ORIGINAL ARTICLE

Annals of Agricultural and Environmental Medicine 2023, Vol 30, No 1, 171–176
www.aaem.pl

Social media literacy among nursing students during the COVID-19 pandemic – does year of study matter? A nationwide cross-sectional study

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Cieślak I, Łuszczki JJ, Panczyk M, Nowak-Starz G, Wawrzuta D, Jaworski M, Gotlib J. Social media literacy among nursing students during the COVID-19 pandemic – does year of study matter? A nationwide cross-sectional study. Ann Agric Environ Med. 2023; 30(1): 171–176. doi: 10.26444/aaem/162219

Abstract

Introduction and Objective. Research to date indicates that student competencies in various dimensions of social media use vary depending on, for example, the field of study or stage of education. The aim of the study was assessment of social media literacy in a group of undergraduate nursing students, based on the year of study.

Materials and method. Respondents: 679 nursing students from 11 Polish medical universities who began or continued their education during the COVID-19 pandemic. First-year students (N = 397, 58.73%) and women (N = 589, 87.13%) constituted the largest group. The Perceived Social Media Literacy Scale was used. Statistical analysis used the Kruskal-Wallis one-way analysis-of-variance-by-ranks to analyse differences in PSML scores, and Dunn's test to analyse differences in PSML scores between individual years of study ($\alpha = 0.05$).

Results. The level of social media literacy between students differed significantly ($p < 0.001$). Students rated their technical competency the highest ($H = 29.722$, $p < 0.001$), social relationships ($H = 20.946$, $p < 0.001$) and informational awareness ($H = 21.054$, $p < 0.001$) the lowest. The lowest scores in the self-assessment of social media literacy were noted among first-year students ($M = 55.85$, $Max = 70.0$; $p < 0.001$), and the highest among second-year students ($M = 60.99$, $Max = 70.0$; $p < 0.001$).

Conclusions. Nursing students rated their competency lowest in the sphere related to verifying the content of messages appearing on social media, which may have a significant impact on their professional competencies. Differences in the level of social media literacy among students of different years of study should be taken into account when designing training in this field.

Key words

COVID-19 pandemic, social media literacy, undergraduate nursing students, year of study, social media competency

INTRODUCTION AND OBJECTIVE

The emergence of the social media (Facebook, 2004; Twitter, 2006; YouTube, 2005) [1] on a world scale has changed the way information, including health information, is created and disseminated [2]. Research has shown a regularly increasing percentage of people who seek health information online, mainly through the social media [3]. This phenomenon has been affecting not only the members of the general population and not professionally involved in healthcare, but also healthcare professionals and students in various fields of medicine or health sciences [4, 5].

Social media generate interactions between people. They are used for communication and contribute to the creation, exchange and discussion of information, including health information. On the one hand, they are considered by some to be a public health threat, due to the observed phenomenon of the spread of false information, and the risk of users making inappropriate decisions. On the other hand, social media represent an important tool for public health institutions that can facilitate their efforts to promote the health of the population [6].

The phenomenon of social media use has increased significantly following the outbreak of the COVID-19 pandemic in March 2020. With the need for rapid adaptation to the lockdowns, physical distancing, new working conditions, increased use of telemedicine, and digitalisation of healthcare systems, it has become naturalthe for social media to be used more frequently, also by healthcare professionals and students [7, 8].

However, the outbreak of the COVID-19 pandemic resulted in an increase in infodemia [9], and a surge in false health information being available online, particularly on the social media [10, 11]. The proliferation of misinformation has also been facilitated by the use of modern technologies, such as algorithms, artificial intelligence (AI) and machine learning [12].

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Received: 04.01.2023; accepted: 13.03.2023; first published: 22.03.2023

There are several definitions of the concept of social media literacy. In broad terms, the concept is based on knowledge gained through media literacy. The definition of social media literacy should take into account the specific characteristics of these platforms, including the social interactions generated in them, the possibility for users to create content, the large amount of information available on social media, and the ability to filter iformation [13].

