Original Article

Pharmacy students' use of social media sites and perception toward Facebook use

Fadi M. Alkhateeb, Sarah Alameddine[1], Omar Attarabeen[2], David A. Latif[3], Shawn Osolin[3], Nile Khanfar[1], Rabaa Al-Rousan

Texas A and M Health Science Center Rangel College of Pharmacy, Kingsville, TX, [1]Nova Southeastern University College of Pharmacy, West Palm Beach, FL, [2]West Virginia University College of Pharmacy, Morgantown, [3]University of Charleston School of Pharmacy, Charleston, WV, USA

Address for correspondence:
Dr. Fadi M. Alkhateeb,
Texas A and M Health Science Center Rangel College of Pharmacy, 1010 West Avenue B, Kingsville, TX 78363, USA.
E-mail: alkhateeb@pharmacy.tamhsc.edu

ABSTRACT

Objectives: This study aimed to evaluate pharmacy students' adoption and behavior related to social networking sites (SNS) in general, and to Facebook in particular. In addition, this study aimed to explore faculty's adoption of Facebook from students' perspectives, as well as students' willingness, to "friend" their faculty. **Materials and Methods:** A 19-item questionnaire was administered to a sample of pharmacy students ($n = 195$) at a School of Pharmacy. The survey included three sections. All questions were closed-ended. The first section had general adoption questions for different SNS. The second section had questions with regard to students' behaviors and attitudes related to Facebook in particular. Demographic data was collected in the third section. **Results:** One hundred ninety-three pharmacy students completed the survey for a response rate of 99%. The top three social media websites with the most frequent usage were Facebook, Wikipedia, and YouTube respectively. Nearly, all the students (93.8%) had existing Facebook profiles. More than 70% of students had 200 or more Facebook friends at the time of data collection. Given the widespread adoption of Facebook, the majority of the respondents used it for social rather than professional or educational purposes. Even though 46.6% of participants thought that at least 40% of their faculty members use Facebook, slightly more than half of the participants (54.4%) refused the idea of "friending" their faculty. After conducting logistic regression, the predictors of "friending faculty" on Facebook among pharmacy students were the number of Facebook friends that a student has and race or ethnicity. **Conclusions:** There has been a huge growth in the number and the use of SNS. Students, if they choose to, can take advantage of this revolutionary communication tool to advance professionally. However, the majority of students still choose to use Facebook for social purposes rather than professional or educational purposes.

Key words: Facebook, social networking sites, pharmacy students

INTRODUCTION

There has been a growing number of users of social network sites (SNS) over the past few years. For instance, Facebook administration announced in September of 2014, that the total number of monthly

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active users was 1.35 billion, whereas the total number of daily active users was 864 million, of which 17.8% are from the USA and Canada.[1] Further, other SNS have reported increasingly growing numbers in their active users such as Twitter[2] and LinkedIn.[3] Even though college-age adult users form a large segment of active users, there has been a continuous growth in SNS use among older users.[4-9] This phenomenon has largely influenced many fields related to communication and social, and educational interaction. One important field that was influenced by the extensive use of SNS was health care education.[9-11]

This significant adoption of SNS use among users of the different ages is no longer surprising. Acknowledging this fact, along with different opportunities that SNS can offer, researchers have explored and evaluated its role and impact on users' personal and professional lives.[12,13] In addition, nuances pertaining to the impact of SNS use on educational attainment and academic performance have generated much discussion over the last few years.[4,8,11,14-20] Many studies investigated the use of SNS from students' perspectives,[12] whereas other studies explored faculty's perception and attitude.[15,20-22] Results from previous studies showed that the majority of students and faculty members surveyed were users of SNS, and that they spent the relatively significant amount of their time on SNS.[15,21-23]

Most SNS are designed to maximize networking and communication between different users.[24] Therefore, SNS can be of paramount importance in pharmacy education as it may promote professional and academic oriented interaction among students themselves for the sake of pursuing common interests, and between students and faculty members. This virtual connection between peers and faculty may facilitate collaboration and promote education.[25] Therefore, there could be a potential opportunity for students and faculty members to interact online. For example, faculty members may create discussion boards (e.g., blogs) to actively engage their students on the content they teach or share their course material and exams revisions online for students to read. Students might take advantage of such opportunities by interacting with faculty members in order to better their educational experience.

