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# Impact of social media on academic performance and interpersonal relation: A cross-sectional study among students at a tertiary medical center in East India

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## Abstract:

**CONTEXT:** There is limited evidence on the influence of social media among medical students.

**AIMS:** To assess the pattern of social media usage among medical students in eastern part of India and analyze self-perceived impact on academic performance and interpersonal relations.

**Methods:** This cross-sectional study was based on an online survey, taken by 650 medical students at a tertiary medical center in Kolkata. The survey was created using an online tool, *Google Forms*. It assessed social media usage patterns and students' perspective on how it affects their academic performance and interpersonal relations.

**STATISTICAL ANALYSIS USED:** Pearson's correlation coefficient was used to quantify the association between self-rated academic performance and social and physical well-being, with different variables, assuming linear relationships.  $P < 0.05$  was considered statistically significant.

**RESULTS:** The usable responder rate was 55.23%, with majority being undergraduates (57.3%) in the age group of 18–24 years. The proportion who confirmed using social media was 88.58% (95% confidence interval [CI]: 85.29%–91.87%), mainly for academic purposes (82.73%; 95% CI: 78.82%–86.64%). In general, social media usage was more prevalent among medical students compared to paramedical and nursing students ( $P = 0.009$ ), although the extent of use for an academic purpose was comparable. Nearly two-thirds (60.87%) regarded social networking having a positive (improved) impact on academic performance. However, the perceived impact on interpersonal relations was inconclusive (i.e., was positive and negative in a nearly equal measure; 45% each).

**CONCLUSIONS:** Social media usage for academic purposes is high among medical and paramedical students. Students benefit from social networking and are conscious of its positive as well as negative influence on interpersonal relations.

## Keywords:

Academic performance, Facebook, medical student, online survey, social networking

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## Introduction

Wikipedia regards a social networking service (SNS) as an online platform that “enables people to build social relations and network with other people who share similar backgrounds, activities, personal or career interests or real-life connections.”<sup>[1]</sup>

With increasing penetration of the Internet in today's world, SNS is becoming an accepted facet of social life. A 2013 survey found that 73% of US adults access SNSs.<sup>[2]</sup> India had an estimated 350 million Internet users in 2015 and is also recording a huge growth in social media use.<sup>[3]</sup> This rapid growth offers new opportunities for self-learning and

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alternatives to traditional classroom- or library-based educational activity. The flexibility of online tools allows customization of learning to fit learners' needs. Students actively participating in a blog-based discussion forum have shown higher grades than students who posted less often.<sup>[4-6]</sup> Peer review of posts and feedbacks can overcome potential concerns like sharing inaccurate information.<sup>[7]</sup>

Social media usage among medical students has also witnessed tremendous surge.<sup>[8]</sup> It is presenting medical educationists with new paradigms in teaching-learning activity. Some environments now supplement traditional face-to-face training with social media seminars, online small group work, and even one-on-one mentoring. Such activities in India are limited at the moment although recent data have indicated changing trends.<sup>[9]</sup>

As SNS is becoming increasingly popular, concerns on the flip side are beginning to be raised. Researchers are finding that SNS use can be addictive,<sup>[10]</sup> and some believe that we must identify a threshold beyond which its use is tantamount to overindulgence and can be counterproductive by stealing away time for hands-on activity. Both American and British Medical Associations have put forward recommendations for the professional use of social media tools by physicians and medical students.<sup>[11,12]</sup>

Amidst the ongoing debate, there is still only limited evidence to judge the influence of social media usage on the attitudes and performance of medical students, especially from India, hence this study. This study is unique, being web-based, and aimed to address self-perceived impact on respondents' social, mental, and physical well-being, apart from academic performance.

## Methods

### Study design

The study was designed as an online cross-sectional survey targeting students enrolled in a tertiary care teaching hospital. The project was duly approved beforehand by the Institutional Ethics Committee.

