

# Comparing the extent and pattern of use of social networking sites by medical and non medical university students: a multi-center study

This article was published in the following Dove Press journal:  
*Psychology Research and Behavior Management*

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**Objectives:** Although use of social networking sites (SNSs) for fun and leisure is escalating, educational use of SNSs by students is low. Furthermore, there is a scarcity of data about the use of SNSs by students from different faculties. This study compared patterns and extent of use of SNSs among medical and nonmedical university students.

**Methods:** A 21-statement questionnaire was administered to the students of medical colleges of two Saudi universities and nonmedical students of two Chinese universities. Demographic data, nature of SNSs, and strategies used for sharing knowledge were collected and analyzed.

**Results:** Of 2,350 respondents, 92% used SNSs for various reasons. Overall, 624 (26.6%) students used SNSs for education and found these sites to be useful ( $P=0$ ). Educational use of SNSs was significantly higher in medical than nonmedical students ( $P=0$ ). However, non-medical students found SNSs more useful for social connections than medical students, with mean rankings of 1,328 and 978, respectively. WhatsApp use was significantly greater among medical students, while WeChat was more popular with nonmedical students ( $P=0$ ).

**Conclusion:** This study reports low use of SNSs for education by university students. For sharing knowledge, WhatsApp was more popular among medical students and WeChat for nonmedical students. This research demands educational reforms that can uniformly embed the use of social media in teaching and learning pedagogies across disciplines.

**Keywords:** social networking sites, Facebook, Twitter, Flickr, WeChat, education

## Introduction

The advent of social media has generated tremendous enthusiasm and fun for opinion expression and information exchange.<sup>1</sup> A range of Internet-based social networking sites (SNSs) are available, such as FaceBook, Twitter, YouTube, MySpace, WhatsApp, WeChat, Instagram, and LinkedIn. The estimated number of Facebook active visitors was reported to be 2.32 billion monthly in 2018, while that for Twitter has been projected to reach 275 million per month by the end of 2019.<sup>2</sup> An active user is a creator of an account who regularly uses their profile for several purposes, while a passive user engages with the platform primarily as a consumer of content, such as reading posts or tweets and watching videos or blogs.<sup>3</sup> Active users of these SNSs have grown exponentially during the last 2–3 years. Each SNS has specific features and functionality. Facebook is predominantly used for social interaction and information sharing, whereas Twitter is essentially used for sharing views and breaking news.<sup>4</sup> Facebook offers a technology-enhanced

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educational climate with a uniqueness for widening learning contexts by hybridizing a range of expertise.<sup>5</sup> However, institutional restrictions, teachers' and learners' preferences, and a wealth of cultural virtues may deter a comprehensive application of Facebook for education. Unlike Facebook, Twitter integrates individual perceptions about events, and clients share information about their activities and remarks by creating followers.<sup>6</sup>

SNSs are perceived to be innovative and efficient tools for human communication that have changed the landscape of addressing the masses for public opinion, sharing information, and downloading videos, audio, and photos at any given time. The usage of SNSs is far-ranging and has been measured in terms of time spent on applications, status updates, and their level of connectivity.<sup>7</sup> Recently, a systematic review and meta-analysis by Guraya investigated the use of SNSs by medical and allied health-science students, and reported that 75% used SNSs for general purposes and only 20% used these sites for sharing academic and educational information.<sup>8</sup> The author has emphasized the need to educate tomorrow's doctors in enhancing their expertise in digital technology. Several other reports have elucidated the effectiveness of SNSs in enhancing the educational climate in higher education, such as by strengthening student-teacher interactions,<sup>9</sup> facilitating in creating and sustaining effective engagements,<sup>10</sup> learners' motivation toward their courses,<sup>11</sup> and strong peer-to-peer interactions.<sup>12</sup>