However, the previous literature has investigated the "faculty-student friending" from a social or psychological perspective, not from an educational perspective.[12] Further, the few studies that examined the educational aspect of the use of SNS focused only on faculty members' perspectives. Therefore, examining this topic from students' perspective was understudied.[15,20] For instance, there was no studies in the literature that address students' willingness to "friend" their faculty on Facebook. Therefore, there was a need for additional studies that investigate students' attitude toward SNS and their views of "friending" their faculty members on SNS such as Facebook. The present investigation aimed to explore students' perspectives toward SNS. The primary purpose of this investigation is to examine pharmacy students' adoption and behaviors related to SNS in general and Facebook in particular, and to explore faculty's adoption of Facebook from students' perspective, including the predictors of students' willingness to friend their faculty members.

MATERIALS AND METHODS

All participants in this study were students enrolled in the School of Pharmacy at the University of Charleston, West Virginia. A 19-item questionnaire was developed. The University of Charleston Institutional Review Board approval was obtained. All the included items were adopted from three studies by Cain and Fox, which investigated the use of social media tools among students and academicians.[13,25,26] The survey was distributed to a sample of students from all different years (P1–P4). The data were collected in January 2010. A total of 195 pharmacy students were offered to participate in the survey. The survey was anonymous. For the purpose of maximizing the response rate, the respondents' names were entered into a drawing to win three $50 gift certificates. The questionnaire consisted of three sections. All questions were closed-ended multiple choice questions. The first section investigated pharmacy students' adoption of SNS. The collected information included the frequency at which students visited Facebook along with 10 other SNS that are deemed most popular. Additionally, we evaluated the magnitude of using each of these sites by using a 5-point ordinal response format. The second section investigated students' attitudes related to the use of Facebook such as students' perceptions regarding their faculty members' use of Facebook and their willingness to "friend" their faculty members. The third section collected selected demographic information. All data analyses were conducted using SPSS 22.

Statistical analysis

Descriptive analyses were conducted to examine the frequencies and distribution of certain variables.

Fisher's exact test was conducted to test the relationship between grade point average (GPA) and the frequency of using Facebook in order to determine if there is statistical significance between these two variables. In order to investigate the predictors of students' willingness to "friend" their faculty on Facebook, Chi-square analyses followed by a binary logistic regression analysis were conducted. Certain responses were collapsed to fewer options due to having few cells in the contingency tables that contained <5 observed values. This procedure was applied to students' year (P1–P4), the number of Facebook friends, perceived number of friends for an average user, marital status, race/ethnicity, future practice sought, and age categories. The bivariate analysis was conducted to examine the association between the independent variables and the dependent variable. Independent variables that showed relative significance in the bivariate analysis (a $P \leq 0.1$) were entered in the final binary logistic model selecting the significance cut point to be 0.05. We used the backward stepwise selection model. All variables that showed the significance of >0.05 were sequentially eliminated from the model.

RESULTS

Most students (193) completed the survey, resulting in a 99% response rate. Students' adoption of SNS is shown in Table 1. Most students indicated that they used Facebook every day, making it the number one commonly used website among the 10 websites investigated. Wikipedia and YouTube ranked second and third, respectively, in terms of daily usage. However, both of these sites scored the highest for weekly usage with 42.5% and 48.2%, respectively. In contrast, very low adoption was observed for Flickr, Hi5, Bebo, Friendster, and LinkedIn. Actually, none of the students indicated that they use any of Flickr, Hi5, Bebo, and Friendster on a daily base, making them the least commonly used SNS on a daily basis.