### Participants

Respondents had to be at least 18 years of age and pursuing an academic course of at least 1-year duration. Their contact information was collected either from the institute's administrative office or through direct interactions. A total of 650 students were either E-mailed ( $n = 64$ ) or texted ( $n = 290$ ) with links to the online survey. The web link was "live" (accepting responses) for 6 months (November 2017–April 2018). Respondents were instructed to respond within the time frame. Monthly reminders were provided until

a response was obtained. The survey was open but exclusively distributed to our target audience. Disclosure of sensitive personal information was not required of participants.

### Sample size

The sample size was calculated assuming the proportion of SNS users among the students as the primary research question. Taking a population size of 2000 and response distribution of 50%, it was estimated that data from 323 students would have to be collected in order to answer this question with 5% margin of error and at 95% confidence level. Assuming further a nonresponse rate of 50%, the recruitment target was kept at 646, and rounded off to 650.

### Survey tool

The online survey form was a structured peer-validated, web-based questionnaire which was prepared in English using *Google Forms*. The questionnaire consisted of an informed consent section followed by open- and close-ended questions to capture information. Face and construct validation was done by two peer reviewers – one pharmacologist with special training in medical education techniques and one community medicine (public health) specialist. The initial version was piloted on twenty students in test-retest mode. Feedback about survey acceptability and completion time frame was collected. In accordance with the Checklist for Reporting the Results of Internet E-Surveys,<sup>[13]</sup> both the usability and technical functionality of the online survey were assessed. Changes made in this pilot phase included decreasing the number of questions from 38 to 30 and rephrasing of questions related to "social media addiction."

The final questionnaire demonstrated satisfactory internal consistency (Cronbach's alpha: 0.857) and was uploaded. Students were provided links to the survey and requested to respond within 6 months. Bi-monthly reminders were provided till a response was obtained. Responders were given options to edit their responses before final submission. System checks eliminated the possibility of duplicate submissions from the same respondent.

The thirty questions in the survey form comprised four sections. An online informed consent (Q1) was taken as a provision in the questionnaire. Section 1 captured sociodemographic information (Q2–Q5) and basic academic details (Q6–Q9). Section 2 assessed the usage pattern (Q10–Q21) that included frequency and duration of SNS usage and average expenditure on SNS subscription or internet usage. Section 3 evaluated "self-perceived impact on academics," i.e., perception of positive and negative impacts on

academics and abstinence pattern (Q22–Q26). Section 4 evaluated the perceived impact on social, physical, and mental well-being of the respondents (Q27–Q30). The questionnaire is provided as Supplement Table S1.

### Analysis

For data extraction and analysis, we used a pretested form. The extraction was performed independently by two of the four authors and any differences were resolved by arbitration by another author. The data were anonymized at the time of compilation into a Microsoft Excel spreadsheet. Numerical variables were summarized by mean and standard deviation when normally distributed and median and interquartile range (IQR) when skewed. Categorical variables were expressed as counts and percentages. The 95% confidence interval (CI) values were presented where deemed relevant.

Pearson’s Chi-square test (or Fisher’s exact test) was employed for subgroup comparisons, as appropriate, and  $P < 0.05$  was considered statistically significant. Pearson’s correlation was used to quantify association between self-rated academic performance and various determinants, assuming linear relationships.

### Results

Out of the 650 students, 359 completed responses (98.3% completeness) were analyzed, yielding 55.23% usable response rate [Table 1]. Incomplete responses were excluded. Majority of the respondents confirmed using social media ( $n = 318$ ; 88.58%; 95% CI: 85.29%–91.87%), mostly for academic purposes ( $n = 297$ ; 82.73%; 95% CI: 78.82%–86.64%). Many participants believed that “social networking” meant having informal communication ( $n = 217$ ; 68.24%) and not merely sharing of information ( $n = 174$ ; 54.72%).

Social networking was accessed more frequently at home ( $n = 171$ ; 53.77%) rather than at workplace ( $n = 12$ ; 3.77%). There were no gender differences in this regard. However, a higher proportion of medical students used social media in general than paramedical or nursing students ( $P = 0.009$ ) although the extent of use for academic purpose was comparable across the categories of students [Table 2]. WhatsApp (90.6%), Facebook (83%), Google+ (16.7%), and Skype (12.6%) were the most popular platforms, with daily ( $n = 292$ , 91.82%) usage clearly more frequent than weekend-only usage ( $n = 20$ , 6.29%) [Figure 1]. Most respondents were using multiple networking services. Nearly 50.94% ( $n = 162$ ) were “online” 1–3 h/day on an average and 48.74% ( $n = 155$ ) were meeting data usage bills through “out-of-pocket” expenditure. The median spending was INR 250 (IQR INR 150–500) per month.

