

ORIGINAL RESEARCH

Healthcare misinformation: Recognition and response in pre-licensure nursing education

Terri W. Enslein*

College of Nursing, Xavier University, Cincinnati, OH, USA

Received: January 23, 2024

Accepted: May 14, 2024

Online Published: September 28, 2021

DOI: 10.5430/jnep.v14n8p53

URL: <https://doi.org/10.5430/jnep.v14n8p53>

ABSTRACT

Background and objective: The amount of medical misinformation accessible to the public presents challenges for the healthcare community. Nursing graduates require knowledge, skills, and attitudes to enter practice prepared to recognize and respond to misinformation. The aim of the study was to assess the student nurse's ability to recognize and respond to misinformation in the media.

Methods: A total of 14 prelicensure students were recruited for a qualitative study involving watching/listening to birth-related media containing misinformation. Ability to recognize and respond to misinformation was evaluated using reflective journals guided by Tanner's Clinical Judgment Model.

Results: Evidence of components of clinical judgment were noted: noticing in 14/14; interpreting in 11/14; and responding in 8/14 journals. Further analysis yielded themes: media/social media misinformation can impact care that people seek; students recognize nursing responsibility to respond to misinformation; while most are able to recognize misinformation, many do not know how to respond.

Conclusions: Students recognized misinformation, but the degree to which they were prepared to respond to it is unclear. Further study is needed to determine the ability of prelicensure students to respond to misinformation and to determine if programs should evaluate for incorporation of misinformation into curricula.

Key Words: Misinformation, Curriculum development, Professional practice

1. BACKGROUND

The primary responsibility of nurse educators is to prepare students with the knowledge, skills, and attitudes necessary to enter professional clinical practice ready to face the realities and demands of the healthcare environment of today. In effectively educating students, this has shifted the expanse of nursing education over the years to include emphasis on cultural competence, incorporation of technology, emphasis and study of leadership theory and skills, and emphasis on public and global health, among many other topics and skillsets. One area that nursing education is not addressing

consistently or meaningfully, however, is that of healthcare misinformation. A paucity of information exists in the literature and in curricula related to addressing the nuances of misinformation with nursing students. If it is not being introduced, there is no way to assure competence in addressing misinformation with patients in professional practice. Rather, curricula should assess student competence in understanding what misinformation is, how to recognize it, and how to respond to it. The purpose of this study is to assess the student nurse's ability to recognize and respond to healthcare misinformation presented through the internet and media/social

*Correspondence: Terri W. Enslein; Email: ensleint@xavier.edu; Address: College of Nursing, Xavier University, Cincinnati, OH, USA.

media platforms.

1.1 Misinformation

The internet, social media outlets and applications, and changes to the overall media landscape have converged to revolutionize the accessibility of information to the world and have altered how information is utilized. A simple internet or social media search for “nursing” alone can yield literal millions of results in seconds or less. The ease with which information is accessed and shared allows for a global connectedness and the possibility of enhanced knowledge that has previously been unseen. This access to information does not come without a price, however, and may actually represent a significant global and public threat, particularly to healthcare and health-related decision-making.^[1-4] Much of the available information found online and on social media is false, opinion-based, inaccurate, incomplete, or even misrepresentation (whether intentional or unintentional), i.e. consists largely of misinformation. No one is immune to misinformation, and in fact, the elderly, children, and those with lower cognitive abilities are most susceptible to it.^[5]

The healthcare community and healthcare information are not exempt from misinformation, as a plethora of false, inaccurate, and misleading medical information exists on the internet and on social media.^[2,6,7] While the issue of misinformation is not new, the recent COVID-19 pandemic highlighted the potential impacts of misinformation on public health and safety for many.^[1,8] This vast mass of healthcare misinformation, referred to by the WHO as the great “infodemic”,^[9] has the potential to unleash disturbing effects on public health.

People continually and increasingly turn to the internet and social media as sources of both news and health information.^[2,8,10] Lewandowsky^[3] asserts that an estimated 61% of adults seek health information online, while Aharon^[1] further suggests that an estimated 55% of nurses do the same. The internet and social media resources have changed the way that all of us think about and engage with health. Swire-Thompson and Lazer^[11] suggest that the amount of health-related information available online makes it challenging even for the educated and knowledgeable to discern the difference between good and bad information.