As shown in Table 2, most students indicated that they used Facebook for social purposes rather than for professional or educational purposes. Nearly, all students (93.8%) had an existing Facebook profile. Approximately, 74.1% of all respondents indicated that they started using Facebook more than 2 years ago. Additionally, 42% indicated that they started using Facebook more than 4 years prior to the time of data collection. Even though the majority of students indicated that they used Facebook while eating or watching TV, it was notable that 16.1% and 8.8% of students indicated that they used Facebook while studying and attending classes, respectively. Other information regarding students' Adoption of Facebook and their attitudes toward its use is shown in Table 3. Additionally, students' demographic information is shown in Table 4.

Results from the bivariate analysis showed that three independent variables had significance values

Table 1: Pharmacy students adoption of SNS

	Never used it *n* (%)	Tried it once *n* (%)	Use every month *n* (%)	Use every week *n* (%)	Use every day *n* (%)	Missing data *n* (%)
Facebook	5 (2.6)	7 (3.6)	6 (3.1)	22 (11.4)	145 (75.1)	5 (2.6)
Flickr	154 (79.8)	20 (10.4)	6 (3.1)	1 (0.5)	0	12 (6.2)
Hi5	167 (86.5)	12 (6.2)	0	0	0	14 (7.3)
LinkedIn	168 (87.0)	7 (3.6)	1 (0.5)	1 (0.5)	1 (0.5)	15 (7.8)
Myspace	62 (32.1)	57 (29.5)	32 (16.6)	20 (10.4)	8 (4.1)	14 (7.3)
Twitter	116 (60.1)	35 (18.1)	16 (8.3)	8 (4.1)	3 (1.6)	15 (7.8)
YouTube	2 (1.0)	4 (2.1)	53 (27.5)	93 (48.2)	32 (16.6)	9 (4.7)
Blogs	131 (67.9)	21 (10.9)	10 (5.2)	7 (3.6)	10 (5.2)	14 (7.3)
Bebo	171 (88.6)	5 (2.6)	0	1 (0.5)	0	16 (8.3)
Friendster	162 (83.9)	9 (4.7)	1 (0.5)	1 (0.5)	0	20 (10.4)
Wikipedia	2 (1.0)	5 (2.6)	42 (21.8)	82 (42.5)	53 (27.5)	9 (4.7)

SNS=Social networking sites

Table 2: Types of facebook usage by pharmacy students

	Strongly disagree *n* (%)	Disagree *n* (%)	Neutral *n* (%)	Agree *n* (%)	Strongly agree *n* (%)	Missing data *n* (%)
Facebook for education use	52 (26.9)	69 (35.8)	49 (25.4)	12 (6.2)	3 (1.6)	8 (4.1)
Facebook for professional use	55 (28.5)	70 (36.3)	44 (22.8)	14 (7.3)	2 (1.0)	8 (4.1)
Facebook for chatting use	4 (2.1)	6 (3.1)	16 (8.3)	77 (39.9)	80 (41.5)	10 (5.2)
Facebook for keeping in touch	4 (2.1)	3 (1.6)	8 (4.1)	73 (37.8)	94 (48.7)	11 (5.7)

Table 3: Pharmacy students adoption of Facebook

Variable	*n* (%)
Have a Facebook profile	
Yes	181 (93.8)
No	12 (6.2)
Students who add faculty to their friend list	
Yes	84 (43.5)
No	105 (54.4)
Missing data	4 (2.1)
Number of Facebook friends	
<200	51 (26.4)
200-299	40 (20.7)
300-399	26 (13.5)
400-499	25 (13.0)
500 or more	45 (23.3)
Missing data	6 (3.1)
Perceived number of Facebook friends for an average user	
<200	22 (11.4)
200-299	58 (30.1)
300-399	54 (28.0)
400-499	28 (14.5)
More than 500	29 (15.0)
Missing data	2 (1.0)
How long have you used Facebook?	
<1-year	29 (15.0)
1-year	16 (8.3)
2 years	25 (13.0)
3 years	37 (19.2)
4 years or more	81 (42.0)
Missing data	5 (2.6)
How often you use Facebook?	
Multiple times a day	127 (65.8)
Once a day	35 (18.1)
A few times each week	10 (5.2)
Once a week	7 (3.6)
Once a month	5 (2.6)
Don't use it!	9 (4.7)
When do you usually use Facebook?	
While attending classes	17 (8.8)
While watching television	120 (62.2)
While eating	17 (8.8)
While studying	31 (16.1)
Missing data	8 (4.1)
How much faculty members do you think are using Facebook?	
<5%	11 (5.7)
≥5% but <10%	18 (9.3)
≥10% but <20%	27 (14.0)
≥20% but <40%	47 (24.4)
≥40% but <60%	54 (28.0)
≥60% but <80%	26 (13.5)
≥80%	10 (5.2)