The literature has shown that an increasing number of university students use SNSs for their teaching and learning by conveniently sharing course-content material, lectures, and handouts with other students.<sup>13</sup> The use of SNSs plays a pivotal role in distance-learning courses for university students.<sup>14</sup> This underpins the significance of SN in educational scholarships. However, there is a dearth of research and poor understanding about the precise nature of SNS use for education, and there is no standard e-platform for sharing and delivering knowledge by SNSs in higher education. Furthermore, strategies used for sharing educational information by medical and nonmedical university students from various disciplines is not known. Understanding the explicit nature of educational use and primary forms of SNS use from a professional and educational standpoint and determining popular SNSs among medical and nonmedical students will potentially help educators to develop a common education-based digital framework. The current research aimed to capture similarities and dissimilarities in the extent and nature of use of SNS data from medical students of Taibah University (TU)

and Imam Abdulrahman Bin Faisal University (IAFU), Saudi Arabia and nonmedical students of the Beijing Institute of Technology — School of Management and Economics (SME-BIT) and University of International Business and Economics (UIBE), China. The data may potentially draw the attention of educators in making a standard teaching pedagogy that could embed SNS media in existing curricula across institutions.

## Methods

### Research design

This cross-sectional study was conducted from October to December 2017 on all enrolled undergraduate medical and allied sciences students of TU and IAFU and undergraduate business and management-science students of the SME-BIT and UIBE. These countries share Asian geographical commonalities, with similar educational frameworks. At the same time, there is congruence in the range of SNSs being used in both countries. After obtaining ethical approval from the research ethics committees of relevant universities, a 21-statement validated English-language questionnaire was administered to the participants.<sup>15</sup> Completion of the survey by participants was deemed to be informed consent. The first seven statements of the instrument pertained to the frequency of SNS use on a 5-point Likert scale of never (1), once a month (2), once a week (3), once a day (4), and three to five times per day (5). The remaining sections of instrument enquired about views of university students about educational effectiveness and mechanisms of use SNSs on a 5-point Likert scale. SurveyMonkey, online survey-development cloud-based software, was used for delivery of the questionnaire and data retrieval in TU and the UIBE. However, the survey was conducted through a paper-based mechanism at IAFU, the SME-BIT, and the UIBE.

### Study settings

TU utilizes a classical 5-year MBBS competence-based problem-based learning curriculum. This program promotes clinical exposure of medical students right from the first year. In addition, well-structured portfolios, student-centered education, and clinical reasoning are embedded in the curriculum. The learning environment is enriched with an e-learning platform of TaskStream software that complements face-to-face learning with more flexibility for learners. At IAFU, the medical program consists of 1 preparatory year, 5 academic years, and one

internship training program with eight clinical rotations. This interdisciplinary program consists of a thematic integrated system that includes problem-based learning by case-based and community-based strategies in a patient-centered learning philosophy. The SME-BIT and UIBE apply 4-year undergraduate programs using a blend of arts and science in all fields of business and primarily focusing on information systems, marketing, accounts and economics.

## Data analysis

Data retrieved were analyzed using SPSS 20. Results of descriptive tests are shown by frequency distribution, graphs and clustered bar charts. The validity and reliability of the research instrument was verified by principal-component analysis and Cronbach's  $\alpha$ , respectively. Preliminary analyses demonstrated that all items of the questionnaire were arranged in an ordinal scale, so non-parametric tests were used for further inferential analyses where variables (instrument items) were arranged in a categorical format. CTo explore variations between observed and expected frequencies within each variable,  $\chi^2$  was used. As a prerequisite for using other nonparametric data, the Mann-Whitney  $U$  test was used and data normality cross-checked using one-sample Kolmogorov-Smirnov tests. In the event of a variable carrying a significant  $z$ -value ( $<0.05$ ), this would reject the null hypothesis that data were normally distributed. Consequently, nonparametric tests would be considered appropriate for comparison of responses from medical and nonmedical fields. The Mann-Whitney  $U$  test compared differences in preferences and views of medical and nonmedical students.  $P < 0.05$  was considered significant.

