Research Brief: A Class-Based SoTL Investigation of Senior Nursing Student Perceptions, Beliefs, and Behaviours Regarding Health Misinformation and Science Skepticism

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Abstract

Rising misinformation and decreasing trust in science are currently a threat to public health and well-being. Nurses, and other health care professionals, have an obligation both to be able to inform themselves, evaluate information, and to be able to engage with patients, families, and communities to counter this. To prepare nursing students to do this, we (a nursing instructor and a librarian) designed and introduced a three-hour class on the topic. For this scholarship of teaching and learning study, we utilized a pre- and post-survey to assess students' perceptions, beliefs, and behaviours related to their personal efficacy with electronic health literacy, their attitudes and beliefs about science, and their information/misinformation sharing practices. Statistical results of the study found minimal statistical difference pre- and post- class, but the individual item analysis and overall results provided rich content for reflection on student learning and teaching.

Keywords: nursing students, eHealth literacy, health misinformation, science skepticism

Background

The pervasiveness of online health misinformation, compounded by a growing mistrust in science (Hotez, 2020), is having a detrimental impact on public health (Morgan et al., 2018; Early et al., 2022; Krishna & Thompson, 2021; Peter, 2025). Nurses have an ethical obligation to address and correct health misinformation (Charles & Grace, 2025; Peter, 2025), yet they can also struggle to identify such misinformation and have been notably complicit in spreading it through social media (Charles & Grace, 2025). Nursing graduates must be adequately prepared to both practice within this ever-evolving online information context and actively engage in countering the rising prevalence of misinformation and science mistrust (Espina & Spracklin, 2022; Peter, 2025).

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Given the real consequences of health misinformation and science skepticism on public health and health behaviours, particularly in relation to vaccines (Hotez, 2020; Peter 2025), it is essential that these topics are critically examined in nursing curricula. Nursing students must develop assessment strategies for avoiding and countering misinformation (Pickler, 2024). Yet post-secondary students often lack the critical evaluation skills necessary to consistently differentiate between the reliable, evidence-based health information and the inaccurate or misleading information they find online (Tubaishat & Habiballah, 2016; Early et al., 2022; Espina & Spracklin, 2022). Typical source evaluation strategies or quality indicators such as peer-review do not translate well in the unregulated online information environment (Espina & Spracklin, 2022; Bull et al., 2021). New teaching approaches are needed to equip nursing students with knowledge of online information ecosystems, bring critical self-awareness of their own biases and susceptibilities, and take an investigative, fact-checking approach to assessment (Early et al., 2022; Espina & Spracklin, 2022; Bull et al., 2021).

In response to this perceived need within nursing curricula, we, a nursing course instructor and librarian, collaboratively developed a three-hour health misinformation class as part of a fourth-year Winter 2025 course. We used a systems-thinking approach, examining historic patterns, antecedents, underlying algorithms, and social positionality, alongside effective investigative and avoidance strategies. Students actively engaged in this learning through readings, self-reflection, group discussion, and hands-on practice with different tools and models.

Curious about the preconceived understandings, attitudes, and beliefs of students and what impacts this learning might have, we designed a small-scale SoTL study alongside class development. As SoTL scholars, we ascribe to Hutchings' (2010) notion that "teaching, like learning, is intellectual work, work that can be improved through systematic inquiry, critique, and collaboration within a diverse community of learners, be they teachers or students; indeed, it strives to make better learners of both" (p. 70). Our desire to understand student preconceptions pertaining to health misinformation and science skepticism address these important curricular concepts and equip future nurses to respond to these societal threats, falling within the societal domain of SoTL scholarship (Booth & Woollacot, 2017). By employing a survey to investigate possible impacts of classroom learning on students' understanding, attitudes, or beliefs, our study is also situated within the didactic domain of SoTL scholarship, which aims to examine teaching and learning practices (Booth & Woollacot, 2017). Our research questions were: 1) What is the baseline understanding of student-perceived online health literacy, beliefs about science, and misinformation attitudes and behaviour? and 2) What differences (if any) were found among these perceptions, attitudes, or beliefs following class learning?