of ≥0.1 [Table 5]. These variables were included in the binary logistic model. After entering these variables in the binary logistic regression model and conducting the analysis, one variable was dropped by the model as *P* value was more than 0.05, ending in two variables showing significance as predictors of students' willingness to friend their faculty. As shown in Table 6, the odds of students' willingness to "friend" their faculty is higher when students are from a non-Hispanic white race/ethnicity, and when students have more than 400 "friends" in their Facebook profile.

DISSCUSION

Pharmacy school is an intense and a demanding beginning to a student pharmacist's career. Time management is essential, yet many stimuli compete for each student's attention. Getting involved with SNS is one of the main extracurricular activities that students engage in. In this study, there are three SNSs that evidently dominated the cyberspace landscape: Facebook, Wikipedia, and YouTube. The results clearly showed that students preferred to use Wikipedia and YouTube on a weekly basis and Facebook on a daily basis. It was notable that students indicated to use Wikipedia and YouTube on a fairly regular basis although these websites are neither reliable sources of educational information, nor are they designed to maximize communication between users. In addition, Facebook was undoubtedly the students' the most frequently used SNS and the only one website to be used by more than 75% of students on a daily basis. This finding is consistent with previous research showing than more than half more students use Facebook more than once every day and that as high as 88% of students use Facebook.[8,16,27,26]

The majority of indicated that they primarily used Facebook for social purposes rather than to advance their careers. This finding was consistent with the results from previous research on pharmacy students' use of Facebook.[11] Taking into account that 42% of students reported to having had a Facebook profile for more than 4 years at the time of data collection, this indicates that students have been using it prior to their admission into pharmacy school, which explains their attitudes to using it mostly for social purposes, and not for educational and professional purposes.

Results from the students' "friending" attitude for an average user were consistent with the reported friending patterns for students. For example, 57.5% of students thought that an average user of Facebook would have at least 300 Facebook "friends." Actual friending pattern, as reported by students, showed

Table 4: Participants demographics

Variable	*n* (%)
Students' year in PharmD program	
First	74 (38.3)
Second	63 (32.6)
Third	48 (24.9)
Fourth	7 (3.6)
Missing data	3 (0.5)
GPA	
2.0-2.49	19 (9.8)
2.50-2.99	47 (24.4)
3.00-3.49	94 (48.7)
3.50-4.00	31 (16.1)
Missing data	2 (1.0)
Age	
Under 25	82 (42.5)
25-29	73 (37.8)
30-34	26 (13.5)
35 or older	8 (4.1)
Missing data	4 (2.1)
Gender	
Male	87 (45.1)
Female	105 (54.4)
Missing data	1 (0.5)
Race/ethnicity	
Non-Hispanic white	154 (79.8)
Hispanic	1 (0.5)
African American	13 (6.7)
Asian American	24 (12.4)
Missing data	1 (0.5)
Do you live with your parents?	
No	160 (82.9)
Yes	31 (16.1)
Missing data	2 (1.0)
Practice setting you are planning to pursue	
Retail community pharmacy	127 (65.8)
Hospital/clinical pharmacist	35 (18.1)
Residency	18 (9.3)
Academia	5 (2.6)
Pharmaceutical industry	8 (4.1)
Marital status	
Single or divorced	151 (78.2)
Married without kids	26 (13.5)
Married with kids	15 (7.8)
Missing data	1 (0.5)
Education level of your parents	
Graduate (MS, MA, MBA, or Doctorate)	50 (25.9)
College (BS or BA)	71 (36.8)
Some college	36 (18.7)
High school	36 (18.7)
Missing data	2 (1.1)

