



## Social media usage and online professionalism among registered nurses: A cross-sectional survey



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### ABSTRACT

**Background:** Owing to its convenience and easy accessibility, social media is increasingly popular among healthcare professionals and has become a useful tool in the healthcare industry. Doctors' social media use patterns and online professionalism have been thoroughly studied. Various unprofessional behaviors such as excessive self-disclosure, violations of patient privacy and improper social media posts, were observed. However, studies exploring nurses' social media use and online professionalism are lacking. **Objectives:** The objective of this study was to understand the social media use and online professionalism of Chinese registered nurses.

**Design:** A cross-sectional survey was adopted.

**Settings:** Eight nursing conferences and one continuing-education program that took place in Sichuan, China.

**Participants:** Convenience sampling was applied to select nurses who had obtained their Chinese nursing certificates, who were aged 18 years and above, and who worked in clinical settings. The final sample consisted of 658 registered nurses.

**Methods:** Data were collected through the on-site distribution of an anonymous researcher-designed questionnaire. The questionnaire consisted of 41 items that focused on demographic and professional information, social media use and online professionalism. Medians, averages and percentages were used to describe the social media use patterns and online professionalism of Chinese registered nurses.

**Results:** All participants in this study were social media users and 84.5% of them believed that social media had positively influenced their clinical practice. WeChat was the most frequently used form of social media, which was used among 93.5% of the subjects. Common reasons for social media use included receiving messages from work, networking, receiving news and relaxing. Approximately 56% of the participants spent one to three hours on social media daily. Most of the participants had reposted medical knowledge on social media and had subscribed to at least one medical social media account. Additionally, 67.2% of the sample disclosed that they "often" communicate work-related information with colleagues via social media. Roughly 50% of the sample insisted that their facilities had social media guidelines. Registered nurses' professionalism was also assessed. Around half of the participants had received "friend request" from patients, while 63.5% of the sample acknowledged that there were no patients on their most frequently used social media platforms. About 7.6% of the respondents had "sometimes" posted identifiable patient information, which was much lower than the reported 32.5% rate of witnessing colleagues' disclosure of identifiable patient information. Fully 50.3% of the participants indicated that they had witnessed improper posts by colleagues.

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## What is already known about the topic?

- Social media is popular among healthcare professionals. It has increasingly become a crucial tool in clinical practice, medical education and healthcare research.
- Previous studies have documented healthcare professionals' social media use patterns and unprofessional behaviors.
- Studies of nurses' social media use and online professionalism are scarce. Currently, the conventional method used to unveil nurses' social media activities and online professionalism is analyzing online open data.

## What this paper adds

- Chinese nurses' social media use patterns were revealed, including their platform preference, frequency of use, and behaviors in obtaining and sharing medical knowledge.
- Patient-nurse interactions via social media were reported. Approximately half of the sample had communicated with patients via social media. Nearly 40% of the sample had patients who were on their most frequently used social media platform.
- Chinese nurses' professionalism was challenged. Our study documented nurses' self-reported patient information disclosure on social media and their witness of patient information disclosure by colleagues.

## 1. Introduction

Social media refers to the internet applications that allow the creation and communication of User Generated Content (Kaplan and Haenlein, 2010). Examples of notable social media sites are YouTube, Facebook, Twitter, Instagram and LinkedIn. According to the statistics from the Pew Research Center, 73% and 68% of American adults reported that they were YouTube or Facebook users respectively (Smith and Anderson, 2018). Social media has transformed the dissemination and reception of information as well as interpersonal communication. Social media is increasingly becoming a crucial tool in the healthcare industry. In clinical practice social media applications have been proven to be useful in health promotion (Rhodes et al., 2016) and chronic illness management (Abedin et al., 2017). In medical education social media was applied as learning and teaching supplementary tool (Guraya, 2016). Research reports that data on social media has been mined and analyzed to unveil healthcare information seeking behavior (Zhang et al., 2017), patients' disease experience (Gibson et al., 2016), comments about medical staff and hospital care quality (Hawkins et al., 2016; Mowery et al., 2016), and the online behavior of healthcare professionals (Chretien et al., 2011).

