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Research Article

A Cross-Sectional Survey Study to Assess the Smart Phone Usage and Academic Performance in Medical Professional Students at National Institute of Ayurveda, Jaipur

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ABSTRACT

Introduction: Smartphones are integral to modern life, but excessive use can lead to addiction, affecting mental and physical health, especially in youth. While many studies examine smartphone use among college students, research on medical professional students remains limited. This study aims to bridge this gap by evaluating the impact of smartphone usage on the academic performance of medical students at the National Institute of Ayurveda, Deemed University, Jaipur, Rajasthan. The primary objective of this study is to assess the influence of smartphone usage on the academic performance of medical professional students at the National Institute of Ayurveda, Deemed University, Jaipur, Rajasthan. **Materials and Methods:** A two-year cross-sectional survey was conducted among 550 randomly selected medical students (255 males, 295 females, aged 18-50). A structured questionnaire assessed smartphone usage and its perceived academic impact, with data analyzed using Excel. **Results:** Most of the participants were females (53.64%). Among the various uses of smartphones, 32.18% of participants reported using their smartphones primarily for communication. WhatsApp emerged as the most used mobile application, with 45.63% of participants utilizing it regularly. Additionally, Kriya Sharir (~Ayurveda Physiology) was identified as the most interesting subject by 14% of the respondents. **Conclusion:** The study identified the advantageous dimensions of smartphone utilization among medical professional students with judicious use. This underscores the need for responsible use and self-regulation. Limitations include self-reported data, self-structured and adopted and without validated questionnaire, recall bias, descriptive statistics and a cross-sectional design that limits causal inference.

Keywords: Smart phone, Usages, Academic Performance, Medical Professionals students.

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INTRODUCTION

According to a 2014 study,[1] 1.85 billion people worldwide were using smartphones, a projected to increase to 2.32 billion by 2017 and 2.87 billion by 2020. According to research firm Statista, the smartphone penetration rate in India will reach close to 71% by 2023.[2] By 2024, the global number of smartphone users is expected to reach 7.1 billion, with 6.84 billion smartphones currently in use. In India, the country had the world's second-largest internet population, with over 1.2 billion users, of which 1.05 billion accessed the internet through mobile phones. Projections suggest that this number will exceed 1.2 billion by 2050.[3] The evolution of smartphones has further expanded their role from a simple communication tool to an indispensable part of everyday life.[4] In the educational sphere,[5] smartphones have significantly facilitated learning by providing instant access to a wealth of information, including images, videos, and other educational resources. This has made the learning process more interactive and accessible. Furthermore, smartphones have revolutionized entertainment, with online games, social media, and streaming services offering an abundance of leisure options, often displacing physical activities. This shift in lifestyle may adversely impact on the mental, physical, and emotional health of students.[6]

Medical students represent a unique academic population characterized by intensive coursework, demanding clinical responsibilities, and high cognitive and emotional workloads. Unlike students in many other disciplines, their academic success is critically tied to both theoretical understanding and practical competencies, which are often time-sensitive and performance-based. In this context, smartphone usage presents a double-edged sword: while it can facilitate access to medical

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resources, clinical guidelines, and collaborative tools, excessive or non-academic use may impair concentration, sleep quality, and time management-factors directly influencing academic performance.[7]

Despite the increasing integration of smartphones into medical education, there is a paucity of research that critically examines the balance between their beneficial and detrimental effects specifically among medical students. Most existing studies tend to generalize findings across broader student populations, without isolating the unique academic demands faced by future healthcare professionals. This study, therefore, aims to address this research gap by focusing explicitly on medical students, to better understand how their academic outcomes may be uniquely impacted by smartphone usage patterns.

MATERIALS AND METHODS

A cross-sectional survey study was conducted over a period of two years at the National Institute of Ayurveda, Deemed University, Jaipur, Rajasthan, India. The study included students from all academic years. Using Yamane's formula:[8]

(n=N1+N(e)2) (n=\frac{N} {1 + N(e)^2}) (n=1+N(e)2N)

And with a total population of 1500 medical students, a precision level of 5% (0.05) level was applied to obtain a sample size of 550. A total of 550 healthy participants of both sexes, aged between 18 and 50 years, were selected. The study protocol was approved by the Institutional Ethics Committee (No: IEC/ACA/2022/01-24) and registered with the Clinical Trial Registry of India (CTRI No: CTRI/2022/05/054669).