Methods

Our study employed a pre-/post-intervention survey with a convenience sample of fourth-year nursing students enrolled in the senior elective course. Ethical approval was obtained. One week prior to the misinformation class, the librarian provided study information and the pre-survey link. Immediately following the misinformation lesson, the librarian reviewed study

information and provided the post-survey link. Students were informed that participation was entirely voluntary and would not impact academic standing. Consent was obtained as an indicator on each survey. Class time was allocated for completion in both cases, and the course instructor was absent from the classroom. To ensure anonymity, no demographic or identifying information was collected; participant-generated code was used to match pre- and post- survey responses.

The Google Form surveys employed open-ended questions and Likert-style questions drawn from three validated tools: eHEALS, measuring self-perceived eHealth Literacy (Norman & Skinner, 2006), the Negative Perception of Science Scale (Morgan et al., 2018), and Misinformation and Sharing of Misinformation scale (Kahn & Idris, 2019).

Analysis

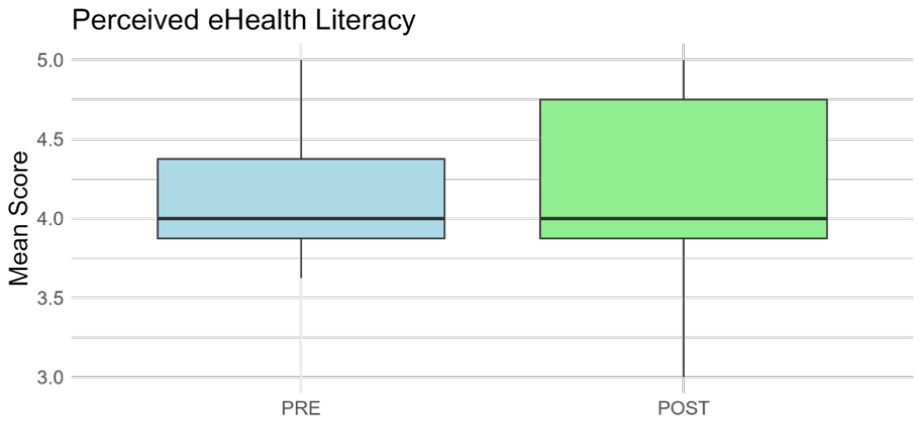
Results included 24 pre-survey responses, with 13 participants completing both the pre- and post-surveys. Lower attendance affected post-response rate. Statistical analysis was completed by the statistician/faculty author on this paper.

Findings

eHealth Literacy Scale (eHEALS)

The eHEALS tool is an 8-item tool that measures participants' perceived self-efficacy with finding, evaluating, and applying electronic health information (Norman & Skinner, 2006). Mean eHEALS response scores were 4.0 out of 5.0 in both pre-survey and post-survey (Figure 1), indicating a moderate level of self-efficacy. Statistical analysis found no statistically significant change(s) post-class.

Figure 1. eHEALS response data



Negative Perception of Science Scale

The Negative Perception of Science Scale (NPSS) is a validated, multi-dimensional instrument, measuring respondent perceptions of science (Morgan et al., 2018). Our study included the following components: Science as Onerus (Figure 2.1), Science as Corrupt (Figure 2.2), and Science as Limited (Figure 2.3).

Baseline responses revealed considerable variability in personal perceptions across items. Descriptive statistics represented a rise from the pre-survey responses (n-24). With one exception, each question elicited responses across the spectrum, including various levels of Agree, Neutral, and Disagree, with limited homogeneity of results. Under the dimension Science as Corrupt (Figure 2.2), the statement, *Scientists are often dishonest about their research findings*, elicited only Neutral (47.8 % of responses), Disagree (47.8 % of responses), and Strongly Disagree (4.3 % of responses).