In the nursing profession, social media platforms have been widely adopted to assist in nursing education (Carrington et al., 2017; Watson et al., 2016), facilitate clinical care (De Sousa et al., 2018; Gage-Bouchard et al., 2016), and expand the methodologies and subjects of nursing research (Akard et al., 2015; Levati, 2014). As social media became prevalent among nurses, unprofessional behaviors, including the improper posting of pictures or comments and the violation of patient privacy and confidentiality, recurrently appeared in news headlines (BBC News, 2016; Farsaci, 2017), resulting in unintended consequences such as license suspension and dismissal from work. Furthermore, nursing professionals' excessive self-disclosure on social media might demeaning their trustworthiness. Despite the potential threats posed by social media, it is a crucial tool for nurses. It is therefore important to understand nurses use of social media and their online professionalism.

There are two main approaches to studying healthcare professionals' social media use and online professionalism. The first approach is to perform content analysis using openly available materials on healthcare providers' social media pages. The second approach is the distribution of questionnaires online or face-to-face. Studies that employed the above two approaches have revealed doctors' social media use patterns, including their platform preference, frequency of usage, patient-doctor interactions, and doctors' attitudes towards social media (Adilman et al., 2016; Brown et al., 2014; Cochrane et al., 2016; Garofolo et al., 2018; McDonald et al., 2015; McEvenue et al., 2016; Pearson et al., 2015). Furthermore, research has reported doctors' unprofessional behaviors on social media, like excessive self-disclosure, inappropriate posts, and patient privacy violation. (Kitsis et al., 2016; Langenfeld et al., 2014; Soares et al., 2017).

Little research has been conducted to understand nurses' use of social media and their online professionalism. A commonly used method in the current literature is analyzing publicly available data on Facebook and Twitter. Levati collected data and information on Italian and British nurses' Facebook pages and uncovered their online activities and unprofessional behaviors, such as excessive self-disclosure, alcohol consumption, and explicit posts (Levati, 2014). De Gagne et al. used data mining software to extract materials from nurses and nursing students' Twitter accounts and categorize their uncivil tweets (De Gagne et al., 2019). Qualitative narratives on anonymous nursing blogs were collected and analyzed to understand nurses' discussions about work life (Castro and Andrews, 2017). One study depicted the socio-demographic characteristics of nurses who use social media through an online survey (Kung and Oh, 2014). Nevertheless, studies that examine nurses' use of social media and their online professionalism through self-report questionnaires are lacking. This study explores the social media usage patterns and online professionalism of Chinese registered nurses through a researcher-designed questionnaire.

## 2. Methods

### 2.1. Study design, settings and participants

In this cross-sectional descriptive survey, convenience sampling was used to select Chinese registered nurses. Nurses who had obtained their Chinese nursing certificate, who were aged 18 years and above, and who were working in hospitals were invited to complete the anonymous questionnaire at eight conferences and one continuing-education program that took place in a metropolis in Southwest China.

### 2.2. Instrument

The initial questionnaire was drafted by the first author and consisted of 43 questions based on previous literature that investigated healthcare professionals' social media use, professionalism and attitudes towards social media. Two rounds of revisions were carried out, and face validity was evaluated by eight registered nurses, including the other authors, one Ph.D. candidate and four registered nurses working in clinical settings (one with an associate's degree, two with a baccalaureate, and one with a master's degree). During the first revision, we deleted two unnecessary questions. We modified the expression of questions and response options during the second revision. The revised draft was piloted on 47 clinical registered nurses online and the pilot data was not included in the final analysis. The final questionnaire consisted of three sections and a total of 41 questions: demographic and professional information (question 1-question 11), patterns of social media use (question 12-question 25), and professionalism on social media (question 26-question 41).

### 2.3. Ethical considerations

The study was approved by the university's Biomedical Research Ethics Committee (No. 2018261). During the survey, the main concepts and purposes of the study were elucidated to the attending nurses, and consent was obtained. The subjects were informed that the questionnaire was anonymous and that the potential revelation of information on personal social media was not involved. The subjects were noted that participation was voluntary and that they could abandon the survey at any time. The obtained data were saved with password and only aggregated data are reported.