A well-structured questionnaire[9] was adopted and some questioned were developed through peers by Face and content validity for the study, covering demographic details such as age and gender, as well as self-reported mobile phone usage patterns and its impact on academic activities. After obtaining the Institutional Review Board and ethics committee approval, this survey was conducted online, through convenience methodology. Students were approached in their respective lecture halls, where the purpose of the survey was explained, and informed consent was obtained. The survey was then conducted online using a Google Form. A link to the questionnaire was sent to the students, and the researcher provided guidance on how to complete the form. The students were asked to submit their responses electronically after completing the questionnaire.

The data collection process was self-administered, with participants independently reading and responding to the questions, providing detailed information about their smartphone usage.

Statistical Method

Once informed consent was obtained, the demographic profiles of the participants were assessed, and their responses regarding smartphone usage were recorded via the online self-assessment Google Form. The data were then entered into a Microsoft Excel sheet for analysis. Only Descriptive statistics were applied to summarize the quantitative variables, providing an overview of the patterns of smartphone usage among the participants.

RESULTS

The collected data were analyzed using simple statistical techniques to calculate percentages, as presented in Table 1. Out of the 550 respondents, 295 (53.64%) were female, and 255 (46.36%) were male (Figure 1). Most of the respondents (291, 52.90%) were in the 21-25 years age group, with the remaining participants spread across other age groups. Notably, all 550 respondents (100%) were smartphone users. A significant portion of the respondents (147, 26.72%) were in the first year of their Bachelor of Ayurveda in Medicine and Surgery (BAMS) program. Most students (548, 99.63%) reported qualifying for their exams on their first attempt. Most students (507, 92.18%) were from middle-class backgrounds, followed by 35 (6.37%) from higher-middle class and 8 (1.45%) from high-class backgrounds (Figure 2). Regarding habitat, 288 (52.36%) of the students were from rural areas, 257 (46.72%) from urban areas, and 5 (0.90%) from semi-urban areas (Figure 3).

Table 2 presents the influence of smartphone usage on students' academic performance. Most students (164, 29.81%) used their smartphones for approximately 3 hr per day. A large proportion of the students (434, 78.90%) resided in hostels or as paying guests. Most students (206, 37.45%) reported checking their mobile phones 11-20 times per day. When asked about the primary purpose of smartphone use, 177 (32.18%) students cited communication as their primary interest. WhatsApp was identified as the most commonly used mobile application for communication by 251 (45.63%) of the respondents. Interestingly, 77 (14%) students found Kriya Sharir (~Ayurveda Physiology) to be the most interesting subject to learn through their smartphones. A substantial number of students (264, 48%) admitted to occasionally checking their mobile phones while studying their favorite subject. Regarding sleep patterns, 277 (50.36%) students reported going to bed between 11 PM and 1 AM, with 250 (45.45%) feeling refreshed after waking up. Additionally, 200 (36.36%) students expressed satisfaction with their daily routines (Figure 4).

DISCUSSION

In the current digital age, smartphones have become integral to students' academic and personal lives. Beyond their primary function of communication, they facilitate internet access, provide entertainment, and support numerous other applications. Nevertheless, the proliferation of such technologies is accompanied by a spectrum of both beneficial and adverse effects. While smartphones provide comfort and convenience,

their indiscriminate usage can also introduce challenges, especially among students.[10] This study explored the patterns and implications of smartphone use among medical professional students, with a specific focus on its impact on academic performance, behavioural outcomes, and variations based on gender and residential status.

Smartphone Usage Patterns

The findings indicate that most respondents (53.64%) were female, aligning with previous research, such as the study by Yi-Fen Chen in Taiwan,[11] which found higher smartphone engagement among female students. Most participants (52.9%) were between 21-25 years, a demographic often associated with high digital connectivity but also vulnerability to social and psychological pressures. Previous studies have indicated that a significant portion of internet users (nearly half) belong to this age group, and this demographic, while benefiting from the connectivity technology provides, may also face challenges in maintaining familial and social connections.[12] Notably, 26.72% of first-year students reported heavy smartphone use, suggesting that early academic transition phases may heighten dependency on digital tools for social integration and self-expression.[13]