1.2 Challenges

To respond appropriately, a better understanding of tactics for targeting misinformation is necessary. A multidisciplinary approach is most effective in highlighting the strategies that are proven and those that are unsuccessful in countering misinformation. Attempts to retract or counter misinformation are often unsuccessful for a variety of reasons. Simple re-

traction of the misinformation does not stop its continued influence, particularly when the act of isolating the misinformation often leads to skepticism and mistrust.^[2,6,12] Another complicating factor exists in that experiencers of the misinformation do not forget the inaccurate information simply because it has been retracted. Often, highlighting inaccurate information serves to further embed it. This “sticky” nature of misinformation makes it difficult to remove from memory, although supplying rationale for the correction can help.^[3] Cook et al.^[2] further suggest that the juxtaposition of misinformation with correct information highlights a gap in understanding. This gap, rather than acknowledged and processed by the user, is troublesome and often ignored in favor of easily retrieving an inaccuracy. This further serves to perpetuate the misinformation.

1.3 Successes

While efforts to refute misinformation are frequently ineffective, a variety of techniques have been identified to enhance the chances of successful refutation. Ritter et al.^[8] suggest that the focus of the refutation should be on the correct information, and not the misinformation. Providing a focus on evidence-based information, rather than falsehoods, highlights the information that should be perpetuated. Others contend that the factual alternative account should be both simple and brief, and occur in repetition to help the message stick.^[2,3,11,21] Social media and the internet can and should be utilized as platforms for dispersal of the corrected information. The public relies heavily on information gathered from social media and online, often even when the information is suspected of being false.^[10] These powerful platforms provide a holistic approach to correcting misinformation that can be viewed as a collaborative outreach by practitioners, offer further opportunity for enhanced dialog with and education of the public, and provide multiple opportunities for the spread of evidence-based health information.^[8,10,12-14] Cook et al.^[2] further assert that the use of social media for refutation of misinformation increases the effectiveness of the refutation. A final strategy in countering misinformation is the use of emotion and engagement. Many false narratives that spread online do so because of the emotional response that they evoke in the reader.^[7] Emotions, whether positive or negative, resonate more with readers than simple facts, and narratives that evoke emotion are more likely to be shared. Retractions and refutations of misinformation – while factual - should employ an emotional aspect to help engage the reader and perpetuate the narrative.^[13]

1.4 Responsibility

Organizations from the World Health Organization to the United Nations and beyond are seeking effective responses

to the issue, while encouraging healthcare workers to also respond. Many suggest that nurses, along with other healthcare professionals, are particularly poised to respond to healthcare misinformation individually and in concert.^[8,10,15,16] Nurses are armed with the knowledge and experience to counteract misinformation, are trusted sources of healthcare information, and at the same time are provided the best opportunities to respond to issues and concerns on the front lines and in the community. Others further suggest that nurses are not just encouraged, but are obligated to respond to misinformation as directives both of the profession itself and from accrediting bodies.^[12,17,18] Building upon this notion that nurses are obligated to respond to healthcare misinformation, nurse educators are equally responsible for educating pre-licensure students on the topic. Southwell^[18] suggests that education addressing encounters with misinformation is as critical a tactic in combatting misinformation as is its refutation. Further exploration of educational activities with this aim is needed.

2. METHODS

2.1 Design and sample

This article presents a qualitative case study aimed at evaluating prelicensure nursing student ability to recognize and respond to healthcare misinformation. The study presented participants with exposure to media – TV/movie birth scenes and birth-related podcasts – that are replete with healthcare misinformation. Participants, after taking in the media, were asked to then complete reflective journal entry responses. Design of the reflective journal prompts was guided by portions of Tanner’s Clinical Judgment Model (CJM). Participants were purposively sampled from the Spring semester OB/Peds course in a second-degree prelicensure nursing program.

All 14 students enrolled in the course elected to participate in the study. Participants were all second-degree students who possessed a minimum of a bachelor’s degree in an area outside of nursing prior to enrollment in the prelicensure nursing program. Participants ranged in age from 23 to 33. Of the 14 participants, three were men and 11 were women.

