

ORIGINAL ARTICLE

Use of social media for communicating about critical care topics: A Norwegian cross-sectional survey

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Funding information

Departmental funding only.

Background: Social media (SoMe) might be an alternative platform for communicating critical care topics to implement evidence-based practice in the intensive care unit (ICU). This survey aims to describe ICU nurses' and physicians' use of SoMe in general, and their perception of using closed Facebook-groups for receiving content on critical care topics.

Methods: A cross-sectional, web-based, anonymous survey was distributed to ICU physicians and nurses in four ICUs in autumn 2017 via an email-campaign. Descriptive statistics with rates, percentages and median numeric rating scale (NRS) scores, interquartile ranges are presented.

Results: The response-rate was 64% (253/ 394) including 210 nurses and 43 physicians. Overall, 93% had a SoMe-profile, and 77% had a profile on more than one network site. Facebook was the most used social network site, with 87% having a profile. Totally, 68% were daily users, but more nurses used Facebook daily vs physicians (81% vs 60%, respectively, $P = 0.006$). Nurses were also more positive toward being members of closed Facebook-groups aimed to exchange content on critical care topics (median NRS 9 (6-10) vs 6 (3-9), respectively, $P = 0.014$).

Conclusion: The majority of ICU nurses and physicians were active SoMe users, mainly for personal purposes, and Facebook was the most popular SoMe. Nurses used Facebook daily more frequent and were more positive toward content on critical care topics on Facebook than physicians. These findings might be relevant to customize future communication about critical care topics via SoMe.

1 | INTRODUCTION

Optimizing critical care in intensive care units (ICU) based on evidence-based practice (EBP), international consensus, and guidelines outlined from all available scientific knowledge is important to enhance patient outcomes.¹⁻³ The implementation of EBP remains a challenge and lack of effective communication is one among many other implementation barriers in the ICU.^{4,5} Gathering multi-professional teams for teaching and training purposes is particularly

demanding due to the busy ICU environment and the context in which critical care is provided.⁵ Moreover, traditional electronic professional hospital communication platforms generally require a login procedure onto a hospital server, limiting the accessibility and thus effective real time communication about EBP.

Social media (SoMe) are forms of electronic communications (websites and applications) facilitating the creation and sharing of information, ideas, personal messages, and other content via virtual communities and networks quickly, efficiently, and in real-time.⁶⁻¹¹

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Benefits of SoMe use in health communication include more frequent interactions with others, more available, shared and tailored information (with user generated content), and increased accessibility and widening access to information (to those not accessing information via traditional methods). Limitations are associated with quality concerns and lack of reliability of content, confidentiality and privacy.¹² In the critical care community the majority of critical care medicine conferences, journals, and societies use SoMe for education, research, and advocacy.¹³

SoMe has with its availability and interactivity changed the way people communicate worldwide,^{12,14} and might serve as a possible communication platform worthwhile to consider to improve implementation of EBP even in the high technological and busy ICU. Nurses and physicians are the main providers of critical care in the ICU, and EBP needs to be communicated within the interdisciplinary team to ensure that provided care is based on current professional knowledge.

Facebook is the most used SoMe,¹⁵ with 1.52 billion daily active users.¹⁶ In Norway, 81% of the adult population had a Facebook profile in 2018.⁹ Younger generations, who have grown up with the internet, use SoMe more frequently (96% in the age group 16-24 years), however, increased use is also described in older generations (23% in the age group 75-79 years).^{8,9} Education and profession could also influence use of SoMe¹⁷ and usage among ICU nurses and physicians could be different from the general public. ICU nurses' and physicians' use of SoMe and their view on SoMe-usage for professional purposes has yet not been studied.

The primary aim of this study was to describe ICU nurses' and physicians' use of SoMe in general, as well as their perception of using closed Facebook-groups for receiving professional content on critical care topics. The secondary aim was to describe ICU nurses' and physicians' habits of acquiring professional knowledge in general. The results from this study intend to inform the development of SoMe interventions using closed Facebook-groups as a communication tool for providing professional content on critical care topics in the ICU.