Students primarily used smartphones for communication and social networking, a trend confirmed by a similar study at Baylor University, Texas. Frequent usage patterns-such as checking phones 11-20 times daily-highlight the embedded nature of smartphones in student routines. Social media platforms like WhatsApp emerged as the dominant application, echoing findings by Yadav JU *et al.*, emphasizing the centrality of these platforms in student interactions.[14]

Impact on Academic Performance

Although an overwhelming majority (99.63%) of students reported clearing their exams on the first attempt, qualitative feedback revealed that smartphones often distracted from academic responsibilities. Social media engagement and messaging were commonly cited as reasons for reduced study time and missed academic deadlines. This aligns with previous literature suggesting that digital distractions reduce attention span and learning efficiency.[15]

Late-night smartphone use emerged as a particular concern, associated with daytime drowsiness and reduced classroom concentration. Students reported prioritizing entertainment and social interactions over educational content like e-books or lecture recordings. This supports the growing body of research linking poor sleep hygiene with reduced academic performance and impaired cognitive functioning in students.[16]

Behavioural Consequences

Behaviourally, the study revealed that smartphones are often used as tools for identity expression, especially among students from rural backgrounds (52.36%). This demographic viewed mobile devices as status symbols, customizing them with wallpapers, ringtones, and accessories-a finding that reflects broader socio-cultural trends in digital consumerism.[17] Although lifestyle elements like tea consumption or bowel habits showed no direct link to smartphone use, a significant portion (29.81%) reported spending three or more hours daily on their devices-an amount previously associated with the onset of problematic digital behaviours.[18] The integration of multitasking, digital shorthand, and constant connectivity has also altered communication styles among youth. These behavioural shifts may erode traditional interpersonal skills and foster increased dependency on virtual socialization, as supported by studies on media multitasking and self-disclosure.[19]

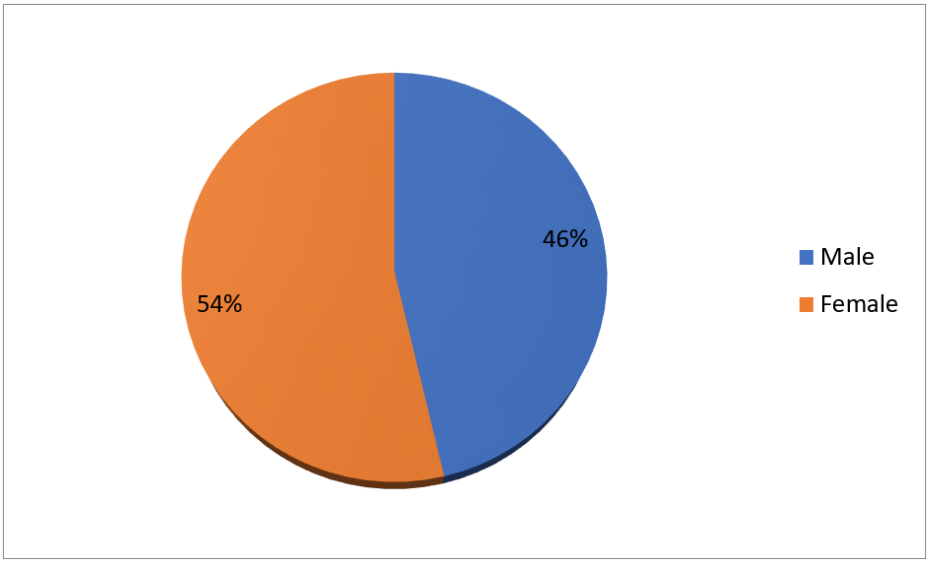

Figure 1: Gender Wise Distribution.

