

To evaluate the prevalence of digital burnout among medical science students and correlate the levels of digital burnout with other demographic variables

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ABSTRACT

Background: Frequent use and exposure to digital devices in both academic and personal settings predisposes university students to digital burnout. **Objective:** To evaluate the incidence of digital burnout among medical science students and to associate the levels of digital burnout with diverse demographic characteristics. **Methods:** A descriptive cross-sectional study was done using convenient sampling among 300 students (86.3% male, 13.7% female) across various programmes and academic levels. The instruments employed for data collection were Tool 1 - Demographic Data and Tool 2 - Digital Burnout Scale (DBS). **Findings:** The findings indicated that 75% of the students experienced moderate to mild burnout. In general, and across all subcategories, average ratings reflect moderate levels of burnout. A notable disparity in digital burnout was identified among age groups ($F=4.62$, $p=0.011$), with individuals aged 24 and above exhibiting the highest levels of burnout relative to their younger peers. A statistically significant difference was observed in digital burnout scores among groups categorised by online duration, specifically beyond 6 hours ($F = 4.52$; $p = 0.007$). The study reveals that students experience moderate burnout, correlated with age and duration of gadget usage. **Conclusion:** Specific strategies are necessary to mitigate digital burnout, particularly among seniors and individuals who engage extensively with online platforms. Institutions must thoroughly investigate the implementation of programs to foster better digital habits and offer resources that enhance students' well-being in progressive digital academic settings.

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INTRODUCTION

The swift progression of technology has prompted numerous individuals to adopt a digital lifestyle, significantly influencing their professional and psychological development. Technology impacts multiple aspects of human existence, including social connections, cognitive processes, behaviour, emotions, and mental health. Although digital communication, technology, and the internet offer various benefits, they also include disadvantages, such as loneliness, melancholy, diminished self-esteem, jealousy, addictive behaviours, and difficulties in relationships. The emergence of COVID-19 and subsequent global lockdowns resulted in a substantial rise in the duration individuals engage online for both professional and recreational activities. Statistics indicate an increase in digital activities since the onset of the lockdown: streaming web series and shows rose by 57%; social media usage by 47%; messaging services by 39%; music streaming by 36%; mobile applications by 35%; video gaming by 15%; video creation and sharing by 14%; and podcast consumption by 14%. According to global device usage data, smartphone utilisation reached 76%, laptops at 45%, desktops at 32%, tablets at 22%, smart TVs or streaming devices at 34%, gaming consoles at 17%, smart speakers at 11%, and smartwatches at 6.3%. Since the pandemic started, digital technology has become an important part of modern life. The use of digital technology is "a broad term encompassing various devices, services, and applications." The proliferation of digital technology has resulted in multiple manifestations of social media addiction, virtual communication, online shopping, gaming addiction, and excessive downloading of films, images, or applications. Individuals addicted to digital usage exhibit poor time management abilities regarding Internet use. Moreover, this has adversely impacted their quality of life and self-esteem. Another significant problem is the inappropriate and excessive use of unintegrated digital teaching and learning devices in the classroom. Their excessive usage has led to digital fatigue among pupils [3].

The phrase "burnout" denotes a condition of mental, bodily, or emotional fatigue. In their 2001 study, Maslach et al. characterised burnout as a condition of exhaustion marked by extended physical and emotional weariness, reduced job performance, decreased productivity, disengagement, and adverse attitudes towards work [4]. Symptoms of digital burnout

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encompass diminished productivity, challenges in routine management, chronic exhaustion, and emotional volatility. Burnout adversely influences quality of life by profoundly affecting mental, physical, and emotional health. Digital burnout specifically emerges through symptoms like decreased motivation, impaired performance, mental fatigue, and a range of physical health complications. Adverse impacts include limited linguistic development, less involvement, and unfavourable emotional responses. Digital burnout presents multiple symptoms, such as insomnia, reduced work efficiency, familial discord, fatigue, stress, apathy, emotional detachment, challenges in emotional regulation, and both physical and mental health issues [5]. Burnout can manifest in numerous forms throughout an individual's life, as it encompasses both psychological and physical dimensions. Academic burnout derives from the notion of employment burnout and is typically characterised by three primary components: emotional tiredness, cynicism, and a reduced feeling of academic efficacy.

