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Gender differences in the expression and cognition of empathy among nursing students: An educational assessment study

Yulia A. Strekalova[a,*], Sining Kong[a], A.J. Kleinheksel[b], Adam Gerstenfeld[a]

[a] College of Journalism and Communications, University of Florida, Gainesville, FL, USA
[b] Medical College of Georgia, Augusta University, Augusta, GA, USA

A B S T R A C T

Background: In the medical context, previous studies found that female care providers present more empathy with patients than their male counterparts. Yet, the explanatory mechanisms for such a difference are not fully explored.
Purpose: Guided by the message design logics, this study looked to assess the differences in the expression of empathy by male and female nursing students.
Methods: The data included transcripts of conversations between 343 undergraduate nursing students and a virtual patient.
Results: Study hypothesis, which was supported, predicted that when presented with opportunities to express empathy female students will use such opportunities more frequently than male students. RQ1 assessed the level of empathic responses and showed no differences between male and female students. RQ2 focused on the cognitive models of empathy and showed that female students had more complex maps that included a larger number and levels of empathy-related concepts.
Clinical relevance: While both male and female students could benefit from education and support in effective expression of empathy, tailored education could promote the recognition of opportunities to be empathic among male students. Clinical communication skill training programs should consider gender-sensitive interventions to support and promote male nurse empathy skills.

1. Introduction

Empathy involves the ability to emotionally respond to the feelings of others, understand emotive and cognitive states of others, and communicate those reactions to others (Brunero et al., 2010; Preston and De Waal, 2002). As a multidimensional construct, empathy can be conceptualized through the duality of affective and cognitive connection between two people (Shamay-Tsoory et al., 2009). Affective empathy reflects the ability to share emotions, and vicariously experience feeling the same emotion as another person, and the express compassion (Caravita et al., 2009; Coke et al., 1978; Feshbach and Roe, 1968; Stotland, 1969). Affective empathy is considered as a primal response that emphasizes the ability to react appropriately to others' affective states (Ford, 1979; Underwood and Moore, 1982).

Cognitive empathy, on the other hand, refers to the ability to understand the breadth of experience of another person (Kohler, 1929). Cognitive empathy is the conscious process that focuses on understanding others' feelings (Kohler, 1929), which is also referred to as "cognitive role taking" (Ford, 1979; Mead, 1934; Shantz, 1975; Underwood and Moore, 1982). Cognitive empathy manifests in the deliberate consideration of the situational factors, rules, and norms experienced by others (Krebs, 2008). The theory of mind (Astington et al., 1990; Bzdok et al., 2012; Wellman, 1990) explains empathic response as the ability to contemplate other's thoughts, desires, and behavioral dispositions by abstract inference as well as infer others' mental state by isolating one's own current perspective (Leslie, 1987). Therefore, cognitive empathy can promote social functioning by helping people understand others and predict others' behaviors (Smith, 2006). Thus, cognitive empathy is characterized by social cognition, perspective taking, and situational understanding of a mental model of another person (Bernhardt and Singer, 2012; Fan et al., 2011). Given the features of affective and cognitive empathy, affective empathy can be considered as a spontaneous response, whereas cognitive empathy involves more systematic deliberation and processing (Hodges and Wegner, 1997), which suggests that the latter, cognitive empathy, could be taught and evaluated as a professional skill.

Given the cognitive and affective dimensions of empathy, in this study, empathic response is defined as a cognitive understanding of patients' situations, and an affective expression of concern and care for patients. The goal of this paper is to report on an effort to assess empathy communication skills among nursing students. More specifically, although there is ample research that examined the individual differences in empathy expression, few studies focused on how female and male nurses differ in their empathic responses. This paper aims to narrow this research gap by examining the differences between male and female nurses in identifying and acting on the opportunities for

* Corresponding author at: Division of Graduate Studies and Research, College of Journalism and Communications, University of Florida, 2016 Weimer Hall, Gainesville, FL 32510, USA.
E-mail address: yulias@ufl.edu (Y.A. Strekalova).