### 2.4. Data collection

With the approval of the event organizers, the questionnaires were distributed at conferences and a continuing education program between August and September 2018. At each event, two rounds of data collection were conducted. Incomplete questionnaires were not included in the analysis.

### 2.5. Statistics

Descriptive statistics were employed to analyze the aggregated data. Means, standards deviations, medians, inter quarter ranges (IQRs), minimums and maximums were used where appropriate.

The analyses were performed using SPSS version 22 and Microsoft Excel 2013.

## 3. Results

A total of 1100 questionnaires were distributed. Of the collected questionnaires, 658 were complete, resulting in a 60% response rate.

### 3.1. Socio-demographic and work-related information of the participants

The participants were mostly nonreligious married female registered nurses with bachelor's degrees, working at tertiary public hospitals in the metropolitan area of Southwest China. Detailed socio-demographic and work-related information of the 658 participants is summarized in Table 1. The age of the participants ranged from 18 to 54 ( $34.1 \pm 7.6$ ) years. Nurses with bachelor's degrees accounted for 75.4% ( $n = 496$ ) of the sample. Nearly half (49.5%,  $n = 326$ ) of the respondents worked in the internal medicine or surgery department. The clinical nursing experience of the participants ranged from two months to 36 years (median, 10; IQR, 6.0–20.0). Thirty-eight percent ( $n = 252$ ) of the nurses were in management position (either head nurse or associate head nurse). Except for head nurses and associate head nurses, 35.2% ( $n = 143$ ) of the rest of the nurses had multiple

**Table 1**  
Demographic and professional information of the participants (N = 658).

Variable	Category	Number (n)	Percentage (%)
Sex	Male	21	3.2
	Female	637	96.8
Age	<25	45	6.8
	25–29	174	26.5
	30–39	281	42.7
	40–49	133	20.2
	≥50	25	3.8
Ethnicity	Han	641	97.4
	Other	17	2.6
Religion	No religion	616	93.6
	With a religion	42	6.4
Marital status	Unmarried	139	21.1
	Married	508	77.2
	Divorced/Widowed	11	1.7
Educational level	Diploma degree	9	1.4
	Associate degree	126	19.1
	Bachelor degree	496	75.4
	Master degree and above	27	4.1
Level of work hospital	Tertiary public hospital	563	85.6
	Secondary public hospital	77	11.7
	Community hospital	3	0.5
	Private hospital	15	2.2
Years of clinical nursing	≤ 1	33	5.0
	2–5	130	19.7
	6–10	174	26.4
	11–20	186	28.3
	21–30	107	16.3
	≥31	28	4.3
Work department	Internal medicine	162	24.6
	Operation Room	97	14.7
	Intensive Care Unit	86	13.1
	Oncology	77	11.7
	Surgery	67	10.2
	Other	169	25.7
Professional title	Primary title	344	52.3
	Intermediate title	193	29.3
	Senior title	121	18.4
Position	Assistant Head nurse	47	7.1
	Head nurse	205	31.2
	Staff Nurse	406	61.7

professional roles in the workplace, i.e., the combination of ward nurse and nurse educator and/or group leader.

### 3.2. Social media use

#### 3.2.1. Patterns of use

All the respondents were social media users, and most of them had registered on multiple social media platforms. Table 2 gives an overview of the sample's detailed adoption of social media platforms. Approximately 83% (n = 547) of the nurses had registered on two to four social media platforms. A total of 54.6% (n = 359) of the sample had two frequently used social media platforms; 28.1% (n = 185) had three. Most (93.5%, n = 615) of the participants declared that WeChat was their most frequently used social media platform. The results suggested that 56.4% (n = 371) of the sample spent one to three hours on social media per day; 13.2% (n = 87) nurses acknowledged that they spent more than six hours on social media daily. Regarding the question "who are the friends on your most frequently used social media?", 99.5% (n = 655) reported colleagues, 90.6% (n = 596) reported schoolmates, 85% (n = 559) reported relatives, and 18.1% (n = 119) reported strangers. In total, 93.3% (n = 614) of the sample disclosed multiple reasons for social media usage. There were 93.2% (n = 613) of the respondents claiming "receiving messages from work" as one of the reasons why they used social media. When asked, "Have you communicated work-related information with your colleagues via social media?" 14.6% (n = 96) professed "always", 67.2% (n = 442) answered "often", and 1.8% (n = 12) claimed that they had never communicated work-related information with colleagues through social media.