For Figures 2.1, 2.2, and 2.3, pink represents “Agree,” with lighter pink representing “Strongly Agree,” gray represents “Neutral,” and darker blue represents “Disagree,” with lighter blue representing “Strongly Disagree.” Statistical analysis found no statistically significant changes pre-/post-survey.

Figure 2.1. Perception of science as onerous

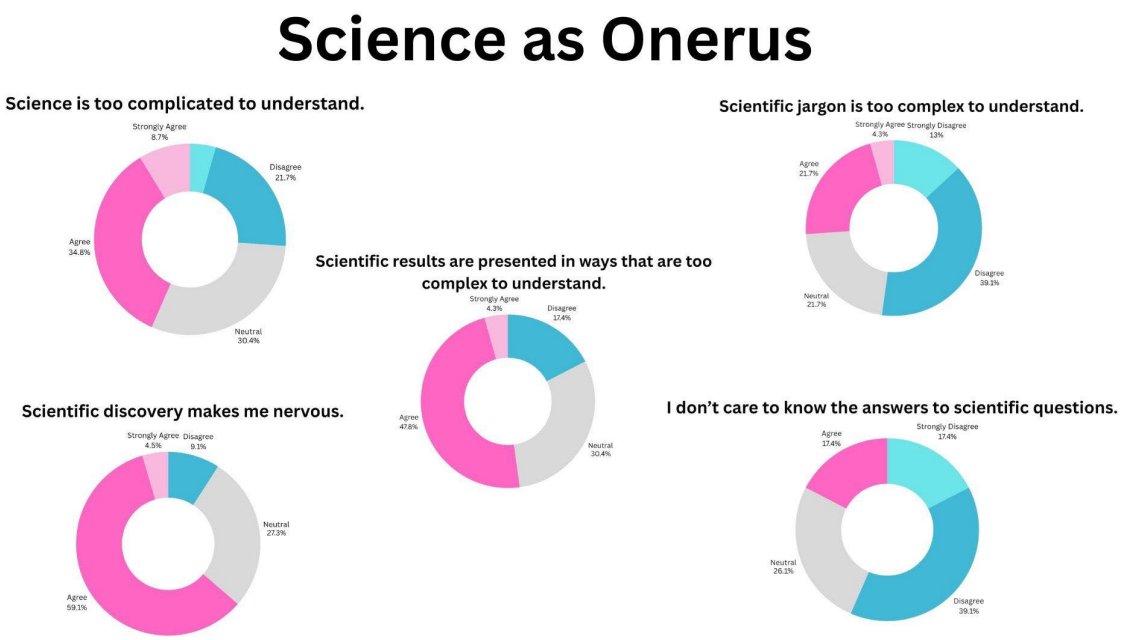


Figure 2.2. Perception of science as corrupt