Scientific literature identifies many concepts and models for measuring social media literacy. Authors are in dispute over a definitive method to operationalise and measure the use of social media, primarily because social media are evolving much faster than our knowledge about how they work [14]. Initial concepts addressed only the technical dimension of social media use; however, as the number of users and likely interactions have increased, the scope of research has broadened considerably [15]. One of the most recent concepts that brings together all the current issues related to social media use is the model by Tandoc et al., in which a social media literate person has the ability to read, assess credibility, and create relevant content using social media. Social media literacy itself combines four domains: technical competency, informational awareness, social relationships and privacy, and algorithmic awareness [16].

The international literature also points to the need for university education in this area, as research carried out so far consistently demonstrates a high level of students' technical skills, and a grossly inadequate ability to assess the credibility of published information, privacy protection, and a low level of knowledge about the functioning of algorithms and AI [17, 18].

The vast majority of research on social media literacy conducted during the COVID-19 pandemic involved students from a single discipline (e.g. medical universities, technical universities, etc.), a single field of study, or even a single university, with no consideration given to differences related to the year of study at university [19–22]. In our opinion, the analysis of social media literacy by year of study may be vital for expanding existing knowledge in this field.

Therefore, the authors of this study adopted a hypothesis (H1) that third-year students would present a higher level of social media literacy, compared to first- and second – year students. In terms of H1, four additional hypotheses were specified and statistically analysed:

1) H1a – third-year students will have the highest level of social media literacy in terms of technical competency.
2) H1b – third-year students will have the highest level of social media literacy in terms of social relationships
3) H1c – third-year students will have the highest level of social media literacy in informational awareness
4) H1d – third-year students will have the highest level of social media literacy in privacy and algorithmic awareness

The study aimed to assess the social media literacy in a group of undergraduate nursing students in relation to the year of study.

MATERIALS AND METHOD

A cross-sectional, national online survey study was carried out from November – December 2021. All 12 medical universities in Poland offering undergraduate nursing programmes were invited to participate in the study.

Students enrolled in a 3-year-long undergraduate nursing study programme (BA degree) were eligible for the study. The study group consisted of students who began (first-year students) or continued their university education (second- and third-year students) during the COVID-19 pandemic. The detailed timing of study entry in the context of the outbreak of the COVID-19 pandemic in the group of nursing students is shown in Figure 1.

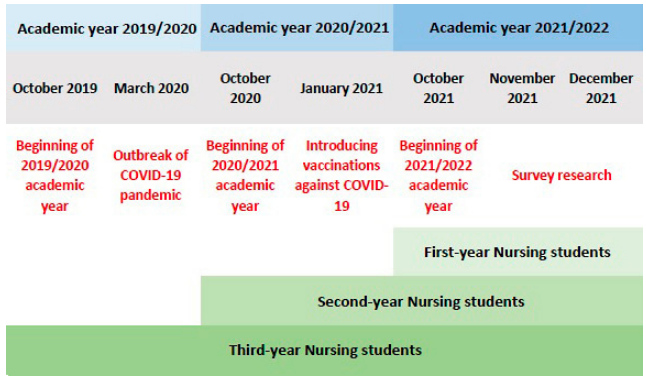

Figure 1. Timeline of the start of university education by respondents in the study

The total potential number of study participants was 5,122 students from 11 universities. The participants were recruited by coordinators at universities which had agreed to participate in the nationwide study. Each coordinator was knowledgeable about the purpose of the study, the distribution method of the research tool, and the principles of supervision over data collection. The coordinators of the survey were employees of the universities which agreed to participate in the survey. They sent out a link to the survey to the year's students representatives of all undergraduate years. The year's representatives then shared the link among the students. The mailing was repeated 3 times. The data package was returned by 679 students (response rate – 13.3%). With this sample size and the total number of undergraduate nursing students in Poland (N = 5122), the error margin was 3.50% (95% confidence level and a proportion of 0.50).