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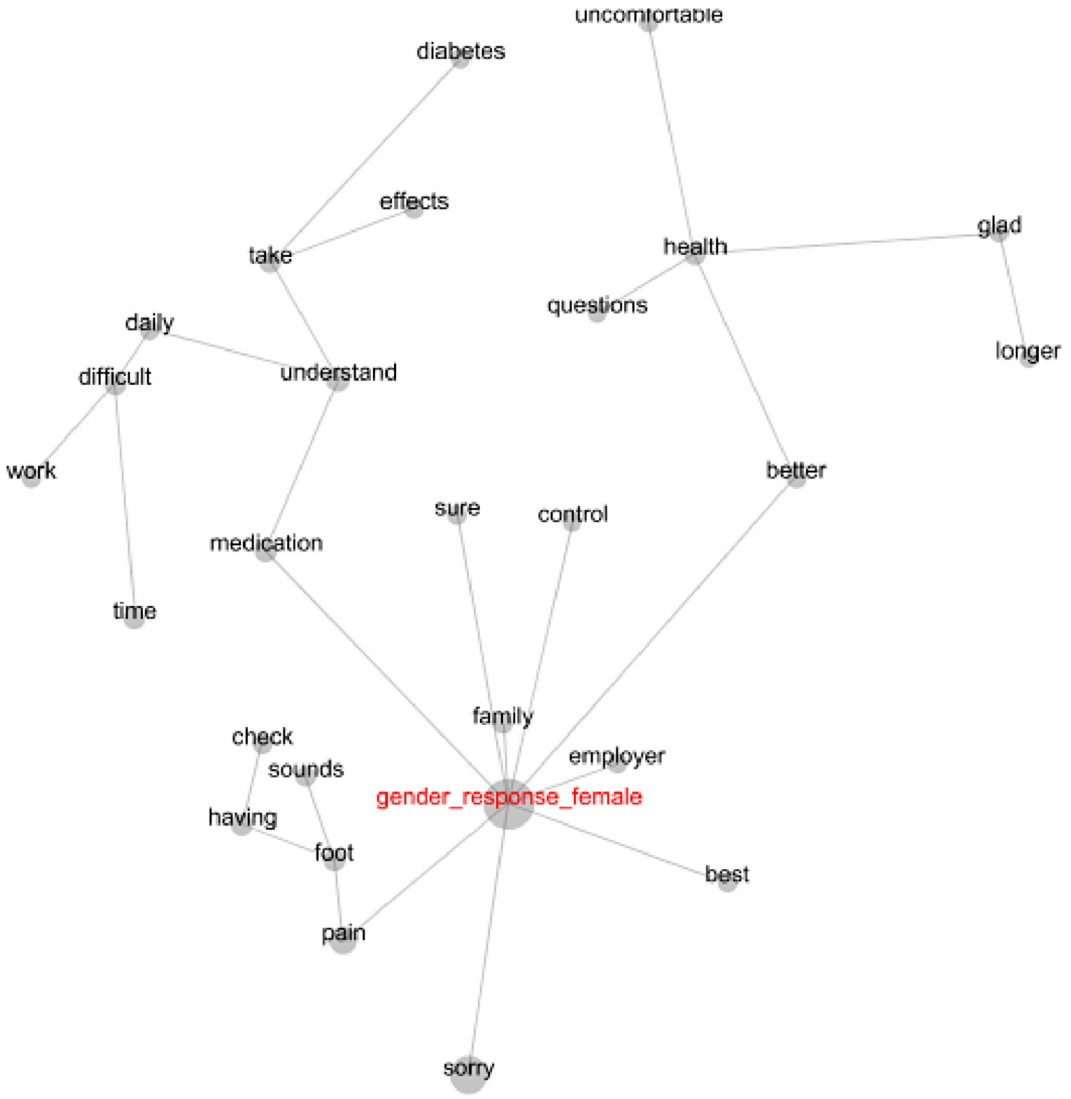

Fig. 1. Collective cognitive map of empathy expressed by female nursing students.

empathic response.

2. Literature review

2.1. Empathy in nurse-patient communication

Empathy has received attention in previous research, and has been evaluated from the perspective of a core to human interaction (Baron-Cohen and Wheelwright, 2004), communication efficacy to express empathy (Strekalova et al., 2017a), and a critical element in relationship between nurses and patients (Ozcan et al., 2010). Most commonly, conceptualization of empathy suggests grouping it into two categories: affective empathy and cognitive empathy.