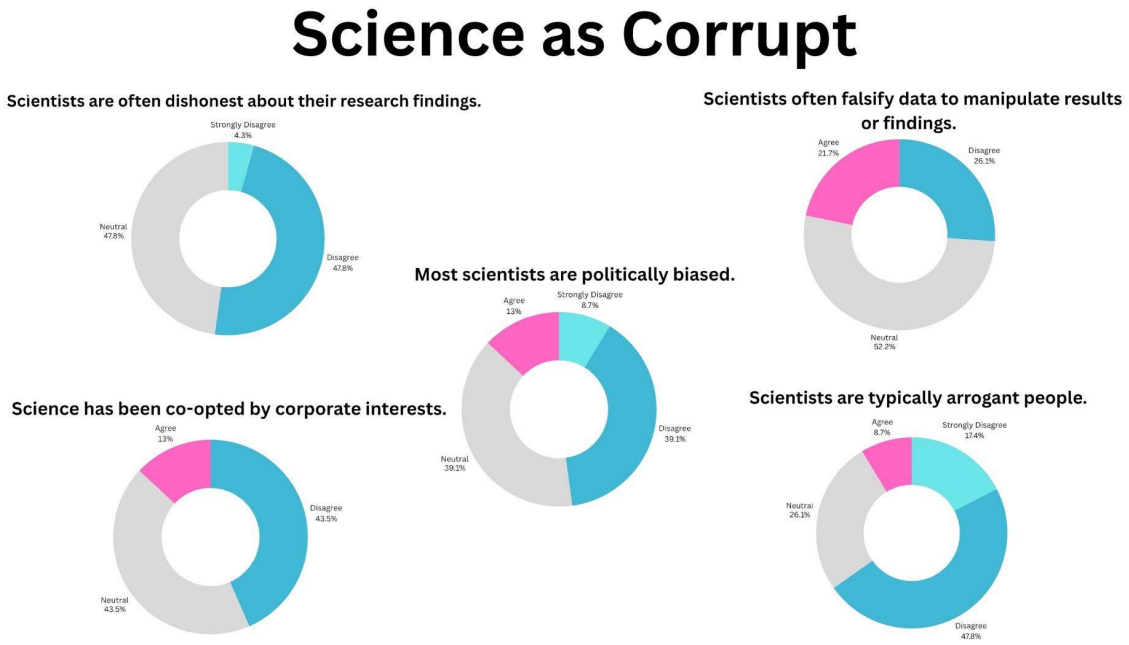
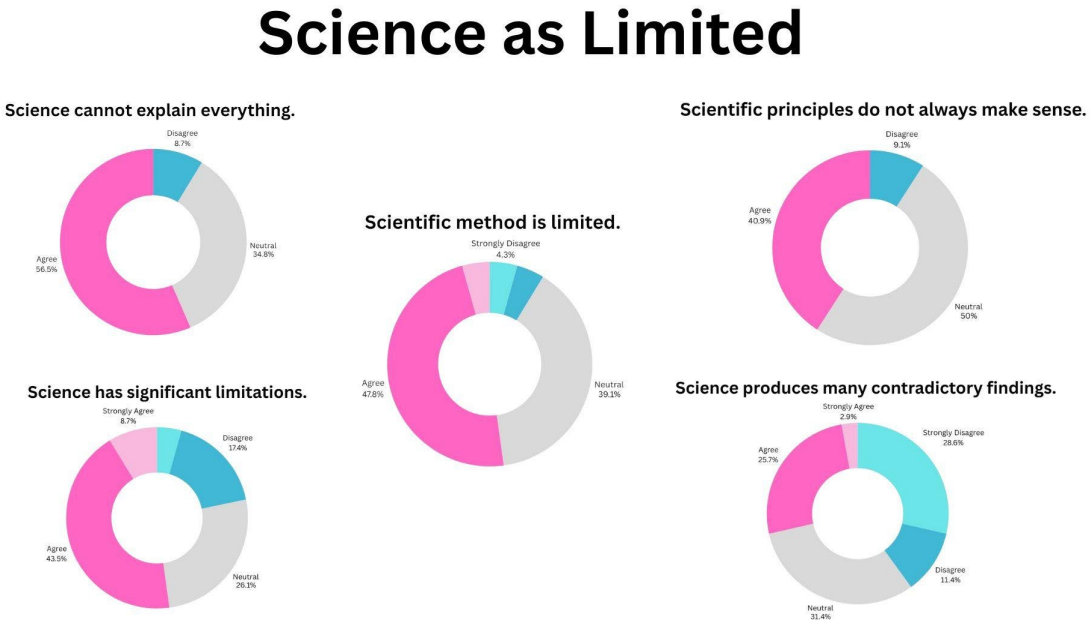


Figure 2.3. Perception of science as limited



Misinformation Belief and Sharing of Misinformation

The Misinformation Belief and Sharing of Misinformation questions measure respondents' beliefs about the reliability of information, attitudes towards verifying online information, self-efficacy in identifying misinformation, and behaviour of sharing without verifying (Kahn & Idris, 2019).