The study used the Perceived Social Media Literacy Scale (PSMLS), published in 2021 by Tandoc et al. [16]. This scale is used to measure subjective perceptions of one's own social media literacy. The tool can be used both to assess perceived social media literacy in order to implement appropriate educational interventions among different groups, as well as to evaluate the effectiveness of educational programmes aimed at increasing the social media literacy of the participants. The PSMLS consists of 14 statements rated on a 5-point Likert scale (1 – strongly disagree to 5 – strongly agree). The score ranges from 14–70 points. The scale is multifactorial and contains 4 subscales: technical competency (e.g. 'I know how to create an account on social media'), social relationships (e.g. 'I know the copyright laws governing social media platforms), informational awareness (e.g. 'I know how to verify whether what is shared on social media is correct'", and privacy and algorithm awareness (e.g. 'Social media sites, such as Facebook, control what I see on social media').

The reliability of the scale in the study by Tandoc et al. amounted to 0.89. No norms for the scale have been published in the available version of the scale, and the judgment of the students' scores is based on the subjective view of the authors. For the purposes of this study, the scale was translated into

Polish using a double translation. The translated scale met the basic psychometric properties (reliability – α = 0.93).

Data collections. The questionnaire was distributed with the aid of the Lime Survey web platform. The link to the survey was shared with 11 coordinators at the participating universities. The mode of survey distribution was determined by the limited chance for direct contact with the respondents, linked to restrictions introduced by the Minister of Health related to the COVID-19 pandemic. Thus, online study was the recommended approach, enabling quick access to the study group and ensuring security [23, 24]

Ethical consideration. The study protocol was approved by the University's Ethics Committee (IRB Approval No. KB/76/2021). Before entering the study, participants were assured of their anonymity and the confidentiality of the data collected. No personal data, including computer IP, were collected. To ensure the anonymous nature of the questionnaire, it was not possible to track sensitive personal data.

Data analysis. All calculations were performed with STATISTICATM 13.3 software (TIBCO Software, Palo Alt (CA), USA). For all analyses, a p-value of <0.05 was considered statistically significant. Categorical variables were described with descriptive statistical methods. For the categorical variables, the following measures were determined: number (N) and frequency (%), M (mean) and SD (standard deviation). A non-parametric Kruskal-Wallis rank-sum ANOVA test for multiple independent groups was used to measure differences in the level of social media literacy between first-, second- and third-year undergraduate nursing students (Kruskal-Wallis one-way analysis-of-variance-by-ranks t). Dunn's test (*post-hoc* analysis; p-value calculated for each pair) was used to analyse differences in the level of social media literacy between students in each year of study (comparisons: Year 1 and Year 2, Year 1 and Year 3, Year 2 and Year 3).

RESULTS

Sample characteristics. A total of 679 Polish undergraduate nursing students participated in the study. The largest group of study participants consisted of first-year students (N = 397, 58.73%) and women (N = 589, 87.13%), which is similar to the average gender distribution in nursing faculties in Poland. The mean age of participants was 21.02 (SD = 4.04). The characteristics of the study group are presented in Table 1.

Perceived Social Media Literacy level among undergraduate nursing students. The reliability of the Perceived Social Media Literacy Scale in the group of undergraduate nursing students was very high (Cronbach's Alpha coefficient – 0.93).

First-year students showed the lowest level of self-assessment of social media literacy across the scale, whereas the second-year students had the highest score. In 3 out of the 4 areas, the second-year students rated their competency highest. In the study group of nursing students, there were statistically significant differences in the level of social media literacy, both in the overall dimension of the scale, and in all 4 analysed areas (Tab. 2).