Communication plays a key role in establishing high-quality nurse-patient relationship, and promotes patients' satisfaction and cooperation with medical teams. As the nurse-patient relationship depends on the communication of a nurse's knowledge and understanding of patients, empathy is considered as the most valuable skills of the nurses (McCarthy and Aquino-Russell, 2009). Empathy is an integral part of nurse-patient communication, and can be learned and developed through education (Kalisch, 1971; Ozcan et al., 2010; Reynolds et al., 1999). As a personal quality, empathy varies across individuals (Hojat et al., 2002a, 2002b).

When it comes to nurse-patient relationship, both affective and cognitive empathy are desired. Nurses' affective empathy refers to their expression of caring and concern of the patients (Hojat et al., 2002a, 2002b), while nurses' cognitive empathy reflects their professional skills to understand what causes patients' discomfort (Ward et al., 2012). These two types of empathic responses reflect a nurse's degree of understanding patients' plight and feelings. Therefore, the empathic communication is essential in nurse-patient relationship.

2.2. Empathic communication efficacy

Deliberate expression of empathy is a rational communication goal (Brown and Levinson, 1978), and appropriate linguistic strategies and communication logic are cornerstones to achieve this goal. O'Keefe (1988) suggested to use message logic to help people formulate suitable messages. There are three types of message logic: expressive, conventional, and rhetorical.

Expressive logic is considered the simplest and is formed by directly expressing one's thoughts and feelings. Under this logic, messages are considered as an expression to let others know what the speaker thinks and feels. The use of expressive logic emphasizes the expression of speaker's thoughts and feelings with an expectation that others will understand those thoughts and feelings. A cognitive empathic response of the speaker who uses expressive logic shows ignorance of the contextual factors and failure to experience vicariously the feelings of