Figures 3.1–3.4 show changes in mean item scores across these four domains. Statistical analysis (Paired t-test) demonstrated a marginally significant difference for self-efficacy in recognizing misinformation (p-value=0.0976, Figure 3.3) and behaviours of sharing without verification (p-value=0.0976, Figure 3.4), with no statistically significant results for the first two domains.

Figure 3.1. Belief in reliability of information - Changes in mean item scores

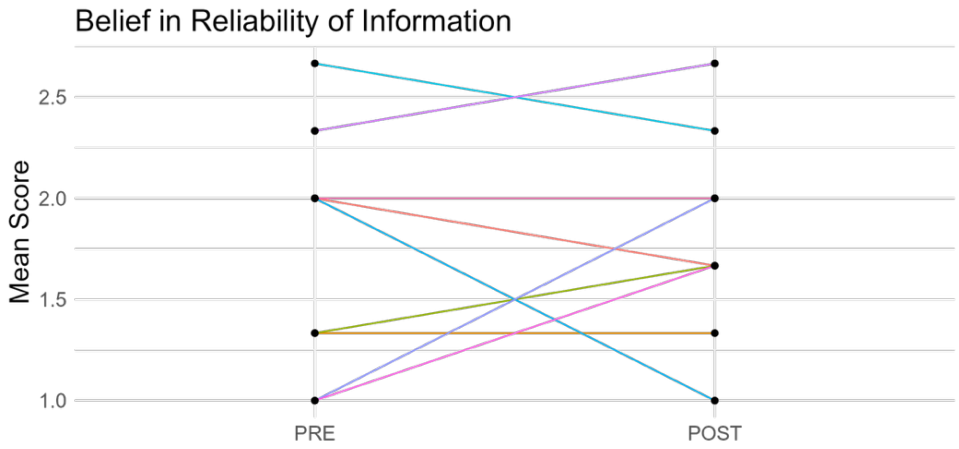


Figure 3.2. Attitudes towards verifying information - Changes in mean item scores

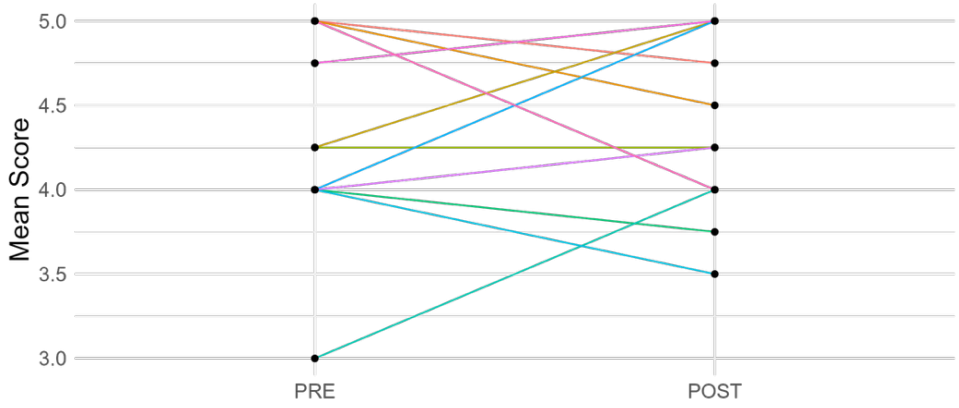


Figure 3.3. Perceived self-efficacy in recognizing misinformation - Changes in mean item scores