Erten and Özdemir enhanced the concept of digital burnout by delineating three characteristics: digital ageing, digital deprivation, and emotional weariness. Excessive engagement with digital platforms leads to a failure to equilibrate the physical and virtual realms, which is termed "digital ageing." Digital deprivation refers to the adverse physical or psychological consequences resulting from the avoidance of digital platforms. Emotional weariness refers to the depletion of emotional resources. Excessive online engagement increases the likelihood of digital addiction and results in digital fatigue. In conclusion, university students are more susceptible to digital burnout when they often engage with digital devices in both academic and personal settings. The advantages of assessing digital burnout among nursing students include enabling students to understand their situation and discover coping mechanisms, allowing educators to revise curricula and incorporate innovative teaching methods, and facilitating improved counselling and support services inside educational institutions. It can assist students in implementing necessary modifications for a more fulfilling and healthy existence. This study is expected to stimulate further research on the potential effects of digital burnout on learning and academic performance.

RESEARCH ELABORATIONS

A total of 300 university students participated in this investigation. 83.0% were nursing students, the predominant group, followed by MLT students at 8.3% and pharmacy students at 8.7%. The sample was selected using a convenient non-random selection method. Instrument for Data Collection 1. This research gathered data through two instruments: a questionnaire for descriptive attributes and the Digital Burnout Scale (DBS). The questionnaire uses "Google Forms" and comprises two sections. Part one comprises demographic data, featuring 11 descriptive variables pertaining to students enrolled at Mohammed Al-Mana College for Medical Sciences. This encompasses age, gender, educational major and level, marital status, used digital devices, average daily Internet usage (in hours), and impact on academic achievement, among other factors. Section two comprises the Digital Burnout Scale (DBS). The original 24-item Digital Burnout Scale (DBS) was adapted for application in this study. The adjusted scale exhibits robust validity concerning item content and structure, as indicated by a Cronbach's alpha coefficient of 0.946. The 21 questions are divided into three subscales: emotional tiredness, digital ageing, and digital deprivation. Participants evaluate each item using a three-point Likert scale, where "3" signifies "Always", "2" signifies "Sometimes", and "1" signifies "Never". The digital ageing subscale assesses an individual's challenges in reconciling the real and virtual realms due to excessive engagement with digital platforms. It consists of 11 items, with total scores varying from 11 to 33. Elevated scores indicate increased levels of digital ageing. The digital deprivation subscale assesses the degree to which an individual experiences physical or psychological distress when removed from digital platforms. This subscale has six items, with total values varying from 6 to 18. Elevated scores signify an increased degree of digital deprivation.

The "emotional exhaustion" subscale assesses the degree of emotional fatigue encountered by an individual. The total score, consisting of four components, goes from 5 to 12, with elevated scores signifying increased emotional weariness. The burnout evaluation test classified scores into the following categories: Severe Burnout (63–52), Moderate Burnout (51–42), Slight Burnout (41–32), and No Burnout for scores of 31 or lower. The data-gathering instrument is based on a standard tool, with the English version utilised, as English is the medium of instruction at the college. The researcher finalised the scale based on expert opinions and recommendations.

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Ethical considerations: The Institutional Review Board granted approval for the study (Approval No: SR/RP/157). All students were thoroughly apprised of the study's objectives and methodologies, and those who agreed to participate provided their informed consent. The data were collected via an online survey administered through Google Forms. Prior to participating in the study, participants were obligated to read and consent to an informed consent form located on the initial page of the survey. Only participants who granted their consent were incorporated into the study sample. The survey was structured to limit the acquisition of personal information in order to safeguard participant privacy. The data analysis was conducted with a significance level of 0.05. Descriptive statistics, including mean, percentage, frequency values, and minimum and maximum scores, were utilised to summarise the data. The Shapiro-Wilk test was employed to assess the total burnout scores for normality, as the p-value (.140) exceeded the 0.05 threshold. An ANOVA test was employed to compare the demographic data and prevalence of digital burnout.