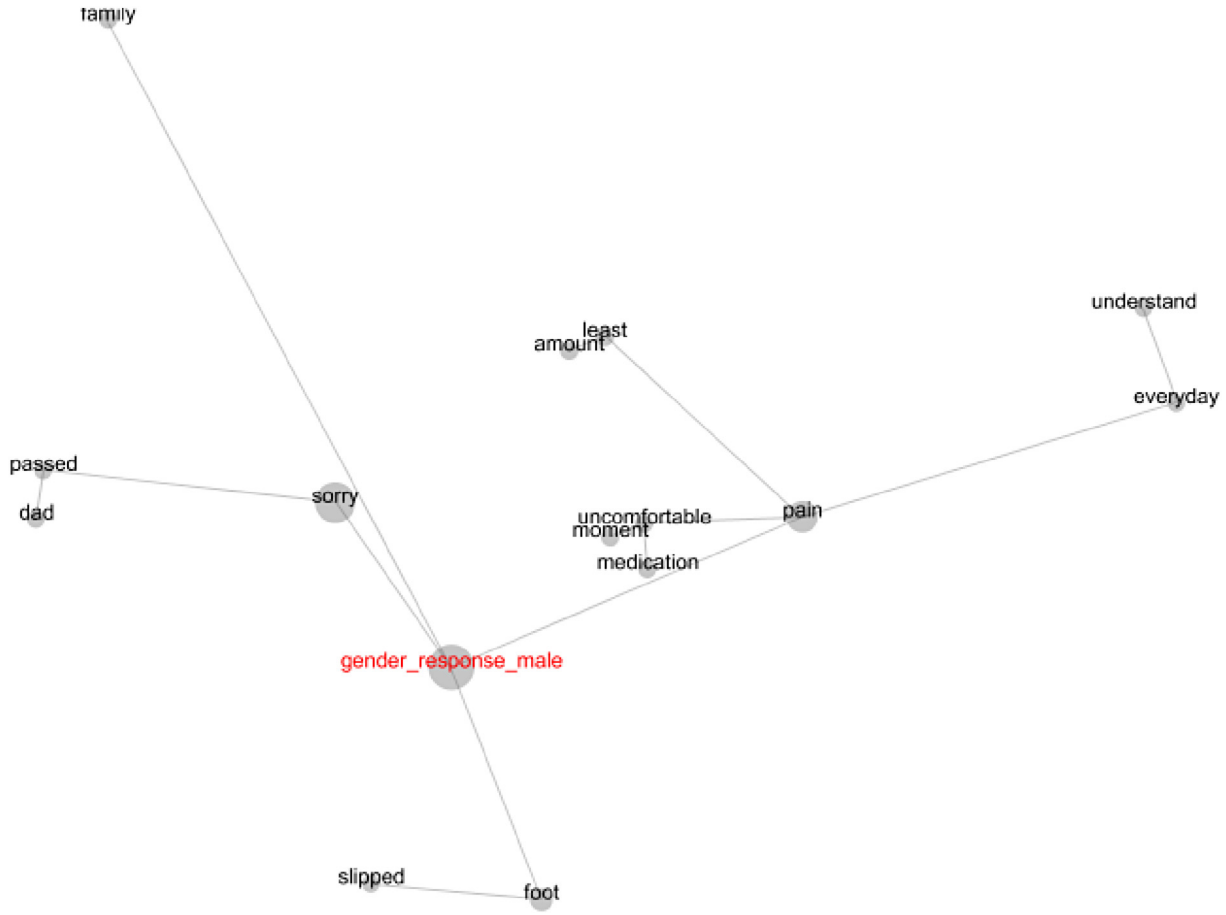

Fig. 2. Collective cognitive map of empathy expressed by male nursing students.

others. People who adopt expressive logic in the message may fail to recognize that the expression in communication can serve other goals and ignore the importance of contextual factors. Therefore, in expressive message design, messages aim to reflect speaker's current mental state and are not dependent on interpretation and contextual information.

Given the characteristics of expressive message design, in nurse and patient relationship, expressive logic message can be conceptualized as a nurse's response which reflects his/her current mental state of knowing what happens on the patient, such response is from nurses' professional training. As cognitive empathic response in nurse and patient relationship emphasizes the value of objectivity, expressive logic message in this study can be considered as cognitive empathic response, which only focused on what nurses want to know of patients' current situation related, rather than understanding whether such situation would cause severe pain or depression for patients.

Conventional logic is based on the premise of social norms, which considers "communication as a game played cooperatively, according to socially conventional rules and procedures" (O'Keefe, 1988, p. 86). In the game, speakers are supposed to achieve the goal which is proper in specific context, while hearers are expected to cooperate with the speaker and respond to speaker's intentions based on the context they are in. Conventional logic focuses on the cooperation between the speaker and the hearer and values contextual factors. There are different cues in a context, and each cue has a corresponded response. As long as a cue is activated, people are supposed to make appropriate response accordingly.

In terms of this logic in nurse and patient relationship, conventional message logic can be conceptualized as a nurse's response to an activated cue in the context a patient is in. For instance, when patient mentions pain, nurses are expected to show concern and care to patient's pain. Since affective empathic response concentrates on understanding others' emotional state, in this study conventional messages can be defined as affective empathic response which indicates how nurses can grasp the contextual cues inferred by the patients and respond to those cues properly. For example, when a patient told a nurse that she felt there's a severe pain in her arm, instead of asking the patient what causes that pain, a nurse is supposed to show his/her concern and care to the patient (e.g., I am sorry that you are experiencing such pain).

Rhetorical message logic perceives communication as the creation and negotiation of social selves and the contexts; it believes that the context can be created through communication process. Under this logic, people tend to view the relationship between themselves and the context as a social negotiation. Comparing it with conventional logic design, instead of considering the context as fixed and the response should be based on the context, from rhetorical aspect, context is created by the message and communication process and there is no fixed meaning in message. Thus, under rhetorical message, communication is not a reaction of prior condition or a response depends on social convention, instead rhetorical message is more forward-looking and related to context creation. In sum, in rhetorical design message, context is designed by the message, and the communication process is featured by negotiation and coordination between the selves and volatile context.