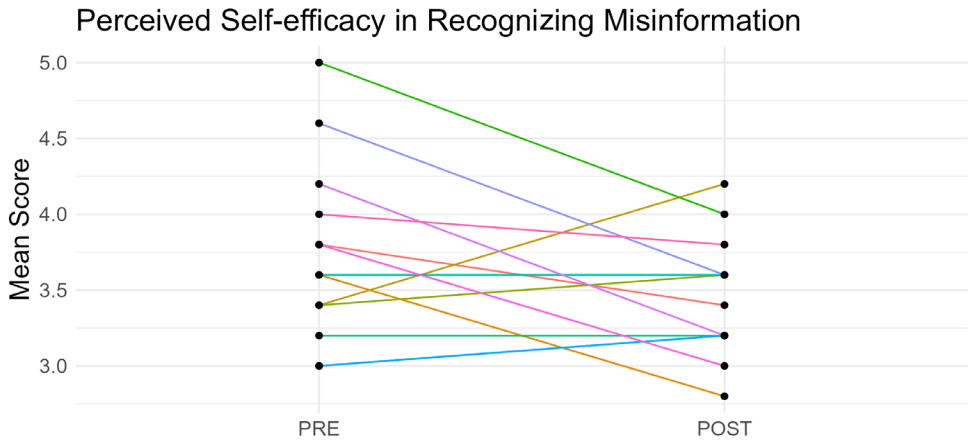
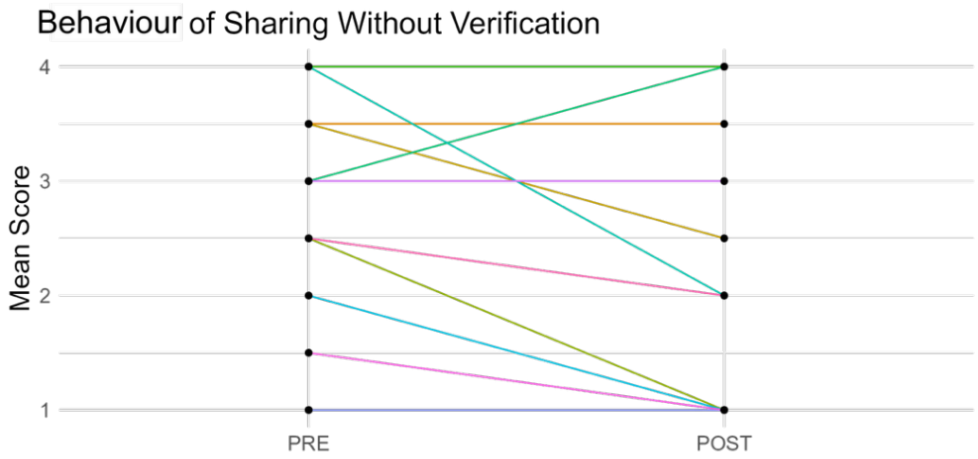


Figure 3.4. Behaviour of sharing without verification - Changes in mean item scores



Discussion

This small SoTL study systematically examined our students' perceptions and beliefs regarding eHealth literacy, misinformation, and science. Insights gained will inform our personal instructional practices and course design. While limitations preclude generalization, the findings provide some useful considerations that educators in other contexts might consider.

Our eHEALS median score of 4.0 (Figure 1) is higher than that found in previously published, larger-scale studies (Tubaishat & Habiballah, 2016; Early et al., 2022). While acknowledging student tendencies towards overconfidence in self-reporting online literacy abilities (Early et al., 2022), this finding does indicate a level of comfort. The marginally

significant changes post-class across two misinformation scale domains suggest possible impact on student perceptions. We observed correlations between the slightly lower perceived self-efficacy scores for misinformation recognition (Figure 3.3), and post-survey, open-ended responses, such as "*a bit more awareness towards my own actions and limitations when faced with misinformation.*" Pairing the two, we can speculate that reductions in perceived self-efficacy may result from class learnings about underlying antecedents and ecosystems that facilitate pervasive and persuasive misinformation spread. Our second finding, that of slightly lower scores relating to sharing without verification (Figure 3.4), hints at learning that could play a positive role in curbing the spread of misinformation.