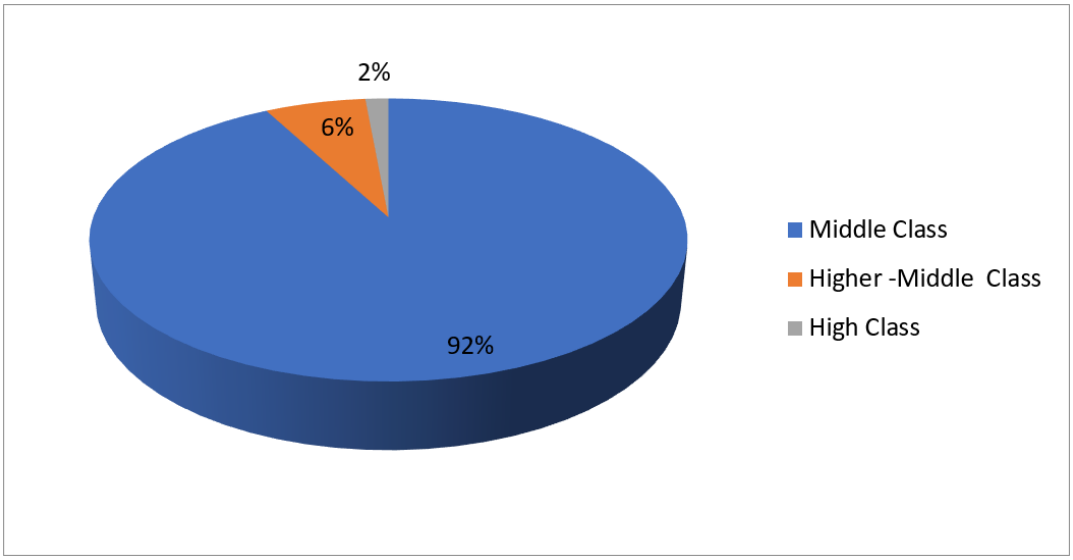

Figure 2: Economic Wise Distributions.

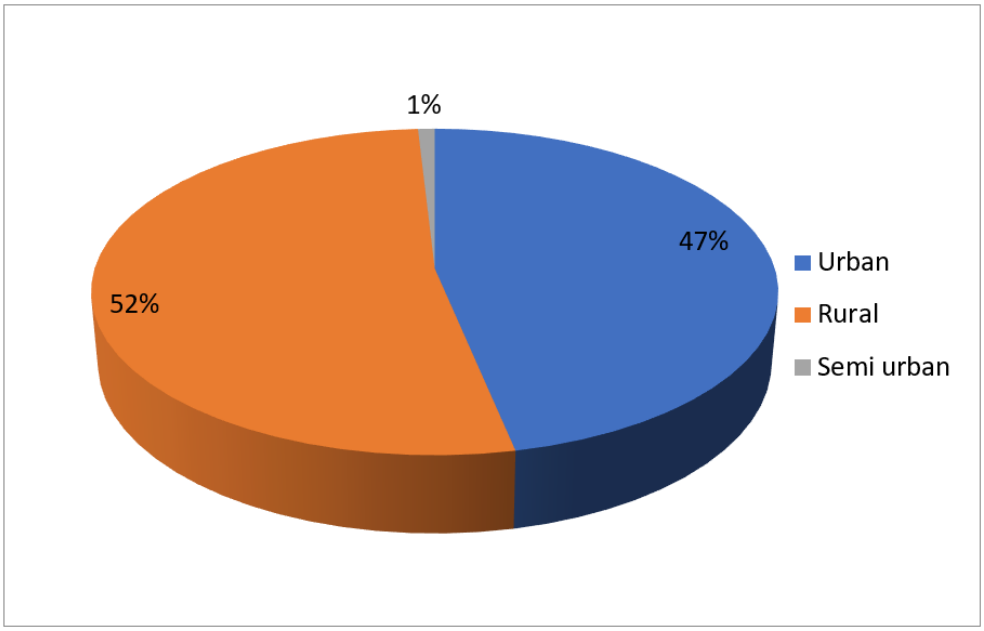

Figure 3: Habitat Wise Distributions.

Gender/Hostel-Based Trends

Residential status and gender influenced usage patterns. Hostel residents and paying guests (78.90%) demonstrated higher smartphone use compared to day scholars, likely due to increased unsupervised time and greater need for social connection.[20] Consistent with international findings, females were more frequent users of communication-based applications, which may be due to differing social motivations between genders.

While excessive usage posed risks, a silver lining emerged: 14% of students reported using their smartphones to study Kriya Sharir (~Ayurveda Physiology). Visual tools such as video lectures and 3D models enhanced their understanding of complex subjects, reinforcing the potential of smartphones as effective educational aids when used judiciously.[21,22] Prior studies support the value of multimedia in improving academic outcomes through enhanced concept visualization.[23]

Sleep and Well-being

Sleep quality emerged as a mixed finding-while 45.45% of students felt refreshed upon waking, 50.36% reported sleeping post-11 PM, and 36.36% expressed dissatisfaction with their daily routine. Sleep deprivation, linked with late-night browsing, correlates with reduced concentration, increased stress, and suboptimal academic outcomes, as widely documented in studies on digital sleep disruption.[24]