Table 1. Characteristics of study group (N = 679)

Nursing Department	N (%)
Medical University of Białystok	179 (26.48)
Jagiellonian University Medical College	132 (19.53)
Pomeranian Medical University	119 (17.6)
Medical University of Łódź	61 (9.02)
Poznan University of Medical Sciences	59 (8.73)
Medical University of Warsaw	50 (7.4)
Medical University of Gdańsk	21 (3.11)
Medical University of Lublin	20 (2.96)
Jan Kochanowski University Medical College	17 (2.51)
Medical University of Silesia	14 (2.07)
Ludwik Rydygier Collegium Medicum in Bydgoszcz	4 (0.59)
Year of study	
Year 1	397 (58.73%)
Year 2	176 (26.04)
Year 3	103 (16.24)
Gender	
Female	589 (87.13)
Male	66 (9.76)
Refusal to answer	21 (3.11)
Age (Years)	
M ± SD	21.02 ± 4.04
Range	18.0 – 60.00

Table 2. Perceived Social Media Literacy level among undergraduate nursing students

	Year of study	M	SD	Mini	Max	H	p-value*
Total PSMLS	Year 1	55.85	11.92	14.0	70.0	26.799	**<0.001**
	Year 2	**60.99**	6.61	42.0	70.0		
	Year 3	58.69	5.11	40.0	70.0		
Technical competency	Year 1	21.65	4.90	5.0	25.0	29.722	**<0.001**
	Year 2	23.50	2.21	15.0	25.0		
	Year 3	**23.90**	1.79	15.0	25.0		
Social relationships	Year 1	10.97	2.82	3.0	15.0	20.946	**<0.001**
	Year 2	**11.76**	2.25	4.0	15.0		
	Year 3	10.50	2.20	5.0	15.0		
Informational awareness	Year 1	11.23	2.90	3.0	15.0	21.054	**<0.001**
	Year 2	**12.48**	2.32	6.0	15.0		
	Year 3	11.64	1.77	6.0	15.0		
Privacy and algorithmic awareness	Year 1	11.99	2.84	3.0	15.0	26.950	**<0.001**
	Year 2	**13.25**	1.65	9.0	15.0		
	Year 3	12.65	1.38	10.0	15.0		

M – mean; SD – standard deviation.
* Kruskal-Wallis one-way analysis-of-variance-by-ranks test

Perceived Social Media Literacy level by 4 areas and year of study. A detailed analysis of the differences in social media literacy scores between first-, second- and third-year undergraduate nursing students showed statistically significant differences between students in each year of study. The specific differences depended on the social media literacy skill area analysed (technical competencies, social relationships, informational awareness, privacy and algorithmic awareness).

When analysing overall social media literacy, second-year students scored the highest and first-year students scored the lowest. In addition, there were statistically significant differences between first- and second-year (<0.001), as well as second- and third-year students (0.025). In contrast, no

differences were observed between first- and third-year students.

As regards the students' technical competency, again, first-year students' self-assessed score was the lowest. The self-assessed social media literacy of the second- and third-year students was very similar (no statistically significant differences); nevertheless, it was higher than that of the first-year students.

As for social relationships with the use of social media, third-year students rated themselves lowest, and at a very similar level to first-year students. This is the only category in which there were statistically significant differences between students of all years of study.

Within the informational awareness category, i.e. the ability to verify the reliability of information, first-year students again scored lowest, while second-year students scored highest. No significant difference was observed between first- and third-year students.

With regards to privacy skills and awareness of the functioning of algorithms, first-year students rated their competencies lowest, and second-year students highest. Differences were observed between students in Year 1 and Year 2 (0.000), as well as Year 2 and Year 3 (0.010). No differences were observed between first- and third-year students.

Detailed data on differences between first-, second- and third-year undergraduate nursing students in the overall PSMLS scale and in all its subscales, are presented in Table 3.