## Results

Of 3,000 invitees, we received 2,350 complete responses (response rate 78.33%) that comprised 1,148 of 1,500 (76.53%) from medical students: 796 of 1,000 (79.6%) IAFU and 352 of 500 (70.4%) TU students. On the other hand, 1,202 of 1,500 (80.13%) nonmedical students responded: 854 of 1,000 (85.4%) UIBE and 348 of 500 (69.6%) SME-BIT students. There were 1,332 of 2,350 (56.7%) female and 1,018 of 2,350 (43.3%) male respondents: 806 (34.3%) third-year, 542 (23.1%) second-year, 451 (19.2%) fourth-year, 420 (17.8%) first-year, and 131 (5.6%) fifth-year students. The majority of respondents (1,486; 63.2%) were aged 18–24 years, 804 (34.2%) 25–34 years, and 60 (2.6%) students  $>34$  years. Overall, 92%

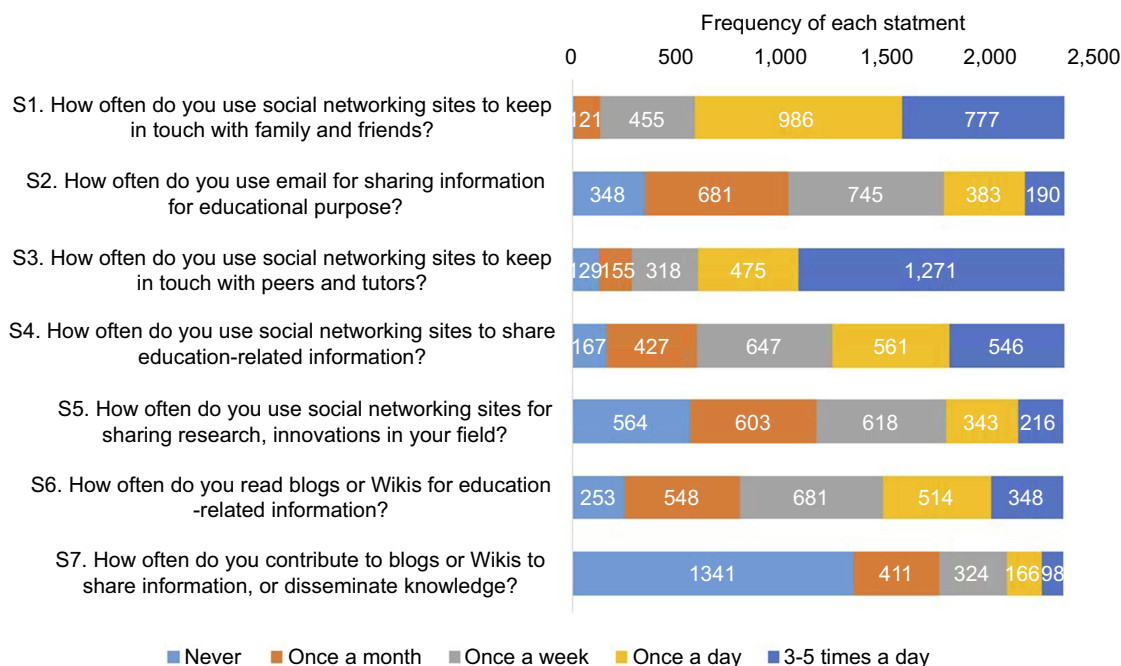
used the Internet for various reasons. Of those who used SNSs, 624 (26.6%) found these sites useful for educational purposes. A total of 362 of 1,148 (31.5%) medical and 262 of 1,202 (21.1%) nonmedical students strongly agreed that SNSs matched their educational needs.

Figure 1 presents a clustered bar chart of observed frequencies for statements about SNS degree of usage by categorical variable. For the first “How often do you use social networking sites (eg, Facebook, Youtube, Twitter, Linkedin, and Flickr) to keep in touch with family and friends?”, 986 of 2,350 (41.96%) used SNSs for keeping in contact with their friends and family once a day. For the question “How often do you use email for sharing information for educational purposes?”, 745 of 2,350 (31.70%) used email once a week for sharing educational material. From the entire cohort, a great majority of respondents utilized SNSs once a week for education (Figure 1).