2.2 Instruments and data collection

Students enrolled in the course were tasked with choosing one of two different aesthetic learning activities: watch a TV/movie birth scene or listen to a birth-related podcast. All birth scenes and podcasts were pre-selected by the instructor for containing significant health-related misinformation and inaccuracy related to birth. Once the student completed viewing/listening to the birth scene or podcast, they were asked to complete a reflective journal entry based on the health-related information therein. This directed reflective

journal entry (see Appendix A) contained questions to help isolate presence of noticing, interpreting, and responding – all components of Tanner’s CJM.^[19] Students were tasked with completing this assignment as a required part of the course, whether they elected to participate in the study or not. The CJM design was selected as a guide for the reflective journal entry for two reasons. First, with the emphasis being on recognition and response to a particular phenomenon, the CJM was well-suited as a guide for reflection in this study. Tanner’s CJM is a guide for denoting how a nurse thinks and makes decisions based upon contextual clues and situations in practice, and is comprised of four key components: noticing, interpreting, responding, and reflecting in and reflecting on action (see Figure 1). Recognition and response – or noticing and responding – the two areas of focus in the study are two of the five CJM components. Second, inherent in preparedness for professional practice is the skill of clinical judgment. Nurses are tasked with significant decision-making routinely regarding patient care, and clinical judgment guides a nurse in the decision-making process. It is crucial to understand how a nurse thinks and makes decisions, to better teach and grow these skills.

2.3 Procedures and analysis

Qualitative data were collected from the reflective journal entries. These entries were submitted using the corresponding course learning management system (LMS). Once all students submitted the completed reflective journal to the LMS, a faculty member outside of the course graded them for completion. After grading, all identifying information was removed from the journal entries, and each was assigned a random identification number by this same faculty member to maintain confidentiality of participants. The journal entries were then given to the researcher for analysis.

Qualitative data analysis occurred in two phases beginning with magnitude coding of journal responses to assess for the presence of noticing, interpreting, and reflecting, followed by magnitude coding of identified recognition and responses. Then, a general review of the journal entries for emergent themes was completed via thematic coding.

Qualitative reliability was assured, to the extent possible, via several methods. First, the researcher ensured correct transcription of data from the original reflective responses to the database. Second, to avoid drift from data to codes, memos with codes and meaning were placed side-by-side with the data set during coding. In addition, the researcher maintained consistent methods across each reflective journal item, and across each journal entry. Validity of findings was more difficult to ensure, as triangulation was not an option with only one data source. The researcher did, however, fol-

low up with participants as a group at the conclusion of the study to validate whether emergent themes “felt” accurate to them. Feedback from participants in this regard were highly positive and congruent with researcher conclusions. In addition, the researcher made note of personal bias that may have impacted the study results in the limitations section. Generalizability of findings is more challenging, with the small sample size and case study nature of the qualitative study.

2.4 Approval and consent

All research presented herein was approved by the Xavier University Institutional Review Board (IRB# 21-457). Participants were recruited by a non-instructor faculty member. Prior to the presentation of the informed consent statement, the instructor of the course left the room. The approved in-

formed consent statement was read to eligible participants by the non-instructor faculty member. Paper consent forms were dispersed and then collected by the non-instructor faculty member. Both the statement and the consent form were approved by the Xavier University Institutional Review Board. The informed consent statements were not released until final grades were submitted for the course. Student data were deidentified before data analysis occurred.

3. RESULTS

3.1 Initial magnitude coding

Magnitude coding yielded evidence of all three highlighted components of Tanner’s Clinical Judgment Model in the reflective journal responses. Noticing was evident in all 14 reflective journals, interpreting in 11/14 journals., and responding in 8/14 reflective journals (see Figure 2).