RESULTS AND DISCUSSION

In this study, 300 university students participated, with nursing students representing 83.0% of the total population, followed by MLT students at 8.3% and pharmacy students at 8.7%, as indicated in Table 1. The student representation across the three university years was as follows: first year (38.7%), second year (26.3%), and third year (35.0%). The majority of the sample is female (86.3%), and a significant proportion is single (77.7%). 52.0% were aged 21 to 23, while 28.0% were aged 17 to 20. A majority of students (52.3%) allocated 6 hours or more every day to digital media, whereas 40.7% dedicated 4 to 6 hours, and a small number (7.0%) engaged for 1 to 3 hours. A majority of consumers (97.0%) preferred smartphones, while 58.3% preferred tablets. Approximately 48.3% reported that the use of digital gadgets negatively impacts their academic performance, whilst 51.7% indicated no effect. Recognising the adverse effects of excessive usage, the majority (67.3%) sought to reduce their screen time. Furthermore, seventy-five percent of respondents believed that institutions ought to instruct students on mitigating and managing digital tiredness.

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Table 1 presents the university students who participated in this study

		Frequency	%
Age	17 -20 years	85	28.0 %
	21-23 years	156	52.0 %
	24 and above	60	20.0 %
gender	Female	259	86.3 %
	Male	40	13.7%
marital statu	Single	233	77.7 %
	Married	67	22.3%
Academic level	First-year	116	38.7 %
	Second ye	79	26.3 %
	Third yeaar	105	35.0 %
Academic program	Nursing	249	83.0 %
	MLT	25	8.3%
	Pharmacy	26	8.7%
Average time spent	1 - 3 Hrs	21	7.0%
	4 - 6 Hrs	122	40.7 %
	More than 6 hrs	157	52.3 %
Digital Devices used	Smartphone	291	97.0 %
	No	9	3.0%
	Tablet	175	58.3 %
	No	125	41.7 %
	Desktop	29	9.7 %
	No	171	90.3 %
	Smartwatch	69	23.0 %
	No	231	77.0 %
	Others	10	3.3%
	No	290	96.7 %

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Academic performance Affected	Yes	145	48.3 %
	No	155	51.7 %
Limit Screen tim	Yes	202	67.3 %
	No	98	32.7 %
Colleges should Provide Education	Yes	227	75.7 %
	No	73	24.3 %
Chronic Illnes	Yes	53	17.7 %
	No	247	82.3 %
Total		300	

Table 2 demonstrates that 75% of the polled students indicated moderate to mild burnout, suggesting that numerous students are beginning to experience the repercussions of digital engagement and are susceptible to more severe manifestations of digital burnout. The mean burnout score (38.5) is categorised as "slight burnout", signifying a notable occurrence of mild burnout symptoms among students. In general, and across all subcategories, average ratings reflect moderate levels of burnout. The Shapiro-Wilk tests demonstrate that the overall burnout scores adhere to a normal distribution, since their p-values (.140) exceed the 0.05 threshold. The ANOVA test will be employed to compare groups.

Table 2: Incidence of Burnout

		Frequency	%
Prevalence of Burnou	No Burnout	62	20.7 %
	Slight Burnout	129	43.0 %
	Moderate Burnout	96	32.0 %
	Severe Burnout	13	4.3 %

Table 3 demonstrates a statistically significant disparity in digital burnout across age groups ($F=4.62$, $p=0.011$). Students aged 17 to 20 have the lowest average burnout scores ($M=37.2$, $SD=6.97$). The oldest cohort (aged 24 and above) exhibited the greatest burnout levels ($M=40.7$, $SD=6.79$).

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Table 3: ANOVA Test Comparing Age Groups with Digital Burnout.

		N	Mean	SD	SE
Digital Burnou	17 -20 years	84	37.2	6.97	0.76
	21 -23 years	156	38.3	8.41	0.674
	24 and above	60	40.7	6.79	0.877
One-Way ANOVA	F	df1	df2	P	
Digital Burnout	4.62	2	156	0.011	

Table 4 indicates a statistically significant disparity in digital burnout levels among groups categorised by online duration ($F=4.52$, $p=0.007$). Prolonged online activity is associated with elevated digital burnout scores, underscoring excessive digital involvement as a significant risk factor. Students who spend over 6 hours online exhibit a markedly elevated risk, as seen by mean burnout scores ($M=39.82$, $SD=7.578$) that are significantly greater than those of students who spend less time online ($M=35.48$, $SD=7.594$).

