able to infer causality due to the cross-sectional design; therefore, future research should incorporate longitudinal monitoring with unit-based intervention studies.

4.1 Data availability statement

All analysed frequencies and percentages are derived from the author's research.

4.2 Details of Ethical clearance

The author did not seek any formal ethical approval for this project as the guidelines of the institution to which he belongs specify that non-interventional survey-style research (which is what this was) does not require ethical clearance.

This study involved the collection of data using a structured questionnaire approach. There were no clinical trials, lab experiments, or therapeutic interventions performed in this investigation.

The questions asked were all related to how much people use technology, the way they sleep, and how they feel psychologically. No sensitive operational data, classified information, or secure details were collected.

Participation was completely voluntary, and participants provided their consent through their participation in this research. They also had the ability to withdraw from the survey at any point.

No personal identifiable information (such as name, service number, and unit) was captured. Anonymity was strictly maintained throughout the entire data gathering and data analysis process.

All responses were treated as confidential and used for academic purposes only. The study complied with ethical principles that govern minimal risk social research.

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