**Table 1: Respondent details (n=359)**

Variables	n (%)
Age (years)	
18-23	235 (65.45)
24-34	115 (32)
35-44	8 (2.22)
>44	1 (0.27)
Gender	
Male	265 (73.8)
Female	94 (26.18)
Course	
Undergraduate medical	208 (57.93)
Postgraduate medical	95 (26.46)
Paramedical	17 (4.73)
Nursing	17 (4.73)
Others <sup>b</sup>	22 (6.12)
Academic year	
Year 1	66 (18.38)
Year 2	127 (35.37)
Year 3	49 (13.27)
>year 4 <sup>a</sup>	80 (22.28)
Social media usage	
Yes	318 (88.58)
No	41 (11.42)
Time spent on social media	
<1 h/day	129 (35.93)
1-3 h/day	202 (56.27)
3-6 h/day	22 (6.13)
>6 h/day	6 (1.67)

<sup>a</sup>All courses except postgraduate (medical) and postdoctoral (medical) were >4 years in duration, <sup>b</sup>Postdoctoral courses

Nearly 56.29% ( $n = 179$ ) believed that their usage increased during holidays.

A large proportion ( $n = 266$ ; 83.65%) of students were using social media for searching news ( $n = 220$ ; 69.18%), articles ( $n = 189$ ; 59.43%), and audiovisuals ( $n = 130$ ; 40.88%), mostly for academic content, and 65.09% ( $n = 207$ ) of the responders believed that this online usage had a positive impact on their academics. In contrast, students who believed that social media usage had a negative impact ( $n = 82$ , 25.79%) cited “decrease in study time,” “more inattentive,” and “reduction in attendance” as primary reasons. “Examinations” or “internet inaccessibility” were the common causes for abstinence ( $n = 196$ ; 61.64%).

A good correlation was found between academic performance and social media usage for academic purposes ( $r = 0.833$ ,  $P < 0.05$ ). The relationship between academic performance and other potential predictors of this variable was, however, weak or practically nonexistent, indicating that their impact was negligible in our circumstances.

Table 3 provides the details of perceived impact of social media usage on academic performance,

**Table 2: Use of social media - Variation by gender and course**

Variables	Using social media	P <sup>a</sup>	Using social media for academics	P <sup>a</sup>
Gender				
Male	238/265 (89.81)	0.257	221/265 (83.40)	0.634
Female	80/94 (85.11)		76/94 (80.85)	
Course				
Undergraduate medical	189/208 (90.87)	0.009*	165/208 (79.33)	0.585
Postgraduate medical	87/95 (91.58)		67/95 (70.53)	
Paramedical	14/17 (82.35)		12/17 (70.59)	
Nursing	12/17 (70.59)		11/17 (64.71)	
Others <sup>b</sup>	16/22 (72.73)		16/22 (72.73)	

\*P<0.05, statistically significant. <sup>a</sup>χ<sup>2</sup> for trend, <sup>b</sup>Postdoctoral courses

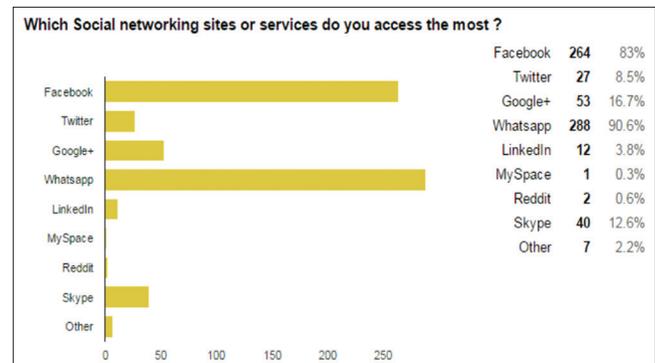
**Table 3: Perceived impact on academic performance and physical and social well-being**