2 | METHODS

2.1 | Design and setting

An observational cross-sectional study using a web-based anonymous survey was conducted at four ICUs at Oslo University Hospital (OUH).

2.2 | Questionnaire development

The questionnaire was developed based on a Norwegian survey studying media use in the general public,¹⁸ and was adapted to reflect the specific ICU context. Questions were modified for clarity after pilot testing in a sample of five ICU nurses and fellow researchers. Modifications were related to the adaptation of the five-point-Likert scale to the 11-point numeric rating scale (NRS) with 0 indicating "not at all" and 10 "very much."

Editorial Comments

In this Norwegian survey on use of social media (SoMe) for communicating about critical care, it appears that the vast majority of intensive care unit nurses and physicians in that country are active SoMe users. This has implications for alternatives and choices for dissemination or retrieval of information about critical care topics.

The survey questions comprised 82 closed-ended items, grouped into five sections:

- demographics
- SoMe- and smartphone-habits
- use of Facebook including closed Facebook-groups and traditional hospital communication platforms
- frequency and preferences of reading professional literature and the perceived importance of eight methods of knowledge-dissemination aiming to optimize critical care
- perceived importance of seven critical care topics (multi-professional ward rounds, early enteral nutrition, pain-, agitation/sedation-, delirium-assessment and management, early mobilization and pressure ulcers prevention), and perceived quality on these topics in their ICU is not the scope of this study, but the answers are available in Appendix S1.

All questions had to be answered to complete the survey. See Appendix S2 for the full questionnaire.

2.3 | Sample

All ICU nurses and physicians in clinical work in one of the four ICUs were invited to participate in the survey through an e-mail campaign between 25 August 2017 and 21 September 2017. Initially, a list of 456 e-mail-addresses, provided by the head of departments, was entered into the electronically survey programme "Nettskjema" version 140.0 provided by the University of Oslo. After removing duplicates, 450 participants were invited via e-mail.

Three automated reminders were distributed 4, 16, and 21 days after the first invitation. In addition, efforts were made to achieve a high response rate through written and oral reminders in the ICUs, providing response-rate statistics and announcing a reward to the ICU with the best response-rate.

2.4 | Ethics

Permission to conduct the survey was obtained from the Regional Ethics Committee (2016/2281/REK sør-øst A), the data protection officer at OUH, and the respective heads of the different ICU departments. Participation in the study was voluntary and anonymous, and completing the survey implied informed consent.

2.5 | Statistical analysis

Descriptive statistics with percentages and 95% CI are presented for categorical variables unless stated otherwise. The 11-point NRS was interpreted as a continuous interval variable and results are presented with median and interquartile range with first (Q1) and third (Q3) quartiles. Differences between groups for categorical nominal variables were tested with crosstabs tables and Pearson Chi-square tests or Fischer exact test as appropriate, and with McNemar's test within group. Differences between groups for continuous skewed data were tested with the Mann-Whitney *U* test. *P* values ≤ 0.05 were considered significant. Statistical analysis was performed with IBM Statistical Packages for Social Sciences (SPSS version 25.0).

3 | RESULTS

3.1 | Sample demographics

The response-rate was 64% (Figure 1). Among the 253 participants, 210 (83%) were nurses- and 43 (17%) physicians. Overall, 74% were female and 61% were >40 years of age; however, age and gender were differently distributed between nurses and physicians (Table 1).

3.2 | SoMe and traditional communication platforms

Overall, 99% (97%-100%) of the respondents used a smartphone (not shown in table). Among eight listed smartphone-activities, 77% (71%-82%) spent most of their time on traditional communication (call, text and e-mail), whereas 63% (57%-69%) reported SoMe-use as one of three top activities (not shown in table). Spending most time on SoMe (as top three activities) was significantly more frequent by female than male (68% (61%-75%) vs 48% (35%-61%), respectively $P = 0.003$), by younger more than older than 40 years (76% (66%-84%) vs 55% (46%-63%), respectively, $P = 0.001$), and by nurses more than physicians (68% (61%-74%) vs 37% (23%-53%), respectively, $P = <0.001$) (not shown in table).