#### 3.2.2. Medical knowledge obtaining and sharing behavior

Nurses's medical knowledge sharing and obtaining behavior are shown in Table 3. Two percent (n = 13) of the nurses disclosed that they had never searched for medical knowledge on social media. On the printed questionnaires, the question "which social media is the one that you use most frequently to search for medical knowledge?" indicated the selection of a single answer and the Chinese character "most" was emboldened and enlarged. Nevertheless, 24.3% (n = 160) of the respondents chose more than one option. Around 12.4% (n = 82) of the participants presented other social media platforms that were not listed on the questionnaire. Among the remaining 403 participants, 45.9% (n = 185) claimed

that WeChat was their most frequently used social media platform to search medical knowledge, followed by BBS.DXY.COM (34.7%, n = 140), Zhihu (6.7%, n = 27), Tencent QQ (5.5%, n = 22), Sina Weibo (5.2%, n = 21), and Douban (2.0%, n = 8).

### 3.3. Professionalism on social media

#### 3.3.1. Patient-nurse interaction

Detailed information about patient-nurse interaction on social media is listed in Table 4. Although 38.3% (n = 252) of the nurses chose to accept a patient's "friend request", 63.5% (n = 418) of the respondents acknowledged that there were no patients on their most frequently used social media. Approximately half of the sample (45.4%, n = 299) had "sometimes" communicated with patients via social media.

#### 3.3.2. Patient information disclosure

Among all the participants, 86.0% (n = 566) claimed that they had never posted anonymous patient-related content and 13.4% (n = 88) confessed that they had "sometimes" posted anonymous patient information on social media. Regarding the witness of social media friends' disclosure of anonymous patient information, 48.6% (n = 320) of the nurses selected "never" and 46% (n = 303) selected "sometimes". Most of the respondents (65.7%, n = 432) had never witnessed identifiable patient information posted by their social media friends. A total of 32.5% (n = 214) of the nurses reported that they had "sometimes" witnessed identifiable patient information posted by their social media friends, while 7.6% (n = 50) reported that they had "sometimes" posted identifiable patient information on social media. When asked about colleagues' online professionalism, half (50.3%, n = 331) of the participants indicated that they had witnessed their colleagues' inappropriate social media posts "sometimes" and 49.5% (n = 326) reported "never".

The attitudes towards the online revelation of patient information diverged. Regarding the disclosure of identifiable patient information, 58.8% (n = 387) of the participants contended that it was "always inappropriate"; 39.8% (n = 262) selected "It depends". As to the exposure of anonymous patient information, 41.2% (n = 271) endorsed that it was "always inappropriate", while 56.4% (n = 371) believed that the appropriateness of the disclosure of anonymous patient information depends on the situation.

### 3.4. Social media and clinical nursing practice

Most of the nurses (84.3%, n = 555) professed that social media had positively influenced their clinical practice. A total of 94.4% (n = 621) of the respondents reported that their affiliation facilities had official social media accounts. When asked about whether their affiliation facilities had issued social media use regulations or guidelines, 52.7% (n = 347) of the sample responded "Yes", 14.6% (n = 96) answered "No", and 32.7% (n = 215) selected "I do not know".

## 4. Discussion

### 4.1. Social media is pervasive among nurses and WeChat is the most popular platform

The social media engagement rate in this survey is 100%. In Kung's study, 94% (N = 410) of the nurses indicated that they use certain social media platforms (Kung and Oh, 2014). Tuckett found that 93% (N = 112) midwifery graduate students were social media users (Tuckett and Turner, 2016). Another study that surveyed a group of healthcare providers that mainly consisted of nurses showed that 87.9% of the respondents were social media users