Parameter	Category	n (%)	P <sup>b</sup>
Academic performance (n=318) <sup>a</sup>	Affected	207 (65.09)	<0.001**
	Not affected	66 (20.75)	
	Uncertain	45 (14.15)	
Physical well-being (n=318) <sup>a</sup>	Affected	135 (42.45)	0.806
	Not affected	145 (45.60)	
	Uncertain	38 (11.95)	
Social well-being (n=318) <sup>a</sup>	Affected	132 (41.51)	0.522
	Not affected	154 (48.43)	
	Uncertain	32 (10.06)	

<sup>a</sup>318/359 respondents confirmed using social media in the survey, <sup>b</sup>χ<sup>2</sup> for trend. \*\*P<0.001, statistically significant

physical well-being, and social well-being. Among 207 participants, 60.87% (n = 126) felt that their academic performance was influenced in a positive way, while the rest (39.13%) believed to the contrary. Commonly perceived negative effects of SNS included “hacking or leakage of personal information” (68.87%), “intrusion in personal life space” (54.72%), “physical ill effects” (25.47%), and even “reinforcement of substance abuse” (24.8%). While majority (n = 154; 48.43%) believed that social media usage had no influence on interpersonal relations, 41.51% (n = 132) harbored the contrary opinion and 27.99% (n = 89) felt that relations were better maintained through social networking. Around 44% (n = 140) of our students perceived that they were “addicted” to social media, while 43.40% (n = 138) were not addicted and 12.58% (n = 40) were uncertain.

Results of the logistic regression analysis indicate that only “social media usage” (β = -17.24, P < 0.05) was an important attribute in influencing the academic performance of students. “Time spent online” and “addiction” to social media were found to be significant predictors (P < 0.05) in affecting interpersonal relations and hence were included in the regression model for exploring the impact on interpersonal relationship. Results suggest that both factors were not significantly influencing interpersonal relationship.



**Figure 1:** Use of social media – variation by networking service. (Use of multiple social media services was noted among respondents)

## Discussion

To the best of our knowledge, this study represents the first report on the use of social networking by medical and allied students in eastern region of India. The study included not only undergraduate medical students, but also postgraduates, paramedical and nursing students, making it broad based. We found that most (88.58%) students were using social media for academic purposes, and believed that social media usage has a positive (improved) impact on their academic performance.

Our data indicate that though perceived as important determinants in general, attributes such as addiction to social media, abstinence during examinations, and time spent online do not affect student performance uniquely, but are subsumed within the broader umbrella of social media usage. Awareness about the ill effects of social media also exists. The findings have exciting implications for educators who now have to think about integrating social media and channeling its positive influence into the medical curriculum.

The use of social media in our study was high but not 100% among the surveyed students. However, the use for academic purpose was high. Irrespective of whether or not an actual user, nearly 90% of our respondents believed that social media could positively impact

academic performance. This is an encouraging finding as SNS usage for academic interaction at this stage means that these individuals will become physicians who are already knowledgeable about harnessing social media to exchange information about clinical experience and professional problems. Responsible use of social media by medical students will contribute to both their education and professionalism.<sup>[14]</sup> In the long run, this would be beneficial to patients.

In a recent, cross-sectional, online survey in Babylon, Iraq,<sup>[15]</sup> the use of social media among 2<sup>nd</sup>-year medical students was 100% and the proportion who thought that social media had a positive effect on academic performance was 42%; while 33% believed that it had negative effect, the rest (25%) thought that social media had no effect at all on their university grades. Thus, our respondents had a more prevalent view of positive impact than their counterparts in Iraq. Another recent survey from Turkey indicated that 93.4% of medical students used social media and 89.3% used social media for professional purposes.<sup>[16]</sup> Similarly, there are other similar studies from Asia Pacific University scholars of Malaysia<sup>[17]</sup> and California State University<sup>[18]</sup> who have indicated “positive” states to be more prevalent than “negative” or “neutral” states.