Overall, 93% (89%-95%) had a SoMe profile, and 77% (71%-82%) had a profile on more than one social network site. Among eight listed reasons for the use of SoMe, the non-professional use, ie contact with family/friends was reported by 70% (64%-75%) as an important reason, whereas only 13% (10%-18%) reported professional development (not shown in table).

Facebook was the most used SoMe network with 87% (83%-91%) having a Facebook-profile, and 68% (62%-74%) were daily Facebook-users (Figure 2). Having a Facebook-profile was evenly distributed among men and women (82% (70%-90%) vs 89% (84%-93%), respectively, $P = 0.102$), and among nurses and physicians (89% (84%-93%) vs 81% (67%-92%), respectively, $P = 0.197$) (not shown in table). A Facebook-profile was less common among those >40 years compared to those ≤ 40 years (81% (74%-87%) vs 97% (91%-99%), respectively, $P = <0.001$) (not shown in table). Daily Facebook-use varied between female and male (81% (74%-87%) vs 68% (54%-80%), respectively, $P = 0.047$), and between nurses and physicians (81% (75%-87%) vs 60% (42%-76%), respectively, $P = 0.006$), but was similar in those >40 years vs those ≤ 40 years (76% (68%-83%) vs 80% (71%-88%), respectively, $P = 0.455$) (not shown in table).

Among nurses, Instagram (66% (59%-73%)) was the second most popular SoMe followed by Snapchat (63% (56%-70%)). Among the physicians, Snapchat was the second most popular (49% (33%-65%)), followed by Twitter (47% (31%-62%)) and Instagram (47% (31%-62%)) (not shown in table).

Of all more traditional communication platforms, work-mail was used by all respondents, but daily use was less frequent than the reported use of Facebook (38% (32%-44%) vs 68% (62%-74%), respectively, $P = <0.001$) (Figure 2). Physicians used e-mail significantly more frequent on a daily basis than nurses (77% (63%-90%) vs 30% (24%-36%), respectively, $P = <0.001$), male more than female (60% (47%-72%) vs 30% (24%-37%), respectively, $P = <0.001$), but no difference was found in use of e-mail among the respondents ≤ 40 years and those >40 years (33% (24%-44%) vs 41% (33%-49%), respectively, $P = 0.226$) (not shown in table).