Table 3. Analysis of differences between first-, second- and third-year undergraduate nursing students in the overall PSMLS scale and all its areas

Total PSMLS	Year 1	Year 2	Year 3
Year 1	-	< 0.001	0.604
Year 2	< 0.001	-	0.025
Year 3	0.604	0.025	-
Technical competency			
Year 1	-	< 0.001	< 0.001
Year 2	< 0.001	-	1.000
Year 3	< 0.001	1.000	-
Social relationships			
Year 1	-	0.018	0.016
Year 2	0.018	-	< 0.001
Year 3	0.016	< 0.001	-
Informational awareness			
Year 1	-	< 0.001	1.000
Year 2	< 0.001	-	0.021
Year 3	1.000	0.021	-
Privacy and algorithmic awareness			
Year 1	-	< 0.001	1.000
Year 2	< 0.001	-	0.010
Year 3	1.000	0.010	-

DISCUSSION

The self-assessed social media literacy of the entire study group of nursing students as measured by the PSMLS, may be regarded as being moderately good; however, no norms for the scale have been published in the available version of the scale, and this judgement is based on the subjective view of the authors of this study. The highest average score obtained by the second-year students was 60.99 out of 70 possible points on the PSMLS scale. Taking into account the fact that the surveyed nursing students, due to their age, belong to the digital natives generation, and would be expected to have high social media literacy, in our opinion this result is indicative of their unsatisfactory level of social media literacy.

The area in which the study participants rated their competencies highest were technical skills. Technical competencies related to social media use refer to skills such as creating or deleting an account, creating and publishing a post, etc. Thus, an area of skills in which the growing generation of digital natives has been proficient since early childhood. Therefore, this result is not surprising to the authors and is in line with the findings of other researchers [25].

The next analysed areas were informational awareness, privacy, and algorithmic awareness. The mean self-assessed score in informational awareness was 11 (Year 1 and Year 3) and 12 (Year 2), out of 15 points, while privacy skills and algorithmic awareness ranged from 11 (Year 1) to 13 (Year 3), out of 15 points.

In the opinion of the authors, despite the fact that the students rated their competencies quite high, these fields require continuous improvement to ensure that students are safe online, and have the right level of social media literacy to use this medium to obtain reliable medical information, both during their studies and in the future.

The phenomenon of health information misinformation has been described in the literature as a significant threat to public health, caused by social media. The COVID-19 pandemic particularly highlighted the problem of infodemia. In addition, researchers have begun to notice a 'news-find-me perception' (NMFP) phenomenon among users. NMFP is defined as the lack of active search for information on social media in the belief that a person will, nevertheless, be indirectly informed in this regard through general Internet use [26]. Today, teaching with the use of digital media, which includes education using social media, is increasingly common in higher education. Students may use social media for a variety of purposes, such as preparing for seminars, communicating with friends and lecturers, or searching for information to update their knowledge or evidence-based practice [27–29]. It is crucial for nursing students, when searching for health information online, to be able to critically evaluate it and verify its accuracy. In this case, the NMFP phenomenon is particularly dangerous as it can significantly interfere with students' learning about science through social media. It should also be remembered that students' self-assessment of knowledge and skills in this area is subjective; therefore, when making inferences one must always take into account the risk that students have overestimated their knowledge or skills.

The lowest self-assessed social media literacy scored were noted in the area of social relationships and amounted to 10 (Year 1 and Year 2) and 11 (Year 2) out of 15 points for this subscale, respectively. Social media literacy, involves proactively responding to posts published by friends, knowledge of social media policies and copyright related to sharing content on social media, as well as the ability to handle conflicts that arise on social networks [16].

The outbreak of the COVID-19 pandemic has resulted in an increase in the number of social media users [30]. Therefore, it may seem surprising that in the current study, third-year students rated their social relationships skills lowest. This is presumably because these are individuals who began their university education a few months before the outbreak of the COVID-19 pandemic, should be most extensive social media literate, and thus have a higher self-esteem regarding social relationships. In the international literature, there exists research indicating the existence of a correlation between engagement with social media, satisfactory knowledge of social media copyright and the resulting high level of e-professionalism among nursing students [31–34]. In the authors' opinion, this relationship may be due to the fact that third-year students have been active users of social media for the longest time; therefore, it is possible that their awareness of their own limitations and unsatisfactory level of skills in the context of social relationship is significantly higher. At the same time, this result may indicate insufficient training in this area during university education, as the current Polish standards for nursing education do not include issues related to digital media literacy, including social media [35].