Overall, while smartphones offer opportunities for learning and connectivity, their excessive or unregulated use-especially during late hours-can negatively influence academic performance,

Table 1: **Demographic Information.**

Sl. No.	Characteristics	Total (*n*=550)	Percentage
1	Gender		
	Female	295	53.64%
	Male	255	46.36%
2	Age group (Maximum Subjects)		
	21-25 Years	291	52.90%
3	Study in Current Professional Years (Maximum Subjects)		
	BAMS 1st Year	147	26.72%
4	Number of attempts to qualify the exam		
	One	548	99.63%
	More than one	02	0.36%
5	Economic Status		
	Middle Class	507	92.19%
	Higher -Middle Class	35	6.37
	High Class	08	1.45
6	Habitat wise distribution		
	Urban	257	46.72%
	Rural	288	52.36%
	Semi urban	05	0.90%

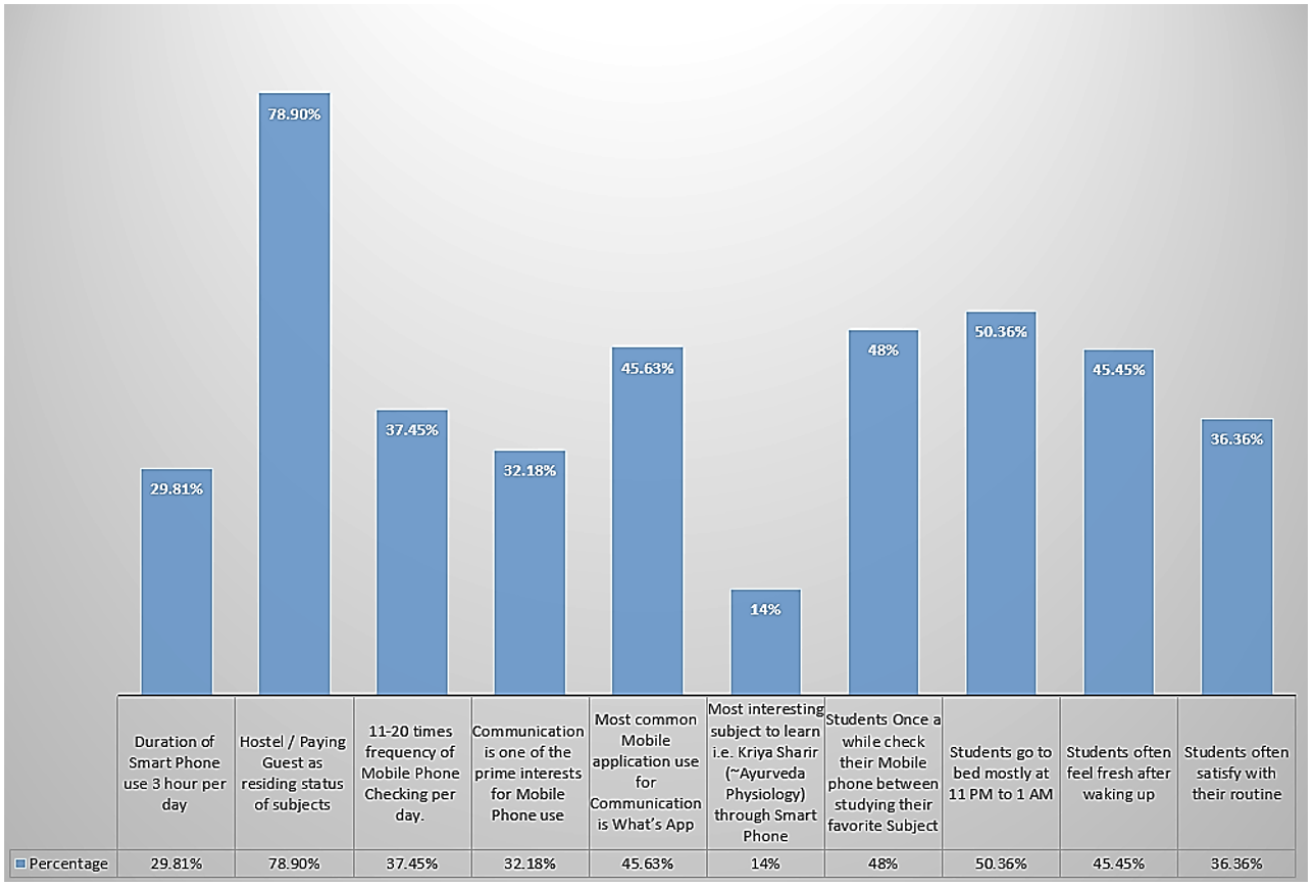

Figure 4: Characteristics how mobile phone influencing Student's academically.