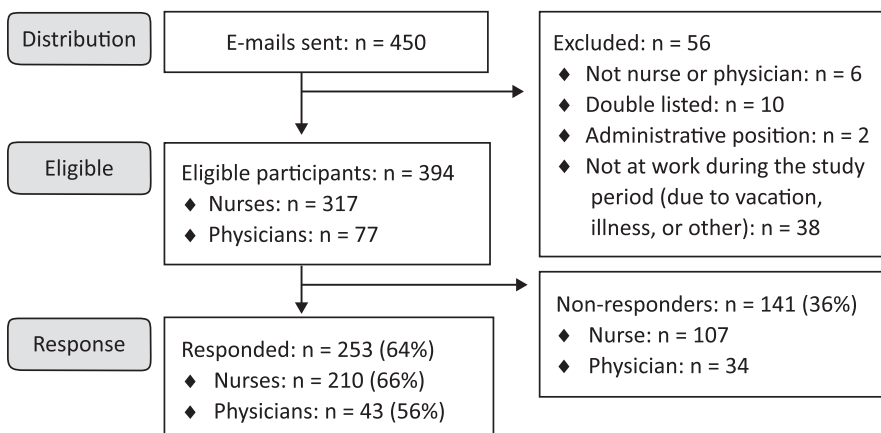


FIGURE 1 Flow diagram, distribution, exclusion and response

TABLE 1 Respondents' characteristics/ demographics

	All (n = 253)	Nurses (n = 210)	Physicians (n = 43)
	% (n)	% (n)	% (n)
Gender*			
Female	74 (188)	83 (174)	33 (14)
Age (years)*			
21-30	9 (24)	11 (24)	–
31-40	30 (75)	31 (64)	26 (11)
41-50	39 (98)	38 (80)	42 (18)
51-60	19 (49)	19 (39)	23 (10)
Older than 60	3 (7)	1 (3)	9 (4)
Highest level of education			
Nursing school	12 (31)	15 (31)	–
Medical school	1 (2)	–	5 (2)
Specialization	70 (176)	70 (147)	67 (29)
Master degree (MSc)	12 (31)	15 (31)	–
PhD	5 (13)	1 (1)	28 (12)
Experience in intensive care unit (y)			
<1	3 (8)	4 (8)	–
1-5	22 (57)	23 (49)	19 (8)
6-10	19 (47)	18 (38)	21 (9)
11-15	21 (53)	20 (41)	28 (12)
16-20	15 (37)	15 (31)	14 (6)
More than 20	20 (51)	20 (43)	19 (8)

Age and gender were significantly different distributed between nurses and physicians, statistical tests; Pearson chi-square test.

*P-value below 0.05 = significant.

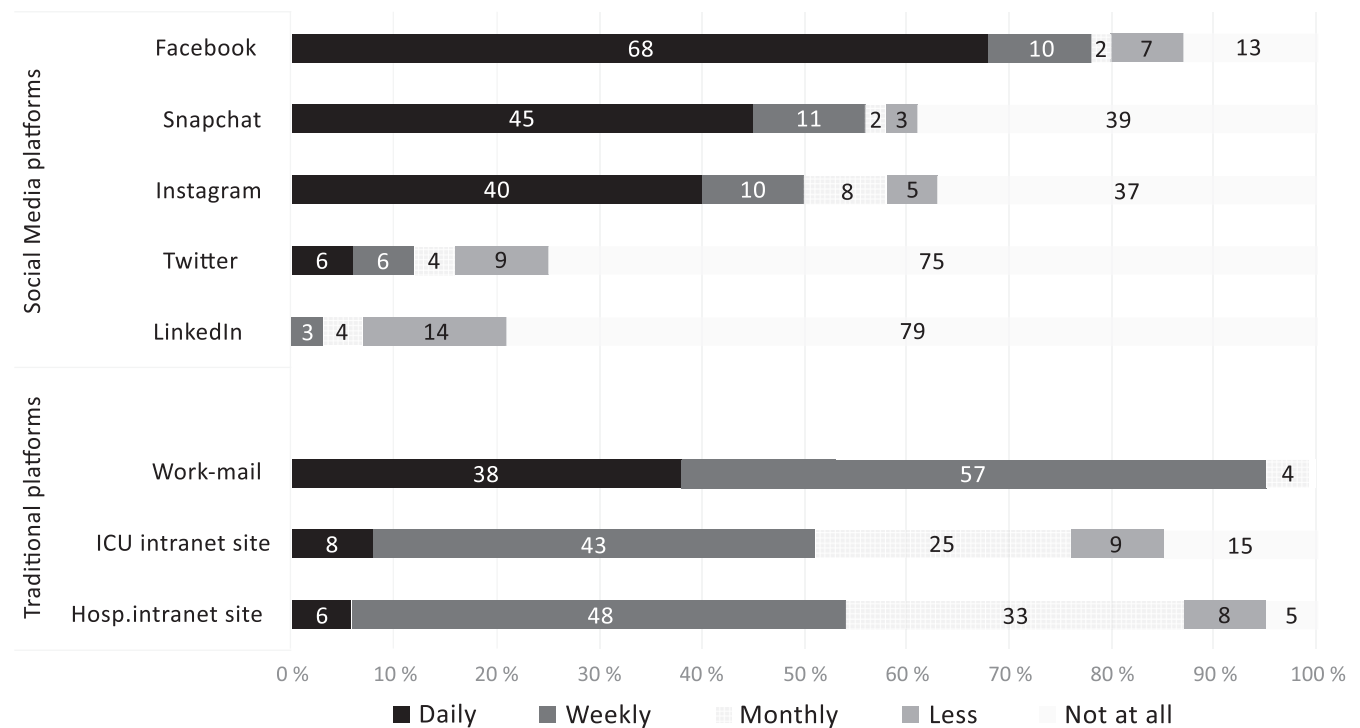


FIGURE 2 Frequency of critical care nurses' and -physicians' use of social media and traditional communication platforms (n = 253)

3.3 | Closed Facebook-groups as a professional communication-platform

Among the 186 nurses having a Facebook profile, 98% (95%-99%) were members of the ICUs' closed Facebook-group at work, whereas only 43% (26%-61%) of the 35 physicians having a Facebook-profile were aware of the ICUs' existing closed Facebook-group and only 31% (17%-49%) were members (not shown in table).