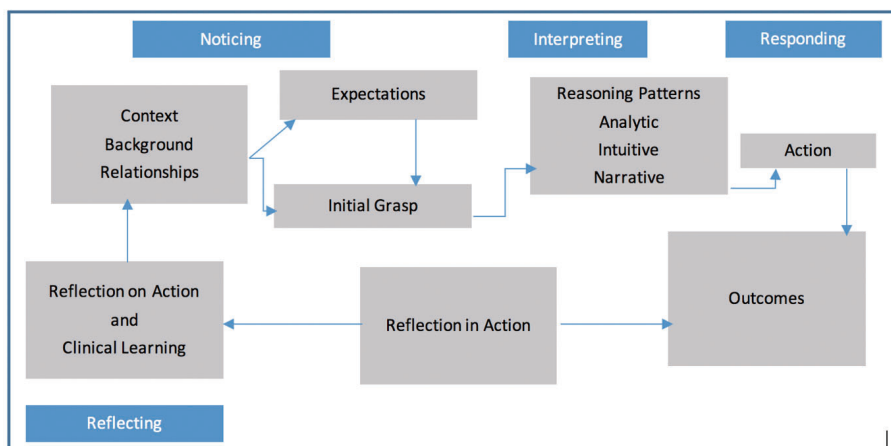


Figure 1. Tanner’s clinical judgment model

The visual depiction of the Clinical Judgment Model, as adapted from “Thinking like a nurse: A research-based model of clinical judgment in nursing” by C. Tanner, 2006, *Journal of Nursing Education*, p. 208.

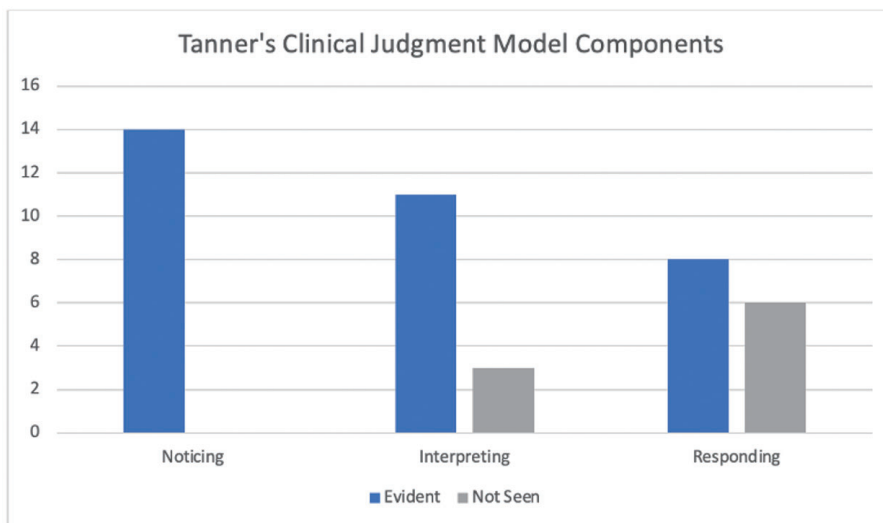


Figure 2. Evidence of Tanner’s model components

3.2 Thematic coding

Once thematic coding of reflective journals was completed, 3 distinct themes emerged: an impact on care-seeking; responsibility; and recognition but little effective response. Participants readily recognized the impact that misinformation could have on patients' expectations and care-seeking behaviors. This was evident in participant responses such as: "If the patient listens to and subscribes to the information presented in the episode, they would not be prepared for the actual labor process." Participant 1, MJ, F24

"Inaccurate portrayal of childbirth in TV and movies can impact the care patients seek or receive." Participant 13, TW, F24

"There is so much information accessible to people on the internet and on social media that is not necessarily fact-checked and can be entirely false or misleading. . . people may not understand the realities of complications of birth and this can discourage them from seeking proper care when they need it." Participant 9, AJ, F25

Secondarily in this same theme, participants noted that misinformation in tv/movies and podcasts can lead to mistrust of medicine/healthcare. This is demonstrated in the participant statement:

"The often inaccurate portrayals of childbirth and pregnancy care on podcasts and social media platforms definitely impact the care that patients seek today. The lack of media literacy in society allows radical views with a strong distrust of medicine to proliferate among vulnerable people searching for answers and a sense of belonging. Facebook groups are a great example of how people can join groups of like-minded people who tend to echo their own views and further radicalize their stance by justifying their distrust." Participant 4, CO, F27

The second theme noted was that of responsibility. Participants voiced that nurses have a responsibility to respond to healthcare misinformation. This was demonstrated well through the following participant statements:

"Ultimately it is the responsibility of the members of the healthcare community to inform the public of accurate health-related information." Participant 6, AK, F26

"All healthcare workers should be responsible for correcting or reporting misinformation in the media and all corrections they make should have significant supporting evidence and be entirely accurate." Participant 9, AJ, F25