Interestingly, a survey from the USA by Paul *et al.* has shown that the time spent on SNS by medical students can negatively influence students’ academic achievement.<sup>[19]</sup> However, a study by Pasek and Hargittai<sup>[20]</sup> could not find a negative correlation between social media usage and academic performance in a sample of students from the University of Illinois at Chicago. The data from our study also suggests that social media usage has a positive impact on academic performance of medical students.

Adithya *et al.*<sup>[21]</sup> explored the usage of SNSs among students in India. The authors claimed that students frequently used SNSs for information gathering and getting in touch with friends. They found that 67 (54.92%) students suggested that the usage of SNSs is beneficial to their studies and learning needs whereas 22 (18.03%) students stated that SNS usage has a positive impact on their academic performance. Jahan and Ahmed<sup>[22]</sup> reported the results of perceptions of academic use of SNSs by students of the University of Dhaka, Bangladesh. A survey questionnaire was designed and distributed to gather data for this study. The study results also indicated a positive attitude toward academic use of SNSs by the students.

A recent survey in Nepal reported that widespread use of Facebook among the health science students was found to have both positive and negative effects on their social life and health. Burning eyes (21%), disturbed sleep (19%), and headache (16%) were the

most commonly encountered adverse health effects by Facebook users.<sup>[23]</sup> However, in our study, although the students were keen on such aspects, a rather comparable responder distribution was noted with regard to a positive (42.45%) or negative (45.6%) influence of social media usage on physical well-being.

Interestingly, our study revealed an important trend regarding social media addiction. Among those who felt addicted to social networking in the study, around 50% believed SNS to have an actual impact on interpersonal relations, with 62.8% indicating improved relations. In contrast, among those who were not addicted, only 34.7% believed SNS to improve relation. Thus, we found no detrimental impact of social media on interpersonal relationship, indicating that students were aware of social ethical values. However, other studies on online professionalism have reported concerns over privacy violations in cases where profanities, usage of discriminatory language, and depictions of intoxications on social media have affected interpersonal relations among students. In such instances, medical students may not be aware of the negative effect that posting materials on social web space could have on their careers or medical professionalism.<sup>[24-27]</sup>

Overall, our survey data indicates that most students perceive social media to be academically and socially benefitting. However, the study had some limitations. First, self-reported data are concerning because there is no guarantee that respondents provide accurate information. Moreover, responses could become biased by participants communicating between themselves before answering and returning the questionnaire, since there was no mechanism to restrict such communication. Second, the geographical scope was limited to a single institution which restricts the generalizability of the results. Third, although E-mailing survey links provide a sampling frame, problems such as multiple accounts, duplicate responses, self-selection bias, and invalid/inactive E-mail addresses make random online sampling a problematic method. Fourth, due to the risk of unwanted content or “spam,” online invitations may be deleted by many respondents, decreasing usable responder rate. Fifth, many students prefer offline questionnaires, reducing outreach of online surveys. Sixth, responses may be influenced by unmeasured factors or remote incidents, such as a hectic working day. Finally, lengthy surveys invite incomplete responses, as questions start feeling redundant. Despite such limitations, considering the present report to be a pilot study, such judgments are the logical next step in assessing the research question in a larger study cohort.

Despite these limitations, we can conclude that social media use is now widespread among medical and allied

health-care students and is therefore a legitimate topic for exploration. Social media can engage students in active learning through user-generated content, facilitation of communication and feedback, collaboration, and access to resources without physical location restrictions. Most students take a positive view and feel that it can facilitate their academic performance. Thus, researchers evaluating the impact of social media in medical education can look at the opportunities and challenges in integrating social media in the current framework for medical teaching. The findings of this survey can help in the planning of future studies and policy development in this regard.

## Conclusions

Social media usage for academic purposes is high among medical, paramedical, and nursing students in our institution. Most students benefit from social networking on academic front and are conscious of its positive as well as negative influence on social and interpersonal relations. Hence, teaching curriculum must incorporate learner-centric modules through social media for greater impact on student well-being.

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## Conflicts of interest

There are no conflicts of interest.

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