Figure 2 presents a bar chart of observed frequencies for students' usage of SNSs for education using a categorical variable: 1 = strongly agree, 2 = agree, 3 = don't know, 4 = disagree, and 5 = strongly disagree. Most response was recorded for the 13th statement — “Social networking sites help me to access educational resources” — with 850 of 2,350 (36.17%) strongly agreeing that SNSs were an informative educational platform. Regarding the usefulness of SNSs in education, for the 18th statement, “I have found social networking sites useful for sharing notes and lectures”, 908 of 2,350 (38.64%) agreed that they found SNSs to be useful for sharing notes and lectures, and for “I have found social networking sites useful for educational purposes”, 920 of 2,350 (39.15%) students strongly agreed that SNSs were helpful in their learning. In contrast, 674 of 2,350 (28.68%) disagreed and 432 of 2,350 (18.38%) strongly disagreed with the 21st statement “I believe that social networking sites are inappropriate for sharing classroom materials, information, and discussing education related topics”.

Figure 3 shows the most common SNSs used by medical and nonmedical students for educational purposes. WhatsApp was the most commonly used SNS for educational purposes by medical students: 428 of 1,148 (37.28%) used it for educational purposes. In contrast, WeChat was reported to be the most common SNS for educational purposes by nonmedical students: 499 of 1,202 (41.51%) nonmedical students used it for learning.

The results of the  $\chi^2$  test of independence showed that all statements were significant at the 1% level of significance. This finding endorsed observed student's responses



**Figure 1** Observed frequencies of responses to statements about students' extent of the usage of social networking sites (n=2,350).

being statistically varied due to differences in expected frequencies within each category on the defined Likert scale (Table 1). Data were not uniformly distributed, as each statement had significant  $z$ -value of  $<0.01$ , rejecting the null hypothesis that data were normally distributed on the one-sample Kolmogorov–Smirnov test.

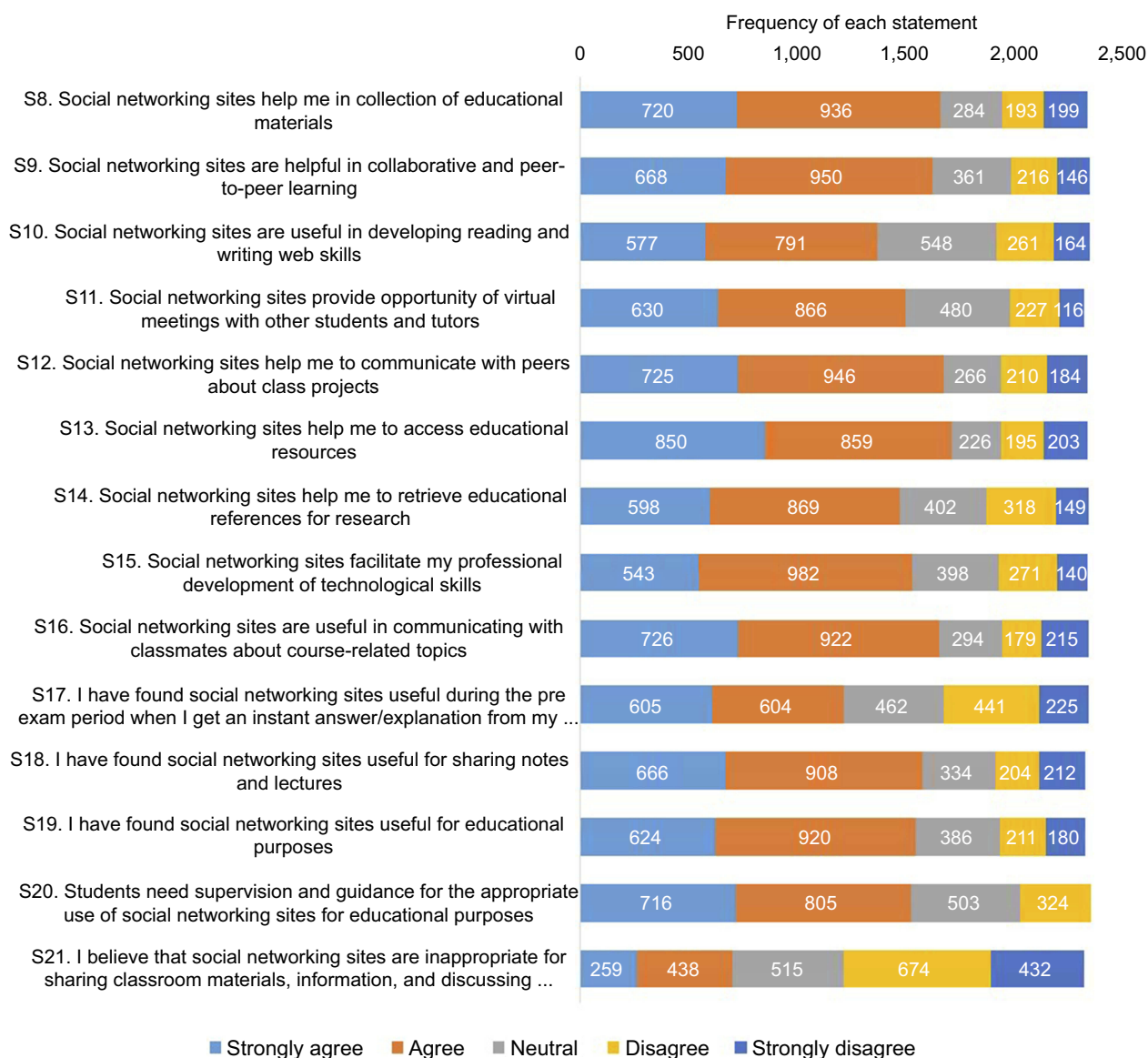
Table 2 presents the validity and reliability of the research instrument. Principal-component analysis was applied to test the validity of the questionnaire. The Kaiser–Meyer–Olkin measure of sampling adequacy was 0.94 which indicated that the degree of common variance among the 21 statements was marvelous for principal-component analysis. Likewise, Bartlett's test of sphericity was significant, which showed the validity and suitability of the collected responses was recommended for principal-component analysis. The 18 statements were extracted into 3 components on the basis of Eigenvalues. The rule of thumb is that the eigenvalue must be  $>1$ . The first component was the use of SNSs for education, with an eigenvalue of 8.66 (41.23% variance), second for the use of SNSs for professional development, with an eigenvalue of 2.25 (10.74% variance), and third for the effectiveness of SNSs for education, with an eigenvalue value of 1.29 (6.15% variance). The reliability of these factors was evaluated by Cronbach's  $\alpha$ .