In the graduate profile of the nursing student presented by Zupniac et al., electronic devices promote the acquisition of knowledge. The students further stated that 'media literacy' was rarely taught or not taught at all at university. Future nurses were unanimous in their support for the idea of introducing this issue in the curriculum [36]. What is emphasized in the literature is the importance of high social media literacy levels among nursing students and professionally active nurses, not only in terms of learning, but also in terms of improving patient care skills. Access to online health information, including social media, may significantly influence the quality of nursing practice [37].

In line with the assumptions of the current study, the level of social media literacy in the studied group of nursing students also differed significantly between students at different years of study, despite the group being of similar age and belonging to the same generation of digital natives. However, in our opinion, based on its timing in the students' educational pathway, the outbreak of the COVID-19 pandemic may have been an important factor contributing to these differences. As shown in Figure 1, the study group of nursing students was affected by the COVID-19 pandemic outbreak at different stages of its participants' education. The first-year students began their university education during the pandemic, having completed their secondary education during the ongoing lockdowns, whereas the second-year students spent their last semester of secondary school in distance learning, and started their university education at the beginning of one of the subsequent waves of the COVID-19 pandemic; thus, they were learning remotely for most of the time.

The third-year students, on the other hand, started their university education in the hybrid or fully online mode after less than half a year of regular on-site education (October 2019 – March 2020). Both the available literature and the results of our own study point to the urgent need to introduce targeted educational interventions on social media literacy among nursing students. This would result in the improvement of students' digital competenc, and would increase their confidence in using social media, primarily in the context of e-professionalism and proficiency in finding reliable medical information. This, in turn, would result in a more efficient and effective transition from study to nursing practice (study-to-work transition) [36, 38–39].

Strengths

Our findings come from the first nationwide study of social media literacy among nursing students. The presented results may have important practical implications and may form the basis for designing extracurricular activities in the field of social media use, as well as learning through social media.

Limitations of the study. The fact that it was a survey in which students self-assessed their social media competencies is an important limitation of the results of the presented research. The level of skills declared by the respondents may have been over- or underestimated. Assessing students' actual social media literacy would require a practical skills test which, for obvious reasons (survey time, logistical capacity and survey cost), is not feasible, especially in a representative sample of students. Therefore, the available international literature on the measurement of students' digital literacy in the broadest sense accepts surveys as a possible and reliable form of research [40].

Another limitation of the presented research results is also the unequal size of the groups of surveyed students representing all years of study, and the over-representation of first-year students. However, this limitation is objective in nature and results from the optional nature and specificity of online surveys.

An additional limitation of the survey may be sample bias, which is related to the population taking part in the survey. Due to the fact that the survey focused on social media and was conducted in an online format, there is a risk that the survey was completed by students who were more interested in the topics covered.

Further research. Given the rapidly changing trends in social media use among digital natives, including medical students, further research should continue and account for emerging new social media and previously unobserved student behaviour related to the use of these new media. In addition, demographic characteristics (e.g. gender) should also be taken into account in further research. This is because research conducted to date indicates that they significantly differentiate the level of social media literacy in the groups studied.

Furthermore, research projects analysing students' digital competencies should be of a mix-method research nature and, in addition to students' self-assessment, it would be worthwhile to include qualitative research, e.g. participant observation or observation in action with the possibility to analyse students' practical skills (e.g. a performance task) in the studied area of social media literacy.

CONCLUSIONS

The analysed groups of first-, second- and third-year undergraduate nursing students differ significantly in terms of social media literacy, especially as regards skills for online privacy protection and informational awareness, i.e. the ability to verify information sources and distinguish authentic news from fake news. Therefore, extracurricular activities should include training students in the use of social

media in the areas indicated, due to the fact that social media are and will increasingly be used by students, graduates, and later by practising nurses to search for broadly defined medical information.

Furthermore, when designing social media education, it is important to account for differences in social media literacy between students in different years of university education. The adaptation of the learning process to the students' competencies may have a positive impact on the quality and effectiveness of education with the use of new technologies.

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