GPA=Grade point average

that 49.7% of students having 300 "friends" or more in their Facebook "friends" list. This consistency may confirm students perception that having at least 300 Facebook "friends" is quite expected for" average users" of Facebook.

Boogart *et al*. indicated in a thesis study published in 2006 that there was an inverse relationship between the duration of Facebook daily use and GPA.[28] However, after conducting Fisher's exact test in order to check the relationship between GPA and frequency of Facebook usage among our sample, the results showed that there was no significant correlation between these two variables (χ^2 [1, N = 191] =9.38, P = 0.138).

Another notable finding was the high percentage of respondents (23.3%) who stated to have more than 500 Facebook friends. However, according to the field of anthropology, Dunbar's number (the number of people whom a person can maintain a stable social relationship) does not exceed 230, and is commonly 150.[29,30] Therefore, some students may have a tendency to "friend" people whom they do not know or to whom they are only barely "acquainted" rather than truly "friends-with."

On the other hand, knowing the volume of students that participate in this type of communication, and their willingness to "friend" the outside world, it may prove beneficial for educators to utilize popular social media, in this case, Facebook in disseminating information and initiating group discussions. However, as freely as pharmacy students seemed to befriend someone new, less than half are willing to include their own faculty to their friend list.

As previous research has indicated, one reason for students' reluctance to "friend" their faculty could be students' beliefs that student-faculty interactions should remain professional and that different SNS, such as Facebook, are not appropriate venues for such professional communications.[25]

Results from the binary logistic regression analysis showed that students who had more than 400 Facebook "friends" were 3 times more likely to be willing to "friend" their faculty than students who had <200 "friends" in their Facebook friend list. This may indicate that students with a higher number of Facebook "friends" use this website to establish relationships, not necessarily to "friend" only those whom they previously knew. Additionally, students from minority groups (Hispanics, African Americans, and Asian Americans) were 60% less likely to be willing to friend their faculty. This may

Table 5: Independent variables with significant *P* values in the chi-square analysis with the dependent variable

Variable	Willing to "friend" their faculty *n*(%)	Unwilling to "friend" their faculty *n*(%)	Chi Square
Student year in the program			
P1	32 (44)	40 (56)	χ^2 (2, *n*=188)=6.5 *P*=0.04
P2	20 (33)	41 (67)	
P3 and P4	31 (56)	24 (44)	
Friends students have in Facebook (0.008)			
<200	16 (32)	34 (68)	χ^2 (4, *n*=186)=13.7 *P*=0.01
200-299	12 (30)	28 (70)	
300-399	12 (46)	14 (54)	
400-499	16 (64)	9 (36)	
500 or more	26 (58)	19 (42)	
Race/ethnicity (0.011)			
Non-Hispanic white	74 (49)	76 (51)	χ^2 (1, *n*=188)=6.5 *P*=0.01
Hispanic, African American, or Asian American	10 (26)	28 (74)	

n=Number of subjects included in the analysis, *P*-value <0.05 was considered statistically significant

Table 6: Significant variables in the final logistic regression equation model

Variable	*B*	SE	*P*	OR (95% CI)
Number of Facebook friends				
<200 (reference)	Reference			
200-299	−0.083	0.467	0.858	0.920 (0.368-2.298)
300-399	0.524	0.504	0.298	1.689 (0.629-4.535)
400-499	1.161	0.523	0.026*	3.192 (1.145-8.894)
500 or more	1.092	0.436	0.012*	2.981 (1.268-7.007)
Race/ethnicity				
Non-Hispanic white (reference)	Reference			
Hispanic, African American, or Asian American	−0.927	0.422	0.028*	0.396 (0.173-0.905)

*Statistical significance. *P* significant level or *P* value, *B*=Regression coefficient, SE=Standard error, OR=Odds ratio (exponential coefficient), CI=Confidence interval

indicate that students from minority groups may have barriers to building relationships with their faculty, at least from an electronic social networking point of view. Additional studies that investigate the role of faculty members' race/ethnicity in the "friending" attitude of students may be required in the future to further explore this point.