The Mann–Whitney  $U$  test was used to compare responses about SNSs for different purposes and the extent of usage of SNSs using six major factors (Table 3). We

found significant variations in all factors among medical and nonmedical students that were significant at the 5% level. First, SNS usage for education was significantly higher in medical students than nonmedical students (mean rank 1,328 vs 978 for nonmedical students). Secondly, medical students used SNSs more for professional development than nonmedical students: 1,298 vs 1,055 for medical and nonmedical groups, respectively. Thirdly, medical students found social media more effective for education than nonmedical students (mean rank 1,218 vs 1,123 for nonmedical students). Lastly, medical students preferred more guidance and supervision on effective use of SNSs for their education than nonmedical students (mean rank 1,276 vs 1,068 for medical and nonmedical groups, respectively). In contrast, nonmedical students (mean rank 1,218) found SNSs to be more useful for keeping in touch with friends than medical students (mean rank 1,134). Likewise, nonmedical students perceived SNSs to be inappropriate for educational purposes than medical students (mean rank 1,229 vs 1,117 for medical students).

## Discussion

This is the first study to quantitatively compare the extent and pattern of social media use for learning by medical and nonmedical university students. Our research showed that 92% of students used SNSs for all purposes, and of those

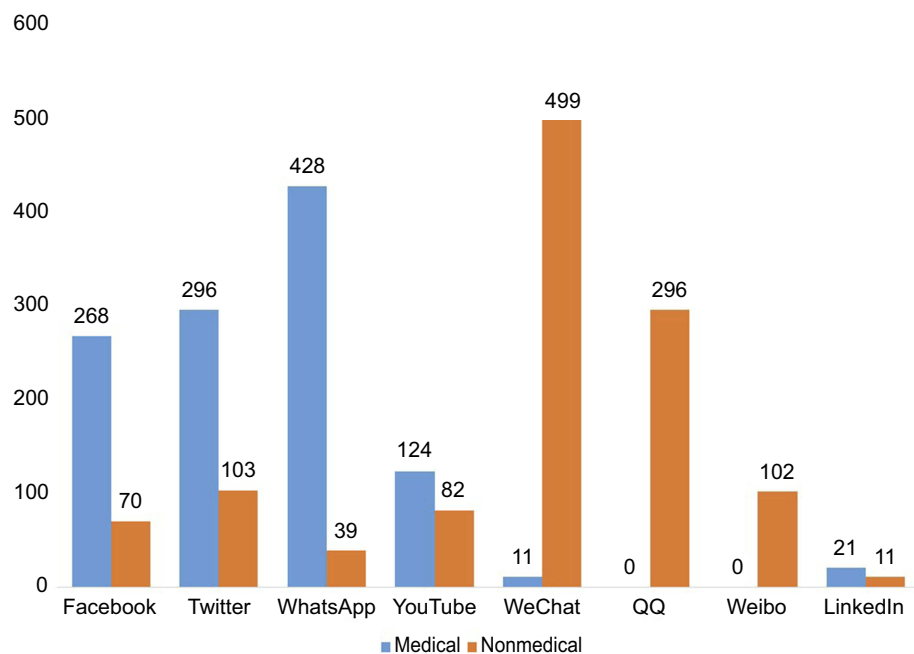


**Figure 2** Observed frequencies of responses to statements about students' perceptions of the usage of social networking sites for educational purposes (n=2,350).

who used SNSs, only 624 (26.6%) were using SNSs for educational purposes. Furthermore, the use of SNSs for education was significantly higher in medical students than nonmedical students, and medical students used SNSs for professional development much more than non-medical students. Finally, medical students found SNSs more useful for education than nonmedical students. However, nonmedical students used SNSs more frequently for keeping in touch with friends than education. In contrast, nonmedical students perceived SNSs to be inappropriate for educational purposes. There was consensus by the entire cohort that guidance, privacy, and supervision are needed for effective and professional use of SNSs for education.