Table 4: ANOVA test contrasts online time expenditure groups and digital burnout along with its categories

	Average Time spent Oline	N	Mean	SD	SE
Digital Burnou	1 - 3 Hrs	21	37.2	7.594	0.76
	4 -6 Hrs.	122	38.3	7.819	0.674
	More than 6 Hr	157	40.7	7.578	0.877
One-Way ANOVA	F	df1	df2	P	
Digital Burnout	5.52	2	56	0.007	

DISCUSSION

The findings of this study align with previous research on digital burnout in students pursuing medical and healthcare programmes. A significant proportion of nursing students (83%) experiencing burnout aligns with assertions that this demographic is especially susceptible due to rigorous academic demands and the pervasive use of technology integral to their education. The excessive reliance on digital devices, particularly during the COVID-19 lockdown, exacerbated burnout levels. Additionally, it confirms that over fifty per cent of the participants indicated spending six or more hours each day on digital platforms. Moreover, 48.3% of students assert that digital fatigue adversely affects their academic performance, corroborating findings that link prolonged screen exposure to academic burnout. Remarkably, 67.3% of students reported actively attempting to minimise their screen time, reflecting heightened awareness of digital fatigue and its adverse consequences. Addressing burnout and implementing coping mechanisms may substantially enhance psychological well-being, aligning with findings that underscore the significance of digital literacy in mitigating stress and preventing burnout. Three-quarters of respondents advocate for universities to offer training in management. The statistic indicating that 75% of medical science students experience moderate to mild burnout highlights the prevalence of this issue. The highlighted mental health hazards associated with digital learning environments indicate that 43% of students in this cohort displayed early indicators of burnout, which may escalate to more severe burnout without care.

This study investigated the impact of age on burnout scores, specifically assessing the incidence of digital burnout among medical science students in the Eastern Province. The analysis indicates that age is a critical determinant of burnout vulnerability, revealing considerable disparities among age groups. The oldest cohort of students (aged 24 and above) had the highest levels of burnout ($M = 40.7$, $SD = 6.79$), and the youngest cohort (aged 17–20) demonstrated the lowest average scores ($M = 37.2$, $SD = 6.97$). The statistically significant difference ($F = 4.62$, $p = 0.011$) suggests that younger students are more adept at managing the challenges of online learning and digital tools. Those who noted that younger, technologically adept students typically encounter reduced burnout compared to their older counterparts align

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with this observation. Younger students may possess fewer external responsibilities, resulting in diminished stress levels in digital learning environments. Conversely, older students (aged 24 and above) exhibited a higher incidence of burnout, likely due to increased stressors such as employment, challenging coursework, and familial obligations. This corroborates the findings that older students often juggle numerous external commitments, potentially exacerbating stress and exhaustion. Furthermore, for older students who did not mature in entirely digital settings, acclimating to contemporary digital platforms may exacerbate their feelings of overwhelm.

The research also emphasised the influence of online time on burnout levels. Students who spent over six hours online reported significantly higher burnout levels ($M = 39.82$, $SD = 7.578$) compared to those who spent less time online ($M = 35.48$, $SD = 7.594$). This outcome demonstrates the detrimental impact of prolonged computer usage on mental health and is consistent with previous findings. Excessive internet engagement can lead to burnout, emotional fatigue, and cognitive overload. who indicated that extended use of digital platforms can impair individuals' work management abilities, elevate stress levels, and induce burnout. Students engaging in online activities for four to six hours had moderate burnout scores ($M = 37.26$, $SD = 7.819$), indicating that digital burnout intensifies with prolonged online engagement. This "dose-dependent" interaction is reflected in the literature. As digital learning settings gain prominence, especially in the post-COVID-19 context, extended digital interaction adversely impacts students' mental health and well-being. The research investigated the impact of demographic factors on burnout among medical science students. The duration of online activity demonstrated a moderate positive link with burnout ($r = 0.189$, $p = 0.001$). Additionally, marital status revealed a modest but significant positive correlation with burnout ($r = 0.122$, $p = 0.034$). This indicates that married students may experience greater burnout due to the dual pressures of domestic and academic responsibilities. This underscores the need for offering tailored assistance to married students. The study revealed no significant association between burnout and variables such as gender, academic year, or field of study. This contrast demonstrated that these demographic characteristics affected burnout. The current study may not precisely reflect the interaction of these characteristics with additional variables, such as online duration or programme structure.

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CONCLUSION

Targeted strategies are crucial for effectively addressing digital burnout, particularly among older students and individuals with significant online exposure. Educational institutions must prioritise initiatives that promote healthier digital practices and establish supportive settings. Providing resources and fostering well-being can enable pupils to excel in the progressively digital academic environment.

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