Table 2: Information regarding how mobile phone influencing Student's academically.

Sl. No.	Characteristics	Total (*n*=550)	Percentage
1	Duration of Smart Phone use 3 hr per day	164	29.81%
2	Hostel / Paying Guest as residing status of subjects	434	78.90%
3	11-20 times frequency of Mobile Phone Checking per day.	206	37.45%
4	Communication is one of the prime interests for Mobile Phone use	177	32.18%
5	Most common Mobile application use for Communication is What's App	251	45.63%
6	Most interesting subject to learn i.e., Kriya Sharir (~Ayurveda Physiology) through Smart Phone	77	14%
7	Students Once a while checks their Mobile phone between studying their favorite Subject	264	48%
8	Students go to bed mostly at 11 PM to 1 AM	277	50.36%
9	Students often feel fresh after waking up	250	45.45%
10	Students often satisfy with their routine	200	36.36%

cognitive function, and behavioural well-being. This study contributes to the understanding of smartphone-related academic and psychosocial dynamics among medical students, emphasizing the need for digital literacy programs that promote mindful usage and self-regulation.

Potential Shortcomings and Limitations

This study has several limitations that should be acknowledged. Conducted within a single institutional setting, the findings may not be generalizable to broader student populations. Data collection via Google Forms may have introduced self-selection bias and excluded participants with limited internet access or digital literacy, while the lack of researcher supervision could have affected the accuracy of responses. A major limitation is the use of a non-standardized and non-validated questionnaire, which raises concerns about the reliability and validity of the data collected. Additionally, the convenience sampling method may have introduced response bias and limited the representativeness of the sample. The exclusive use of descriptive statistics restricted the analytical depth, and the cross-sectional nature of the study prevents conclusions about causality.

Future scope of the study

It should use validated questionnaires and apply inferential statistics such as chi-square, correlation, or regression to explore deeper relationships between smartphone use and academic performance. Longitudinal and multi-institutional research would improve generalizability and allow for causal inferences. Qualitative methods may also add valuable contextual insights.

CONCLUSION

The study identified the advantageous dimensions of smartphone utilization among medical professional students with judicious use. Educational institutions should focus on promoting digital well-being through targeted awareness programs, emphasizing the importance of healthy usage habits. While academic performance may not be directly affected, excessive smartphone use could still impact other areas of student life, such as sleep quality, concentration, and stress levels. Incorporating digital literacy and self-regulation strategies into student support services and wellness initiatives may help mitigate these broader risks. Continuous monitoring and early intervention for problematic use can further support students in maintaining a balanced relationship with mobile technology.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

ETHICAL APPROVAL

The study was approved by the Institutional Ethics Committee.

AUTHOR'S CONTRIBUTION

Dr. Hardik Chudasama; Dr. Resmi B.G and Dr. Sarika Yadav contributed to conceptualization, data collecting, drafting the original manuscript and its review and editing Prof. Chhaju Ram Yadav reviewed the manuscript and critically assessed its intellectual content. All authors were involved in revising the manuscript and preparing the final version. They have read and approved the finalized manuscript, ensuring the accuracy and integrity of all of the work.

SUMMARY

Smartphones have become essential in modern life, particularly among youth, though excessive use may negatively affect health and academics. This two-year cross-sectional study investigated the impact of smartphone usage on academic performance among 550 randomly selected medical students (aged 18-50) from National Institute of Ayurveda, Deemed University, Jaipur, Rajasthan. Data was collected using a structured, self-reported questionnaire and analyzed via excel. Female students made up 53.64% of the sample. Communication was the most common smartphone use (32.18%), with WhatsApp being the most frequently used app (45.63%). Additionally, 14% of students found Kriya Sharir (~Ayurveda Physiology) to be their most interesting subject. The study concluded that smartphones offer academic benefits when used judiciously but emphasized the importance of responsible usage. Key limitations included reliance on self-reported data, non-validated questionnaires, recall bias, and the descriptive, cross-sectional nature of the study that prevents causal conclusions.

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