Kind et al aimed to determine the presence of US medical schools on SNSs and the existence of policies that could explicitly address the use of social media.<sup>16</sup> They deduced that all 132 (100%) medical schools had websites and 95.45% (126 of 132) had a Facebook presence. Only 13 (10.16%) medical schools had guidelines that explicitly addressed policies about social media, particularly about forbidden or inappropriate material. The authors cautioned against the absence of strict guidelines for social media in higher education. The literature has raised concerns about the identity presentation and privacy concerns with Facebook.<sup>17</sup> The current study also cautions against liberal use of SNSs, particularly by university students, due to the





**Figure 3** Most common social networking sites used by students for educational purposes (n=2,350).

**Table 1** Differences in perceptions about the usage of social networking sites from the study cohort measured by  $\chi^2$  and normality tests (n=2350)

Statement	Test of independence		Kolmogorov–Smirnov normality test				
	$\chi^2$	P-value	Absolute	Positive	Negative	Z	P-value
S1	1,475 <sup>a</sup>	0*	0.24	0.18	−0.24	11.69	0*
S2	471 <sup>a</sup>	0*	0.18	0.18	−0.15	8.70	0*
S3	1,874 <sup>b</sup>	0*	0.31	0.23	−0.31	15.20	0*
S4	296 <sup>b</sup>	0*	0.17	0.15	−0.17	8.03	0*
S5	275 <sup>c</sup>	0*	0.18	0.18	−0.13	8.70	0*
S6	244 <sup>c</sup>	0*	0.15	0.15	−0.15	7.46	0*
S7	2,167 <sup>d</sup>	0*	0.34	0.34	−0.24	16.29	0*
S8	996 <sup>e</sup>	0*	0.29	0.29	−0.15	13.84	0*
S9	963 <sup>f</sup>	0*	0.27	0.27	−0.14	13.27	0*
S10	550 <sup>f</sup>	0*	0.22	0.22	−0.11	10.85	0*
S11	790 <sup>g</sup>	0*	0.24	0.24	−0.13	11.78	0*
S12	1,035 <sup>h</sup>	0*	0.29	0.29	−0.16	13.97	0*
S13	1,076 <sup>i</sup>	0*	0.28	0.28	−0.18	13.71	0*
S14	656 <sup>j</sup>	0*	0.25	0.25	−0.12	12.26	0*
S15	902 <sup>k</sup>	0*	0.27	0.27	−0.15	13.27	0*
S16	964 <sup>j</sup>	0*	0.28	0.28	−0.16	13.74	0*
S17	208 <sup>l</sup>	0*	0.20	0.20	−0.14	9.45	0*
S18	830 <sup>m</sup>	0*	0.28	0.28	−0.14	13.29	0*
S19	828 <sup>n</sup>	0*	0.27	0.27	−0.13	12.97	0*
S20	476 <sup>l</sup>	0*	0.22	0.22	−0.14	10.66	0*
S21	195 <sup>o</sup>	0*	0.20	0.14	−0.20	9.61	0*