In nurse and patient relationship, rhetorical message can be conceptualized as a nurse's response to a patient based on the communication between the nurse and the patient. In the context of nurse and patient relationship, the communication often centers on the patients' illness and their sufferings. In terms of that, affective empathic response, which aims to resolve patient's negative emotions, can be

considered as component of rhetorical design message. In addition to that, to enhance the patient's confidence to cope with the disease and relieve their distress from current pain, a possible solution should also be embedded in nurse's response. For example, when a nurse asks a patient what is his/her pain level from 1 to 10, if the patient replies as 8, the nurse is supposed to say that I am sorry to hear that; I will try to lower your pain level.

2.3. Gender differences in empathic response

Empathy is an innate human quality, but the ability to recognize and communicate it varies among people. Both stereotypes and empirical findings suggest that women have higher levels of empathy than men (Gault and Sabini, 2000; Klein and Hodges, 2001). Stereotypically and as supported by research, women are assumed to have greater level of interpersonal sensitivity than men. For example, Derntl et al. (2010) found that women perceived themselves have more empathy than men in their self-report, and Thompson and Voyer (2014) found that women are better than men in empathy recognition. Although females and males have similar empathic ability, females have higher level of motivation to present themselves as highly empathic, which is consistent with the gender stereotype of empathy (Graham and Ickes, 1997).

Previous research revealed that females are more apt than men in affective role taking (Puka, 1994), they are more likely to identify people's thoughts and feelings accurately (Ickes et al., 2000). Women are also more articulate at empathic response than men (Toussaint and Webb, 2005) and are more likely to deliberately express their concern for others, or communicate their empathic response (Christov-Moore et al., 2014). Previous studies have also found that female physicians are more likely than their male colleagues to recognize and experience others' feelings (e.g., Hegazi and Wilson, 2013; Hojat et al., 2002a, 2002b). Although Hegazi and Wilson (2013) found that male nurse students' empathy can be increased as progressed in their training, female nurses are still superior to male nurses in expressing empathy. Brunero et al. (2010) proposed to improve empathic response by having a better understanding of interpersonal style, culture, and environment (Alligood and May, 2000), all of which can influence empathy. Therefore, we formulate the following hypothesis:

H1. Female nursing students are more likely than male students to express empathy when presented with an opportunity to do so.

Gender-based differences in the likelihood of empathic response in health situations has received sufficient academic attention to suggest a hypotheses, but the quality of empathic responses remain highly debated. In the medical context, ample previous studies found that female physicians present more empathy and interaction with patients than their male counterparts (Hojat et al., 2002a, 2002b; Roter et al., 1991; Van den Brink-Muinen et al., 1998). In addition, prior work also revealed why male nurses are considered as incompetent in providing empathy and care. The stereotype of men as sexual aggressors, and the fear of losing masculinity make male nurses succumb to societal gender norms to express less empathic behavior in their work (Evans 2002; Evans and Frank, 2003). In sum, research on gender differences in expressing empathy in nursing has examined individual differences in empathy expression and what causes such discrepancy.

Some research on empathy cognition from the perspective of neuroscience suggested that males and females experience different brain activity in situations of empathic response. Specifically, the empathizing-systemizing theory posits that males have stronger systemizing process in their brain, through which they tend to identify a system that takes inputs, which can then be operated on in variable ways, to deliver different outputs in a rule-governed way (Baron-Cohen et al., 1999). Conversely, females have a stronger empathizing process in their brain (Baron-Cohen and Wheelwright, 2004) and are better than males in emotion recognition and social sensitivity for social norms (Baron-Cohen et al., 1999; McClure, 2000). In its original conceptualization, the theory suggested that females are naturally more empathic. While the main premise of the gender-related tendencies for systematizing has been supported, the proposition that empathic and systematizing abilities are inversely correlated has been contested (Escovar et al., 2016), which suggests a greater role of social learning factors that explain cognition and communication efficacy in empathic response (Benenson, 2003). Therefore, this paper puts forth the following research questions:

RQ1. To what extent is the quality of message logic in empathic responses provided by female nursing students is higher than that provided by male students?

RQ2. What are the linguistic differences in the cognitive mapping of empathy by female and male nursing students?

3. Methods

3.1. Design

This study reports on a retrospective data analysis of transcripts of conversations between undergraduate nursing students and a virtual patient, Tina Jones (*Health Assessment Digital Clinical Experience*, 2016). The transcripts were produced during a simulated health assessment; they contained questions and statements typed by nursing students and standardized pre-recorded responses from a virtual patient. The study was approved by an institutional review board prior to data analysis.