The importance of these results lies in their role in clarifying different factors that predict more student-faculty SNS interaction and electronic communication. The findings may have potential implications in practice as they help academicians and administrators create more communication channels between students and faculty. This type of interaction or E-communication is becoming more important as we have witnessed a more influential role for technology and SNS in disseminating knowledge and in promoting learning. Pharmacy education advocates and administrators may utilize this and similar studies in the future to facilitate student-faculty interaction and to design intervention that manipulate student-associated and faculty-associated factors to maximize electronic interaction for better pharmacy education.

Potential limitations of this study are as follow. Nearly, 79.8% of the respondents were of White race, which shows the need for studies of this kind among pharmacy students of more diverse races or ethnicities. Most respondents were single or married without kids, whose Facebook usage might be markedly different from students who are married with the children. Additionally, having a small sample size forced us to collapse certain responses in order to allow for more accurate analysis. Furthermore, because this investigation examined only one pharmacy school in a rural region of the USA, it might be difficult to generalize our results to other schools. Partly mitigating this limitation is the fact that more than 50% of the students were from other states and countries. Another limitation was the potential bias in participants' responses due to the three $50 gift cards incentives that were used to increase the response rate. Even though this might have influenced the validity of the results, it is expected that this did not have a great effect on the results of this study because of the very high response rate (99%). Therefore, providing incentives did not improve the response rate from one particular group, one socioeconomic class, 1-year class,

or one gender, but improved the response rate among all students across all different groups and classes.

Furthermore, as respondents' names were collected and entered into a drawing to win three $50 gift cards, their views may have been influenced. However, students were made aware that names were collected for the sake of incentives, and names were not linked to their responses in order to preserve the anonymity of the survey. Finally, the low representation of fourth year students (P4) in the study was attributed to the fact that P4 students are off-campus due to the advanced practical training, which is usually held through multiple rotations across different pharmacy practice settings away from the campus. Therefore, P4 students had a lesser chance of being recruited, and consequently, a smaller representation in the study.

Future research can focus on specific class levels (P1–P4) and show how each particular class responds to the same questions. However, a study on students of different GPA levels shall be conducted to support or counter the respondents' reported GPAs in this study. More detailed studies should be conducted as to reasons why pharmacy students are reluctant to friend their faculty and a questionnaire such as the one in this study should be given to pharmacy faculty as well. Qualitative studies (e.g., focus groups) would be an appropriate next step in exploring this topic. Finally, it would be also interesting to survey pharmacy students about their undergraduate usage of Facebook with comparisons to their current Facebook usage.

CONCLUSION

There has been a significant growth in the number and the use of SNS in the USA and across the world. The majority of users are college-age adults. Therefore, it is important to explore the opportunities such SNS can offer to the higher education. Based on the present investigation, pharmacy students are mainly active on Facebook, yet they have selective online presence and interaction. From students' perspectives, an active user is generally open to "friending" the outside world. However, the majority are still reluctant to "friend" faculty members at their school of pharmacy. In fact, most students choose to use Facebook for social purposes rather than for educational use. This demonstrates that students might not be using social networking in an optimal way to foster their education. This might represent a missed opportunity for students to take advantage of this revolutionary communication tool and to grow as professionals. By taking advantage of SNS, students might utilize their online presence in advancing their communication and interaction with their faculty members. This might improve students' skills in professional interactions and help them build their skills in electronic interaction for the purpose of advancing their professionalism and academic progress, and supporting their future careers.

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There are no conflicts of interest.

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