**Notes:** Degrees of freedom for all statements 4. No cells had expected frequency <5. Minimum expected cell frequency: <sup>a</sup>469.4; <sup>b</sup>469.6; <sup>c</sup>468.8; <sup>d</sup>468.0; <sup>e</sup>466.4; <sup>f</sup>468.2; <sup>g</sup>463.8; <sup>h</sup>466.2; <sup>i</sup>466.6; <sup>j</sup>467.2; <sup>k</sup>466.8; <sup>l</sup>467.4; <sup>m</sup>464.8; <sup>n</sup>464.2; <sup>o</sup>463.6. \*Indicates the variable is significant at 5% level of significance.

**Table 2** Validity and reliability of statements

Factor	Eigenvalues	% of variance	Cronbach's $\alpha$	Number of items
SNSs for education	8.66	41.23	0.786	13 (S2–S9, S11–S14, and S16)
Professional development	2.25	10.74	0.839	2 (S10 and S15)
Effectiveness of SNSs for education	1.29	6.15	0.882	3 (S17–S19)
Kaiser–Meyer–Olkin measure of sampling adequacy 0.94				
Bartlett's test of sphericity ( $\chi^2$ ) 291.92*				

**Notes:** The remaining 3 statements (S1, S20, and S21) are stand alone and unable to apply this test on these statements. \*Indicates the variable is significant at 5% level of significance.

**Table 3** Results of Mann–Whitney *U* tests showing comparison of students' perceptions about the usage of social networking sites (SNSs) among medical vs nonmedical students (n=2,350)

Factors	Medical		Nonmedical		<i>U</i>	<i>Z</i>	<i>P</i> -value (two-tailed)
	MR	n	MR	n			
Friends and family	1,134	1,148	1,218	1,202	640,564	−3.18	0*
SNSs for education	1,328	1,148	978	1,202	566,153	−7.03	0*
Professional development	1,298	1,142	1,055	1,202	516,148	−10.60	0*
SNSs useful for education	1,218	1,136	1,123	1,296	581,288	−5.95	0*
Need supervision	1,276	1,136	1,068	1,201	560,722	−7.70	0*
Inappropriate for education	1,117	1,147	1,229	1,201	623,308	−4.16	0*

**Notes:** Total number of medical and nonmedical students 1,148 and 1,202 respectively. Sample size less fewer in number due to missing values. \*Indicates the variable is significant at 5% level of significance.

availability of uncensored and indecent material on these platforms. The amount of information shared on Facebook by clients in an open and insecure manner in the absence of privacy codes certainly exposes users to risk.<sup>18</sup> Despite the perceived risks, its interwoven relationship with students in higher education signals the importance of Facebook in facilitating learning and keeping in touch with alumni and offline communities.<sup>19</sup>

In the present study, 1,271 of 2,350 (54.08%) students used SNSs for keeping in touch with their colleagues and instructors three to five times a day. In addition, 647 of 2,350 (27.53%) used SNSs for sharing study-related material once a week, 546 of 2,350 (23.23%) three to five times a day, and 561 of 2,350 (23.87%) once a day. Several reports have shown that 94% of college students using Facebook spent an average of 10–30 minutes per day on the site and had approximately 150–200 friends.<sup>20–22</sup> However, the precise nature of SNS use for various purposes is hard to define. Course-management systems like Moodle and Blackboard, with SNSs as e-learning platforms, se have been found to be more focused and lack the customized features of individual touch and networking flexibility that SNSs offer.<sup>22</sup> SNSs are user-centered, rather than class-centered, with great promise to enhance

student engagement by encouraging rapid development of virtual communities and extending learning opportunities beyond physical classroom boundaries.<sup>10,23</sup> Correia and Davis<sup>24</sup> pointed out the effectiveness of SNSs in developing sound instructional practice for distance-education courses that facilitate the key concept of creating learners' communities.