The anti-science scale responses were thought-provoking, despite the lack of any statistically significant changes. Descriptive statistics demonstrated a broad range of student responses to the anti-science questions, with some students holding hesitant or anti-science attitudes. Additionally, 43.5% of the fourth-year nursing student-respondents reported believing that "science is too complex to understand" (Figure 2.1). These results align with the literature, that regardless of curricular exposure to scientific studies, nurses are not immune to having their trust in reputable science shaken (Grace, 2021). These results were disorienting, sparking speculation and reflection about our teaching strategies and practices, and prompting us to consider: *How can we help ensure all students are understanding scientific articles as required? How might we build these baseline competencies without compromising the learning experience of those with stronger scientific foundations?* These speculations on one item of the anti-science scale are illustrative of our examination of the other items and of reflections that will inform our teaching practices. We encourage other nursing educators to consider similar questions within their own context, given that their students are also susceptible to the anti-science beliefs impacting society on a larger scale (Phillip-Muller et al., 2022).

Beyond baseline understandings of student preconceptions, our secondary aim was to discover possible impacts of class learning on student perceptions or beliefs. With no statistically significant changes pre-/post- class, and only marginally significant differences for the two misinformation subcategories discussed above, we have no solid empirical evidence of class-learning impact on student eHealth literacy, science beliefs, or misinformation perceptions. We acknowledge that our surveys relied on self-report measures, which, while commonly used when examining affective experiences, have known limitations and can produce unreliable findings (Teoh et al., 2023). We also understand that the impact of the specific class studied extends beyond measurable changes in student perceptions or beliefs, neither of which are a complete representation of the effectiveness of the class as whole or the fulsome learning experiences of students. Anecdotally, the course instructor witnessed the application of learning later in the course when students were engaged in a small-group case study exercise. The case study involved an elderly patient who, guided by misinformation, was pursuing an alternate medical treatment unsupported by scientific evidence. With knowledge and compassion, students identified strategies for effectively engaging with the case study patient about their health choices, beliefs, and misinformation.

While there is some debate regarding the significance of the threat misinformation poses, scholars warn it must be taken seriously (Ecker et al., 2024). Health misinformation can have profound impacts; if nurses have a moral imperative to address misinformation (Charles & Grace, 2025; Peter, 2025), educators have an obligation to develop these understandings, literacies, and skills. In our study, 100% of post-survey respondents indicated that it is "important" (23%) or "extremely important" (77%) that health professionals such as nurses are able to assist patients with misinformation mitigation strategies. These responses reinforce our belief in the value of this learning and should offer confirmation to other health educators that these concepts warrant attention in their teaching, classrooms, and curricula.

Given the small convenience sample and our framing of understanding learning-in-context, results were not intended to be generalizable to other contexts. However, our findings and observations can encourage educators to consider the diversity of perceptions, beliefs, and behaviours of their own students with regard to health misinformation and science mistrust. Considering ourselves as learners, engaging in systematic study of other learners and learning (Hutchings, 2010) has allowed us to discover findings that inspire our curiosity as teachers and provoke contemplation, consideration, and understanding that will inform our teaching practices. While these findings may not be generalizable, they may inspire curiosity for other educators to consider how the prevalence of misinformation and mistrust in science may be impacting learners in their contexts and how this knowledge might inform their pedagogical practices.

Conclusions

With the ethical and practical obligation of nursing graduates to be ready to confront health misinformation and reorient misaligned science skepticism (Charles & Grace, 2025; Peter, 2025; Pickler, 2024), addressing these concepts in our nursing curriculum is crucial, and more research is warranted. Given the diverse array of beliefs and attitudes of our nursing students regarding science itself, a large-scale exploratory study on this matter would be a good first step. Our study results suggest that it is essential for educators to question assumptions they may have about students' biases and beliefs, particularly regarding science, and to help their students to do the same.

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