**Table 2**  
Nurses' adoption of social media platforms.

	Had Registered n (%)	Frequently Used <sup>a</sup> n (%)	The most frequently used n (%)
Tencent QQ <sup>a</sup>	647 (98.3)	590 (89.7)	33 (5.0)
WeChat <sup>b</sup>	647 (98.3)	657 (99.8)	615 (93.5)
Sina Weibo <sup>c</sup>	343 (52.1)	198 (30.1)	7 (1.1)
BBS.DXY.CN <sup>d</sup>	251 (38.1)	99 (15.0)	3 (0.4)
Zhihu <sup>e</sup>	141 (21.4)	53 (8.1)	0
Douban <sup>f</sup>	71 (10.8)	25 (3.8)	0
Instagram	26 (4.0)	8 (1.2)	0
LinkedIn	13 (2.0)	2 (0.3)	0
Facebook	24 (3.6)	7 (1.1)	0
Twitter	11(1.7)	5 (0.8)	0

<sup>a</sup> Log in at least once per week.

<sup>a</sup> An instant messaging software.

<sup>b</sup> A multipurpose app for messaging, mobile payment and other functions including social media.

<sup>c</sup> A Twitter-like Chinese microblogging platform.

<sup>d</sup> An online forum for healthcare providers and other biomedical professionals.

<sup>e</sup> A Chinese online question and answer platform that resembles Quora.

<sup>f</sup> A Chinese social media that resembles the combination of Goodreads, IMDb and Reddit.

**Table 3**  
Nurses' medical knowledge sharing and obtaining behavior on social media.

Questions	Options	Answers n (%)
Medical Knowledge Sharing Behavior Medical knowledge reposting	Never	14 (2.1)
	Sometimes	375 (57.0)
	Often	241 (36.6)
	Always	28 (4.3)
Original medical knowledge sharing (Examples: popular science writing, patient education materials)	Never	326 (49.5)
	Several times per year	110 (16.7)
	At least once per month	13 (2.0)
	At least once per week	5 (0.8)
	Irregular	204 (31.0)
Clinical cases/experiences sharing	Never	375 (57.0)
	Several times per year	87 (13.2)
	At least once per month	6 (0.9)
	At least once per week	7 (1.1)
	Irregular	183 (27.8)
Reliability and accuracy confirmation before reposting medical knowledge	Never	42 (6.4)
	Sometimes	191 (29.0)
	Often	140 (21.3)
	Always	285 (43.3)
Medical Knowledge Obtaining Behavior Have you searched medical knowledge on social media?	Never	13 (2.0)
	Sometimes	305 (46.4)
	Often	295 (44.8)
	Always	45 (6.8)
How many healthcare-related social media accounts have you followed or subscribed on your most frequently used social media?	Zero	157 (23.9)
	1–5	342 (51.9)
	6–10	141 (21.4)
	11–15	13 (2.0)
	16 and above	5 (0.8)

**Table 4**  
Patient–nurse interaction on social media (N = 658).

Questions	Options	Answers n (%)
Are there patients on your most frequently used social media?	Yes	240 (36.5)
	No	418 (63.5)
Have you received “friend request” from your patients on social media?	Never	272 (41.3)
	Sometimes	323 (49.1)
	Often	58 (8.8)
	Always	5 (0.8)
	Ignore	93 (14.1)
If you receive “friend request” from your patients, you will	Accept	252 (38.3)
	Decline	76 (11.6)
	Ignore	93 (14.1)
	It depends	237 (36.0)
Have you communicated with your patients via social media?	Never	319 (48.5)
	Sometimes	299 (45.4)
	Often	39 (5.9)
	Always	1 (0.2)
In your opinion, the communication between nurses and patients on social media is	Always appropriate	68 (10.3)
	Always inappropriate	78 (11.9)
	It depends	512 (77.8)

(Surani et al., 2017). The social media presence rate of physicians and surgeons varied, with a rate as low as 50.4% (Vardanian et al., 2013) to “nearly 100%” (Carlquist et al., 2018).

Our study suggested that WeChat was the most frequently used social media platform among Chinese registered nurses. The participants' inclination towards WeChat in our research is consistent with the findings of previous studies. WeChat is the most popular social media platform in China, and boasts over one billion monthly active users (Guo, 2016; Wang, 2015); it is also the most popular social media among Chinese urologists (Long et al., 2017). There is no available evidence to support that WeChat was a compulsory tool for scheduling purposes, work-related requests, or pick up shifts for Chinese nurses. However, from our experience in the clinical settings, WeChat is almost inseparable from work. Every department that the authors had worked had their own WeChat chat groups for nurses, doctors or both and lots of work-related information was exchanged through those chat groups.