The third theme that emerged was that while participants recognized that healthcare misinformation was present, they were able to offer little in the way of effective response to the misinformation beyond simple education. Recognition of misinformation was evident in participant responses such

as:

"There were some aspects of the birth scene that were accurate, but lots of it that were not and misleading." Participant 7, SP, F27

"This depiction was not accurate and there were many misrepresentations." Participant 8, KH, F26

"The depiction of birth was extremely misleading." Participant 10, MO, F24

"The information presented in the podcast was misleading at best and outright incorrect at worst." Participant 4, CO, F27

"This scene was very unrealistic of a normal, hospital birth." Participant 2, CD, M32

The lack of effective response beyond efforts to educate was noted throughout comments such as:

"Whether it is recommending childbirth and pregnancy classes to soon-to-be parents or educating patients on safe sleep, it is my job to pass on accurate information to individuals in need." Participant 11, LS, M27

"I think health care workers should focus a lot on education and expectations of what pregnancy and labor will look like for their patients throughout their visits to help mitigate misinformation." Participant 13, TW, F24

"I think to combat this misinformation, it is important for nurses and healthcare members to educate women on not only pregnancy and what to expect, but also prenatal care, the birthing process and the postpartum period." Participant 2, CD, M32

3.3 Secondary magnitude coding

Further magnitude coding was completed regarding recognition of misinformation and response to misinformation (see Figure 3). 12/14 participants recognized misinformation in the selected birth scene or podcast. All 14 participants mentioned education/communication as a means of combatting misinformation. While 4/14 participants suggested other means of combatting healthcare misinformation. Those that did offer alternative approaches in countering healthcare misinformation suggested: means of addressing the health literacy of the public; challenging the misinformation on social media with correct information; having medical staff work more closely with those in Hollywood to provide accurate info in the media; and improving overall health literacy.

4. DISCUSSION

Initial magnitude coding results for Tanner's Clinical Judgment Model components showed evidence of noticing, interpreting, and responding to the situation highlighted – exposure to healthcare misinformation. This suggests that this student group was largely able to both recognize and respond to misinformation. While there are further components of

Tanner’s Model that were not evaluated for through this activity, these components were recognized. This suggests

that learning activities regarding misinformation such as this have the potential to inform portions of the clinical judgment process, or may invoke use of clinical judgment processes.