3.2. Sample

The data were obtained from 343 undergraduate nursing students. The students attended a Health Assessment course at nursing schools in one of eight states (CA, CO, FL, IL, KS, NY, PA, and WI). The nursing schools included in the study were chosen based on the course instructors' use of the simulation as a formative assessment for course credit. Courses ranged from 12 to 15 weeks and began in May 2015. The health history simulation was given as a homework assignment in the first or second week of the course. All students completing the assignment were included in the dataset. Complete demographic information is not available because the students were not required to provide it at the time of the simulation use.

3.3. Procedure

During the development of the educational script, six nursing educators identified nine patient disclosure situations as valid opportunities for a skilled nurse to express empathy. Depending on the questions asked during the exam, nursing students could encounter up to 9 patient disclosure opportunities that warranted the expression of empathy expected of nurses competent in communication with patients.

Throughout the virtual health assessment simulation, students typed questions to obtain health history information from the virtual patient, whose pre-programmed responses were enabled by a natural language processing solution. The simulation interface provided students with an opportunity to ask questions and provide statements by choosing one of the options, Ask, Emphasize, or Educate. Responding to the information shared by the patient, students labeled the statements they thought showed empathy. The data, therefore, included unambiguous indications of the students' intent to be empathic as recorded by the students themselves.

3.4. Instrument

A codebook was developed to assess which message design logic was used in the statements that nursing students self-identified as empathic (Strekalova et al., 2017b). The codebook was developed by the

first author and refined through discussions during meetings of senior lab members. Next, the 20 empathy responses were coded using the codebook and interrater reliability calculated. The codebook was then refined and the same process repeated twice with new data. The final codebook included conceptual definitions of each message design logic as well as representative examples. Once the initial codebook development was completed, student coders where trained on the use of the codebook and their questions active sought and addressed for the initial coding batch, which has shown acceptable intercoder reliability. The raters with background in communication research who were blind to research questions received 20 h of training. Once intercoder reliability was established, each rater coded the dataset in full. The coders achieved an overall acceptable reliability level across 9 opportunities, Krippendorf's *alpha* = 0.829 (Krippendorff, 2018), with intercoder reliability for individual opportunities ranging between 0.7 and 0.96. Coders and first author met weekly to review emerging questions related to code assignment and ensure face validity of the codebook.

The statements were coded as *expressive, conventional,* or *rhetorical*, assigning values of 1, 2, or 3 respectively. Conceptually, expressive messages are the least sophisticated, followed by conventional and then rhetorical. Therefore, assigned message logic values were treated as a scale representing different levels of empathy communication skills. If a student provided more than one empathic statement per opportunity, all statements were considered one unit of analysis and coded together. The codebook operationalized *expressive* messages as repetitive mirroring of the patient's disclosure, irrelevant statements, or not providing any conventionally expected words of empathy or understanding. *Conventional* messages were operationalized as statements that could be expected in general situations that call for the expression of empathy, understanding, or support. These statements addressed the disclosed information directly, but did not provide any suggestions or solutions that would help the patient move beyond the challenge of the disclosed situation. Finally, messages were coded as *rhetorical* if they contained a conventionally expected expression of empathy or support, and also provided the patient with an opportunity to find relief from or move beyond the disclosed situation.

4. Results

In total, nursing students had an opportunity to encounter 3087 potential disclosures (9 for each of the 343 students) and have entered encountered 1625, of the average of 4.7 disclosures. For the encountered patient disclosures, students provided empathic responses to 33.54% (n = 545) disclosures, or the average of 1.6 empathic responses per exam.

H1 predicted that when presented with opportunities to express empathy female students will use such opportunities more frequently than male students. A chi-square test was used, and this hypothesis was supported, χ^2 (1, N = 1625) = 10.24, $p < .01$. As predicted, the test showed that males were less likely to follow-up with empathetic responses than females.

To answer RQ1, the data were filtered to include the opportunities that were encountered and followed up by nursing students (n = 450). A one-way ANOVA test was used, and showed no differences between the gender groups, F(1, 449) = 0.5, p = .82. Specifically, the level of empathy expressed by male students (M = 2.00, SD = 0.57) reached the same level of empathy as that for female students (M = 2.02, SD = 0.61).