Nurses reported a more positive attitude than physicians toward joining closed Facebook-groups aimed to exchange professional content on critical care topics with median reported NRS-scores of 9 (6-10) vs 6 (3-9), respectively, ($P = 0.014$) (Table 2).

3.4 | Habits of acquiring professional knowledge in general

Physicians reported a higher frequency of reading professional literature daily than nurses (42% (27%-58%) vs 5% (3%-9%), respectively,

$P = <0.001$) (Table 3). Professional literature was in the survey exemplified as books, papers, web-sites (eg UpToDate), the eHandbook, organizations homepages, etc with professional content on critical care topics.

When reading professional literature electronically (PC, tablet, smartphone) the respondents were asked to choose the three most important sources among nine listed options: "e-guidelines, online version of international journals, online version of Norwegian journals, literature search in databases, papers through links on web-pages, papers through links on SoMe, papers received on mail, other, and don't read professional literature electronically." Nurses reported e-guidelines (62% (56%-69%)), research-papers via links on different web-sites (49% (42%-56%)) and research-papers received via e-mail (34% (28%-41%)) as the three most important sources (not shown in table). Physicians reported literature-search in databases (84% (69%-93%)), online version of international journals (77% (61%-88%)), and e-guidelines (40% (25%-56%)) as the three most important ones (not shown in table).

TABLE 2 ICU nurses' and -physicians' perception of professional use of closed FB-groups

	All (n = 217)	Nurses (n = 186)	Physicians (n = 31)	Difference (nurse/physician)
	Median NRS-score (IQR)	Median NRS-score (IQR)	Median NRS-score (IQR)	P-value
Accept to receive professional content on critical care topics on ICUs' closed FB-groups	6 (2-9)	7 (3-9)	5 (1-8)	0.117
Negative to receive professional content on critical care topics on ICUs' closed FB-groups	2 (0-6)	1 (0-6)	2 (0-7)	0.829
Accept to receive other work-related information on ICUs' closed FB-groups	7 (4-10)	8 (5-10)	5 (2-7)	0.002*
Negative to receive other work-related information on ICUs' closed FB-groups	2 (0-6)	1 (1-5)	5 (0-8)	0.075
Would you like to be a member of a group aimed to exchange professional content on critical care topics	9 (5-10)	9 (6-10)	6 (3-9)	0.014*

Note: Professional content on critical care topics: eg research papers, guidelines, congress-info and such. Other work-related information: eg social gatherings, schedules, staff-meetings and such. Statistical tests: independent-samples Mann-Whitney U test.

Abbreviations: NRS, numeric rating scale 0-10; (0 = "not at all" and 10 = "very much"); IQR, interquartile range presented with first (Q1) and third quartiles (Q3); FB, Facebook; ICU, intensive care unit.

*P-value below 0.05 = significant.

	All (n = 253) % (95% CI)	Nurses (n = 210) % (95% CI)	Physicians (n = 43) % (95% CI)	Difference (nurses/physicians) P-value
Daily	12 (8-16)	5 (3-9)	42 (27-58)	
Several times/wk	25 (19-30)	23 (18-30)	30 (17-46)	<0.001*
Weekly	39 (33-45)	41 (35-48)	26 (14-41)	
Monthly	22 (17-28)	26 (20-33)	2 (0-12)	
Annually	3 (1-6)	3 (1-7)	0 (0-8)	
Don't read "Professional literature"	<1 (0-2)	<1 (0-3)	0 (0-8)	

Note: Statistical analysis with Fischer exacts test.

*P-value below 0.05 = significant.