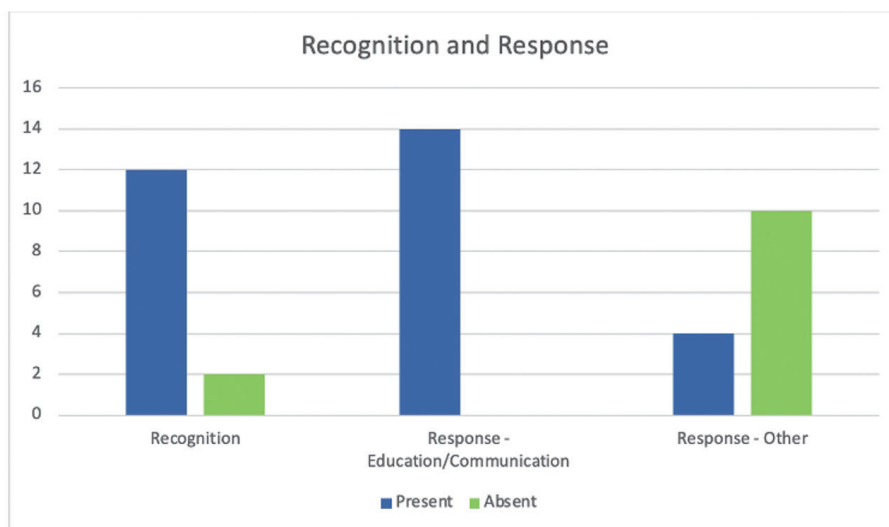


Figure 3. Recognition and response to misinformation

Thematic coding themes that emerged spoke to aspects of healthcare misinformation and its impact for the patient, an onus of responsibility for the nurse, and finally highlighted the lack of effective response on the part of the nurse. Much of this is demonstrated in the literature as well. In terms of patient outcomes, there is clear support that misinformation can impact healthcare decision making and can foster a distrust of medicine/healthcare.^[2,3,18,20] Further, in the second theme that emerged through analysis of the journals, nursing’s responsibility to counter misinformation, there is also significant support noted in the literature mirroring the study findings.^[8,12,17] Finally, while participants largely recognized the healthcare misinformation present in the activity (12/14 identified misinformation), only four of the 14 were able to suggest a meaningful response to counter misinformation beyond simply educating the patient. This was seen in both the final emergent theme resulting from the thematic coding as well as in the secondary magnitude coding performed. This suggests that while students are able to recognize misinformation, and able to understand that a response is necessary, they are not equipped to offer much in the way of intervention beyond the need to educate the patient. The literature suggests that, in fact, factual countering of misinformation with correct information is key, but must be done in a specific manner to be effective. This information should be simple and brief, should occur with repetition, should utilize a social media and/or internet platform, and should employ emotional engagement in order to be successful.^[2,3,7,8,10-14]

Taken in aggregate, these findings suggest that the participants were able to both recognize and respond to misinformation when presented with it, but the degree to which they were able to respond is not well understood. The study findings were informally affirmed by the participants at the conclusion of the study, in a conversation reviewing overarching the themes. Further study is needed to determine the generalizability of the findings and to determine the impact of such activities, if any, on preparedness for professional practice.

Limitations

Limitations were identified within the study, particularly the sample size itself. Threats to validity of findings - including small exposure time to the variable of healthcare misinformation, lack of external auditing, and potential researcher bias – also provided limitations. Finally, the placement of the study in a second-degree pre-licensure program could have significantly impacted generalizability of findings. In general, second-degree students already possess a non-nursing bachelor’s degree, are somewhat older, and often display more leadership abilities. It would be beneficial in future study to compare the findings to those of traditional pre-licensure nursing students.

5. CONCLUSIONS

Nurse educators are tasked with preparing students with the knowledge, skills, and attitudes necessary to contend with the realities of professional practice today. The internet

and social media outlets have revolutionized the availability of healthcare information today. Patients are increasingly seeking health-related information from these sources, and presenting to healthcare providers armed with misinformation and altered understanding and expectations. Nurses have a professional responsibility to respond to and counter this misinformation. As such, nurse educators must provide opportunities for students to become familiar with misinformation, recognize it, and learn about appropriate and effective response to it to prepare them for professional practice. Further study is needed both to determine whether students are prepared for encountering healthcare misinformation in practice, and to determine when and if education incorporating learning activities about it in prelicensure programs is needed. Further study is also needed on the impacts of misinformation education for pre-licensure nursing students, including traditional students, and on effective methods of delivery.

ACKNOWLEDGEMENTS

NA

AUTHORS CONTRIBUTIONS

NA

FUNDING

NA

CONFLICTS OF INTEREST DISCLOSURE

The author declares that they have no known competing financial interests or personal relationships that could have

appeared to influence the work reported in this paper.

INFORMED CONSENT

Obtained.

ETHICS APPROVAL

The Publication Ethics Committee of the Sciedu Press. The journal's policies adhere to the Core Practices established by the Committee on Publication Ethics (COPE).

PROVENANCE AND PEER REVIEW

Not commissioned; externally double-blind peer reviewed.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

DATA SHARING STATEMENT

No additional data are available.

OPEN ACCESS

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).