Our study showed that medical students use SNSs effectively during the pre-exam period for instant help, while nonmedical students use SNSs effectively for sharing lecture notes. Despite knowledge about the effectiveness of SNSs for learning, only 624 (26.6%) students were making use of these platforms for their education, of which a majority were medical students: 362 of 624 (58%). This signals poor understanding of the study cohort about the outright benefits of SNSs. The utility of SNSs in education can be enhanced by focused educational reforms that foster interprofessional education and practice pitched appropriately, with the desired characteristics of professionalism and medical ethics.<sup>25–28</sup> SNSs carry more value in distance-learning courses where virtual e-learning platforms provide core curricula by telementoring and remote access.<sup>29</sup> A fundamental intervention for embedding social media in instructional pedagogies would be to modify workplace-based teaching and learning that have

been reported to be the most effective educational strategy in higher education.<sup>30</sup>

Our study found that WhatsApp was the most common SNS used for education by 428 of 1,148 (37.28%) medical students and WeChat the most common social media preferred by 499 of 1,202 (41.51%) nonmedical students for learning and sharing educational material. Although WeChat has emerged as a fascinating educational tool in medicine<sup>31</sup> and other disciplines,<sup>32</sup> surprisingly the cohort of Saudi medical students did not prefer this social media for their learning. This might be influenced by limited permission to use WeChat for the Saudi cohort and restrictions on WhatsApp by the Chinese government. These findings call for further research to determine a standard social media platform that can be tailored to meet the learning needs of university students across regions and disciplines.

Other key findings in our research signaled significantly greater use of social media by medical than non-medical students. Interestingly, most of the nonmedical students perceived SNSs to be inappropriate for educational purposes. Such significant variations in perceptions and use of SNSs could be driven by regional and educational backgrounds of the respondents, as well as different disciplines and institutional policies. These findings underpin the value of further studies that can explore the educational needs of learners that can help in better understanding of the educational use of SNSs in education.

The use of SNSs is not without problems. Cartledge et al argued that although SNSs have been seamlessly incorporated in education and has received positive feedback the, literature has not shown concrete evidence that social media is more effective than conventional educational resources.<sup>33</sup> Similarly, other studies have raised concerns about the demerits of social media in education, with particular reference to privacy and addiction.<sup>34,35</sup> This signifies the need for more evidence-based interventional studies that can highlight the effectiveness of incorporating SNSs in education. From a different perspective, understanding learners' needs by capturing viewpoints about their learning preferences will certainly help educators in modifying curricula in the right direction.<sup>36</sup>

## Study limitations

The significant variations in extent and pattern of use of SNSs by medical and nonmedical cohorts from two countries might have been influenced by cultural context. At the same time, the choice of platform and motivation for using a particular SNS application may be determined by

the availability and flexibility of its usage. These shortcomings should be considered while conducting future research in this domain.

## Conclusion

This research has convincingly evaluated the seemingly unexplored educational benefits of SNSs perceived by university students. Furthermore, the comparative data from medical and nonmedical students provide information about the popularity of various brands of SNSs in certain educational disciplines. Despite the high usage of SNSs for general purposes, educational use of these e-platforms was low. The findings of this study can be the first stepping stone toward initiating further interventional studies in determining the effectiveness of social media in education. At the same time, the diversity in using social media in our study cohort, even for learning conventions, indicates a lack of standard policy for incorporating a single digital platform into curricula across disciplines. Such findings can help educators to undertake necessary curricular reforms that can incorporate SNSs for educational purposes. However, supervised coaching and clear guidelines about the use of social media are warranted to maintain security, privacy, and professional usage.

## Author contributions

All authors contributed to data analysis, drafting or revising the article, gave final approval of the version to be published, and agree to be accountable for all aspects of the work.

## Disclosure

The authors report no conflicts of interest in this work.

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