Important announcements and notices were made face-to-face as well as in WeChat chat groups. Previous studies conducted in Western countries have shown that Facebook is the most-used social media platform among physicians and surgeons. In the meantime, doctors also used other social media platforms, such as You Tube, Twitter and LinkedIn. Similar to healthcare providers in Western countries, Chinese registered nurses used multiple social media platforms in addition to WeChat, including Tencent QQ, Sina Weibo, and BBS.DXY.COM.

Similar to nurses, their institutions are active social media adopters. More than 90% of the participants acknowledged that their institutions had official social media accounts. This finding resonates with the study by Zhang et al. (2018), in which 76.2% (537/705) of the included Chinese tertiary hospitals had official social media accounts, with WeChat being the most popular platform, followed by Sina Weibo. Despite the lack of official social media guidelines from Chinese professional organizations or

regulating bodies, more than half (52.7%) of the nurses in this study insisted that there were guidelines or policies regarding social media usage in their institutions. Chinese nurses' awareness of the policies regulating social media usage was higher than that in other studies (Fuoco and Leveridge, 2015; Langenfeld et al., 2016; Surani et al., 2017). The results suggested that different facilities had issued their own policies or guidelines regarding social media usage, but a formal and unified guideline is lacking.

#### 4.2. Nurses' professionalism is challenged

Approximately half of the participants in this study acknowledged that they had "sometimes" received "friend request" from their patients on social media. One study found a similar result, in which 47% of the participants answered that they had sometimes received "friend request" from patients (Duyms et al., 2017). In other studies this proportion was relatively lower, with a range from 6% to 19.4% (Bibault et al., 2014; Brown et al., 2014; Moubarak et al., 2011). As to nurses' reaction to patients' "friend request", 38.3% of our sample responded that they would accept them. Previous studies have found a much lower patients' "friend request" acceptance rate among physicians and surgeons, which fluctuated between zero and 2.6% (Brown et al., 2014; Klee et al., 2015; Moubarak et al., 2011). When patients become social media friends, nurses will be exposed to a highly jeopardizing situation and their professional image may be undermined. Firstly, health-care providers' use of social media covers both their professional and personal lives. Unprofessional content such as foul language, pictures with nudity, and inappropriate comments towards patients, colleagues, and institutions have been found on doctors and nurses' social media pages (Langenfeld et al., 2014; Levati, 2014). Secondly, our results suggested that most of the participants had searched and reposted medical knowledge on social media. Nurses are predisposed to distribute reliable as well as fake information on social media, which may result in irreversible consequences. It is therefore important for nurses to distinguish the false and repost cautiously. Furthermore, the Nursing and Midwifery Council stated that nurses should not use social media to build relationships with patients (Nursing and Midwifery Council, 2015). The policy statement of the American College of Physicians and the Federation of State Medical Boards directly discouraged physicians from accepting "friend request" from patients on social media (Farnan et al., 2013). Notably, these statements are made by professional associations in Western countries.

Our survey revealed that 45.4% (299/658) of the participants had sometimes communicated with patients through social media and 77.8% (512/658) of the sample thought the appropriateness of patient-nurse communication via social media depends on the circumstances. In Brown's study, only one of the 187 doctors admitted communicating with patients through social media (Brown et al., 2014). With the widespread adoption of social media, interpersonal communication has become more instantaneous and convenient and healthcare facilities are no longer the only place where dialogues between patients and healthcare providers take place. Studies have shown that online physician-patient communication can enhance patients' adherence to medical treatment (Faridi et al., 2008), facilitate patient education (Chandrasekaran et al., 2017) and assist in chronic disease management (Patel et al., 2015). However, there are also concerns regarding healthcare professionals' communication with patients via social media. One study showed that 78.6% (186/238) of the physicians believed that communicating with patients via social media could lead to medico legal issues, and 71.0% (169/238) thought that it violated patients' privacy (Daniel et al., 2018). One piece of news reported a nurse's violation of a patient's privacy by

contacting the patient via WhatsApp and Facebook (Farsaci, 2017). Furthermore, the content generated from patient-nurse communication on social media was perceived as private, yet the privacy policy of social media may not always protect privacy (NCSBN, 2011), and this content are predisposed to misuse. As a result, patients' confidentiality may be damaged. Thus, to avoid ethical and legal issues, caution should be taken when this mode of communication is used to interact with patients, and nurses should strictly follow local guidelines and policies.