TABLE 3 ICU nurses' and -physicians' reported frequency of reading professional literature on critical care topics

Among the eight listed methods of dissemination of knowledge for optimizing adherence to recommended clinical practice, "Use of SoMe" was rated at the bottom by both nurses and physicians, with median NRS-scores of 6 (4-8) and 3 (2-6) respectively (Table 4). Nurses, however, rated the method significantly higher than physicians ($P = <0.001$) (Table 4).

4 | DISCUSSION

In the present cross-sectional study, describing SoMe-use among nurses and physicians in the ICU, the majority of the participants reported active use of SoMe, and especially Facebook, however, mostly for personal purposes. Nurses were more positive than physicians toward receiving professional content on critical care topics in closed Facebook-groups. On the other hand, physicians read professional literature more frequently than nurses and used traditional work e-mail daily more often.

The findings of active SoMe-use are consistent with findings of SoMe-use in the general public in Norway,^{18,19} and in other studies including healthcare providers, radiologists, emergency medicine physicians, and continuing medical education (CME) course participants.^{17,20-23} Only 13% reported professional development as one of the three most important reasons for using SoMe. This rather disappointing finding of low SoMe-use for professional purposes is in contradiction with 2,^{22,24} but in line with 3 previous studies.^{17,20,21} There

might be a potential for the use of SoMe for educational purposes in professional healthcare, but there are obvious barriers. According to Ranschaert et al²⁰, the 2 most cited reasons for not using SoMe were fear of mixing personal and professional information as well as lack of time. Tunnecliff et al²² found that the biggest obstacle for obtaining research information via SoMe was participants (71%) belief of the information being untrustworthy. Surani et al¹⁷ reported that less than 50% of physicians and nurses considered the available online information to be reliable. They still, however, encouraged patients to use it and to search about their illness online.¹⁷ The source of the information obtained is obviously still a large concern surrounding SoMe use.

Facebook was the most popular network site among both professions in the present study. Daily Facebook use was more common among females and nurses. Although having a Facebook profile was more common among those younger than 40 years, daily Facebook-use did not differ between younger and older than 40 years. Other studies have also found that age, gender, profession, and education, in addition to country of residence, all influence the frequency of SoMe use,^{17,22,23} as well as choice of SoMe-platforms.^{17,20,21,24} Facebook is described as the most gender- and age neutral SoMe-platform,^{18,19,25} indicating the potential for using Facebook to share professional content among health care providers. In a mixed method study among 317 health clinicians (mainly physicians and physiotherapists), the participants reported an overall improvement in attitudes toward SoMe (Twitter and Facebook) for professional

TABLE 4 ICU nurses' and physicians' perception of the importance of different methods for disseminating knowledge to optimize critical care -How important are the named methods on a scale from 0 to 10

	All (n = 253)	Nurses (n = 210)	Physicians (n = 43)	Difference (nurse/physician)
	Median NRS-score (IQR)	Median NRS-score (IQR)	Median NRS-score (IQR)	P-value
Lectures (international congresses/ courses/training days)	8 (7-10)	8 (7-10)	8 (7-9)	0.188
Interdisciplinary (physicians and nurses) collaboration (development of guidelines and other quality improvement projects)	9 (8-10)	8 (8-10)	8 (7-9)	0.001*
Traditional dissemination of articles and other educational material via e-mail	7 (5-8)	7 (5-8)	7 (5-8)	0.301
Use of Social Media for dissemination of articles and other educational material	6 (3-8)	6 (4-8)	3 (2-6)	<0.001*
Research in the ICU	8 (6-9)	8 (6-9)	8 (6-9)	0.933
Feedback of own practice using quality measurements	8 (6-9)	8 (6-9)	8 (5-9)	0.171
Simulation training (skills training, practical exercise)	9 (7-10)	9 (8-10)	8 (7-9)	0.002*
Supervision and counseling; clinically and in groups	8 (8-10)	9 (8-10)	8 (6-9)	0.001*

Note: Statistical tests with independent-samples Mann-Whitney U test.

Abbreviations: NRS, numeric rating scale 0-10; (0 = "not at all" and 10 = "very much"); IQR, interquartile range presented with first (Q1) and third quartiles (Q3); ICU; intensive care unit.