COPYRIGHTS

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

REFERENCES

- [1] Amit Aharon A, Ruban A, Dubovi I. Knowledge and information credibility evaluation strategies regarding COVID-19: A cross-sectional study. *Nursing Outlook*. 2021; 69(1): 22–31. PMID:34756383 <https://doi.org/10.1016/j.outlook.2020.09.001>
- [2] Cook J, Ecker U, Lewandowsky S. Misinformation and how to correct it. *Emerging Trends in the Social and Behavioral Sciences: An Interdisciplinary, Searchable, and Linkable Resource*. 2015; 1–17. <https://doi.org/10.1002/9781118900772.etrds0022>
- [3] Lewandowsky S, Ecker UKH, Seifert CM, et al. Misinformation and Its Correction: Continued Influence and Successful Debiasing. *Psychological Science in the Public Interest*. 2012; 13(3): 106–131. PMID:26173286 <https://doi.org/10.1177/1529100612451018>
- [4] Shao C, Hui PM, Wang L, et al. Anatomy of an online misinformation network. *PLOS ONE*. 2018; 13(4): e0196087. PMID:29702657 <https://doi.org/10.1371/journal.pone.0196087>
- [5] Frenda SJ, Nichols RM, Loftus EF. Current Issues and Advances in Misinformation Research. *Current Directions in Psychological Science*. 2011; 20(1): 20–23. <https://doi.org/10.1177/0963721410396620>
- [6] Chou WYS, Oh A, Klein WMP. Addressing Health-Related Misinformation on Social Media. *JAMA*. 2018a; 320(23): 2417–2418. PMID:30428002 <https://doi.org/10.1001/jama.2018.16865>
- [7] West JD, Bergstrom CT. Misinformation in and about science. *Proceedings of the National Academy of Sciences*. 2021; 118(15). PMID:33837146 <https://doi.org/10.1073/pnas.1912444117>
- [8] Ritter AZ, Aronowitz S, Leininger L, et al. Dear Pandemic: Nurses as key partners in fighting the COVID-19 infodemic. *Public Health Nursing*. 2021; 38(4): 603–609. PMID:33876450 <https://doi.org/10.1111/phn.12903>
- [9] World Health Organization. Infodemic management. WHO. 2020. Available from: <https://www.who.int/teams/risk-communication/infodemic-management>
- [10] Snyder K, Pelster AK, Dinkel D. Healthy eating and physical activity among breastfeeding women: The role of misinformation.

- BMC Pregnancy & Childbirth. 2020; 20(1). PMID:32807126 <https://doi.org/10.1186/s12884-020-03153-x>
- [11] Swire-Thompson B, Lazer D. Public Health and Online Misinformation: Challenges and Recommendations. *Annual Review of Public Health*. 2020; 41: 433–451. PMID:31874069 <https://doi.org/10.1146/annurev-publhealth-040119-094127>
- [12] Zuzelo PR. Holistic Considerations of Misinformation and Mandates in the Pandemic Era. *Holistic Nursing Practice*. 2021; 35(6): 347–349. PMID:34647917 <https://doi.org/10.1097/HNP.0000000000000485>
- [13] Jones M, James J. Role of the nurse in addressing vaccine hesitancy and misinformation on social media. *Nursing Standard*. 2021. Available from: <http://eprints.bournemouth.ac.uk/36126/>
- [14] Siegmund LA. “Like Us on Facebook®”: Nursing in a World of Social Media. *Journal of Radiology Nursing*. 2019; 38(3): 183–187. <https://doi.org/10.1016/j.jradnu.2019.06.003>
- [15] Choi KR, Skrine Jeffers K, Cynthia Logsdon M. Nursing and the novel coronavirus: Risks and responsibilities in a global outbreak. *Journal of Advanced Nursing* (John Wiley & Sons, Inc.). 2020; 76(7): 1486–1487. PMID:32202336 <https://doi.org/10.1111/jan.14369>
- [16] Grace PJ. Nurses Spreading Misinformation. *AJN, American Journal of Nursing*. 2021; 121(12): 49–53. PMID:34792505 <https://doi.org/10.1097/01.NAJ.0000803200.65113.fd>
- [17] Bondmass MD. What is a Nurse’s Ethical Obligation Regarding COVID-19 Vaccines and Misinformation? *Nevada RNformation*. 2021; 31(1): 1–3.
- [18] Southwell BG, Niederdeppe J, Cappella JN, et al. Misinformation as a Misunderstood Challenge to Public Health. *American Journal of Preventive Medicine*. 2019; 57(2): 282–285. PMID:31248741 <https://doi.org/10.1016/j.amepre.2019.03.009>
- [19] Tanner CA. Thinking Like a Nurse: A Research-Based Model of Clinical Judgment in Nursing. *Journal of Nursing Education*. 2006; 45(6). PMID:16780008 <https://doi.org/10.3928/01484834-20060601-04>
- [20] Chou WYS, Oh A, Klein WMP. Addressing Health-Related Misinformation on Social Media. *JAMA*. 2018b; 320(23): 2417–2418. PMID:30428002 <https://doi.org/10.1001/jama.2018.16865>
- [21] Lewandowsky S, Cook J, Schmid P, et al. The COVID-19 Vaccine Communication Handbook. A practical guide for improving vaccine communication and fighting misinformation. *SciBeh*. <https://sks.to/c19vax>