The results suggested that 32.5% (n = 214) of the participants reported that they had "sometimes" witnessed identifiable patient information posted by their social media friends, which is higher than the rate of witnessing colleagues' post of identifiable information reported by residents (26%, 177/680) (Garg et al., 2016). Our study showed that the nurses' self-reported posting of identifiable information was lower than the reported rate of social media friends'. Previous studies have indicated that medical faculty reported peer-posting of unprofessional content more frequently than the report of self-posting. In our study, 39.8% (n = 262) of the respondents did not realize the danger of patient information exposure and answered that the appropriateness of the disclosure of identifiable patient information depended on the situation. It is worth noting that one study suggested that 40% of the respondents insisted that even the posting of anonymous patient information is unprofessional (White et al., 2013). Nurses' posting of patient information on social media is not a local phenomenon in China. Various news headlines have captured Facebook posts of patient images or improper comments towards patients forwarded by nurses in other countries (BBC News, 2016; Fox, 2018). Researchers have also uncovered nurses' and nursing students' demeaning comments towards patients on Twitter (De Gagne et al., 2019). Information posted on social media is permanent and highly public, and the posting of any material that could reveal patient identity is detrimental to nurses, patients and their families. The National Council of the State Boards of Nursing indicated that nurses must not share, post or transmit any patient information or information gained in a patient-nurse relationship (NCSBN, 2011). To protect patients privacy and regulate nurses' social media usage behavior, it is urgent for Chinese professional organizations or regulating bodies to establish a comprehensive guideline.

In this study, 50.3% (n = 331) of the participants had witnessed improper posts from colleagues. Previous studies have suggested that the rates of witnessing colleagues' improper or unprofessional materials were 73% (490/672) and 44% (68/153) respectively (Garg et al., 2016; White et al., 2013). Previous research have documented nurses and doctors' inappropriate posts. These posts included the following: complaints about colleagues, patients and workplaces, sexually suggestive photos, images of patients, illicit substance usage and alcohol consumption. Nurses' social media pages are readily accessible to the entire online community, including patients and regulators. Once patients are exposed to the inappropriate content, the public images and credibility of nurses are undermined. Once found by regulators, nurses are subjected to disciplinary actions or even dismissal from work (Ryan, 2016; NCSBN, 2011).

#### 4.3. Limitations

Several limitations exist in this study. First, the use of a self-administered instrument may reduce the reliability of the collected data due to social desirability bias. To alleviate this bias, we made the questionnaire anonymous and emphasized anonymity during the survey. Second, the 100% social media adoption rate may result from convenience sampling. It is likely that only nurses who actively used social media were interested in responding to

our survey. Third, it is highly possible that some nurses had separated their personal social media accounts from their professional ones, yet in our study this proportion could not be clearly determined. Further research is needed to understand whether nurses separated their personal and professional social media accounts and the exact degree of separation. Fourth, our study only reflected the social media usage and online professionalism of registered nurses in China, a country with a distinctive social media landscape, and the findings may not be generalizable to nurses in other countries. However, our findings are alarming with respect to the worldwide nursing community.

## 5. Conclusion

This study revealed Chinese registered nurses' social media usage patterns and online professionalism. Social media are prevalent among Chinese nurses and the most popular platform is WeChat. Chinese nurses used social media privately to receive news and relax and professionally to communicate work-related information with colleagues and receive work-related messages. Social media were also used to obtain and share medical knowledge. Patient-nurse interactions via social media were quite common and a few of the participants had received "friend request" from patients and communicated with patients via social media. Chinese nurses' professionalism was challenged. Patient information exposure was relatively common, as suggested by the results. Further studies should be carried out in different regions in order to gain a better understanding of nurses' social media use and online professionalism worldwide. This study also highlighted the need for Chinese guidelines regarding nurses' social media usage.

## Conflict of interest

No conflict of interest was declared.

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