*P-value below 0.05 = significant.

development and an increase in knowledge.²⁶ Furthermore, 70% of the respondents indicated that the education they received through SoMe had changed the way they practice, or intended to practice.²⁶ If Facebook is useful to improve standards of critical care in the ICU remains unsettled and should be explored in future studies.

The most important challenge with using Facebook to provide professional content on critical care topics, is probably the critical care providers' perception of using Facebook for this purpose. In comparison between lectures, interdisciplinary collaboration, simulation training, supervision and counselling, and dissemination via e-mail, both professions in the present study rated the use of SoMe lowest for optimizing critical care practice. This is consistent with previous findings,²² and indicates that currently traditional methods are perceived as more important to optimize critical care than use of SoMe. We found, however, that nurses were more positive than physicians toward being members of closed Facebook-groups aimed to exchange professional content on critical care topics, and toward receiving professional content in already existing Facebook-groups. Of concern, only 43% of the physicians were even aware of the existence of these groups. Attitudes and habits of learning, and educational behavior obviously seem to differ between nurses and physicians. Nurses reported a lower frequency of reading traditional hospital e-mail and professional literature than physicians in the present study, and in addition, they preferred research-papers via links on different web-sites when reading professional literature electronically. Consequently, we might assume that there is a higher benefit potential among nurses than physicians by using closed Facebook-groups for disseminating professional content on critical care. However, the nurses were younger, used Facebook more frequently, and have a lower professional degree than the physicians. In agreement with this, it has previously been shown that favorable attitudes toward SoMe among CME course participants were associated with younger age, using SoMe frequently, and professional degree.²³ We might speculate if attitudes may change in the future, when younger physicians more familiar with SoMe take over as consultants and chairs in the ICUs.

Finally, SoMe-use can obviously be a distraction at the workplace,¹⁷ and SoMe-applications are automatically stopped on the hospital computers by the hospital network at OUH. The participants in the present study were considered to be aware of this aspect, and we have to emphasize that their answers regarding professional content on Facebook is interpreted related to their free time. It is therefore reasonable to assume that perhaps the biggest challenge with SoMe-use for professional development, is that the health care providers are not interested in using their free time on professional content. This aspect and concern, must be acknowledged and addressed in future studies.

4.1 | Strengths and limitations

This study achieved a response-rate of 64%. A higher response-rate would be desirable to get a study sample accepted as representative of the overall target population. A lower response-rate is

however common in electronic surveys.²⁷ The electronic survey programme "Nettskjema" had limitations partly because of keeping the survey anonymous, making an attrition analysis impossible. We distributed the survey on e-mails and those rarely reading their e-mail on a regular basis might be under-represented in the study, in spite of reminders in the ICUs to increase survey participation.

A strength in the present survey is that there were no missing data due to mandatory questions. However, statistical challenges occurred anyway because of skewed samples. Few responders were without Facebook or SoMe-profiles, and just a few physicians were younger females and few nurses were older males. The sample is representative for the two professions in the study ICUs, but the skewed groups provided statistical challenges in addition to the lower number of physicians. Another limitation is that an analysis about concomitant use of different SoMe platforms was not performed, even if this could be interesting.

The relatively small sample size, encompassing a single hospital, limits the generalizability of the results to a larger population. Other limitations include weakness of collecting self-reported information (eg response bias) via a non-validated survey questionnaire and the lower participation from physicians.

5 | CONCLUSION

The majority of ICU nurses and physicians were active SoMe users, mainly for personal purposes, and Facebook was the most popular SoMe. Nurses used Facebook daily more frequent and were more positive toward content on critical care topics on Facebook than physicians. These findings might be relevant to customize future communication about critical care topics via SoMe.

CONFLICT OF INTEREST

The authors have no conflicts of interest.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

How to cite this article: Petosic A, Sunde K, Beeckman D, Flaatten HK, Wøien H. Use of social media for communicating about critical care topics: A Norwegian cross-sectional survey. *Acta Anaesthesiol Scand.* 2019;63:1398-1405. <https://doi.org/10.1111/aas.13449>