To answer RQ2 and assess the linguistic differences in the cognitive expression of empathy, textual analysis software, Leximancer, and latent semantic analysis were used. Student empathy statements were measured for the presence and frequency of concepts, or words and phrases representing each concept. Graphical representations of cognitive maps are depicted in Figs. 1 and 2. Overall, cognitive expression of empathy by female nursing students employed an overall larger number of concepts, which corroborates and provides additional insight for the H1 findings. The analysis also showed that female and male expressions of empathy were different in two ways: (1) female nursing students identified more first-order concepts related to empathy, and (2) female nursing students had a higher hierarchical complexity of empathic response.

5. Discussion

This study assessed the differences in the expression of empathy among female and male nursing students. Nursing students submitted and self-identified empathy statements. The statements were subsequently coded by three raters to assess the quality of the language that was used to express empathy. This study's hypothesis, which was supported, asserted that female nurse students are more skilled than male nurse students in expressing empathy when an empathic opportunity is presented. This finding is aligned with the previous research on gender and empathy. Roter et al. (2014) found that compared with male physicians, female physicians tend to have more emotional response to the patients, while also spending more time with patients. Sandhu et al. (2009) also found that female doctors intend to be more emotional, self-revealing, and show more concern to the patients. This study, however, provides additional explanations to this previous research by showing that females have a stronger ability to recognize and cognitively connect opportunities, which can warrant an empathic response.

The first research question explored the relationship between gender and quality of empathic response. While female nursing students recognized more opportunities, their empathic response quality bared no difference from their male counterparts. This result indicates that the differences in male and female nurses relate to their ability to identify the situations and cues for empathy but not to the skills to express it. Male students reacted empathically to most frequently recognized situations, e.g., complaints about pain and sharing of a loss of a parent. Emotive reaction from males is a social norm, and the situations of them can be frequently vicariously experienced and rehearsed in clinical and non-clinical contexts, which can explain the lack of differences in the quality of empathic responses from male and female students. Practically, this finding signals that tailored training strategies are needed to aid in developing cognitive models of empathy and empathic response. More specifically, male nursing students can benefit from communication training that focuses on identifying opportunities to express empathy in situations that present challenges for patients by go beyond the expression of pain and grief (e.g., difficulty processing or acting on medical advice or barriers to chronic diseases management).

This study also showed that theorizing about empathy based on the message design logic can explain differences in patient-provider communication. Incorporating expressive design logic, conventional design logic, and rhetorical design logic in empathic response respectively reflect cognitive, affective, and the combination of cognitive and affective empathic response. While gender was the focus construct of this study, other variables should be assessed as well. As noted earlier, empathic response could be associated with longer time spent with patients. Therefore, time could serve as a moderator whose interaction with message design should be assessed empirically. Furthermore, in nurse and patient relationship, cognitive empathic response helps nurses understand patients' pain and suffering, affective empathic response allows nurses to recognize patients' pain and provide appropriate emotional response. The combination of cognitive and affective empathic response is considered as an optimal response to take the advantage of both cognitive and affective empathic response, and make the deficiencies of either empathic response.

6. Conclusion

Male nurses are capable of the same levels of empathy as female nurses. However, they pursue fewer opportunities to use empathic language. This could reflect on the social norms and cultural

stereotypes that men may face in the workplace where they are not expected to behave as warmly as their female counterparts. Communication skills training for nurses could benefit from curriculum that focuses both on the quality of empathic responses as well as on its context. The analysis of the message logic in empathic messages can aid in developing appropriate communication skills training materials. Furthermore, the understanding of the components of empathic message response provides a conceptual foundation for the development of gender-sensitive interventions in nursing education curriculum lacks to support and promote male nurse empathy skills. Such tailored training could aid in lifting the stereotypes of gender bias in nurse and patient relationship and enhance the overall quality of nurse-patient relationships.

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Conflict of interest

None of the authors declare any conflict of interest.

Ethical approval

Protocol for this retrospective study has been reviewed and approved by the University of Florida Institutional Review Board.

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