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Nursing students' empathic communication: Role in recognizing and treating chronic pain patients

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ABSTRACT

Objective: A substantial body of research supports what many nurses know from experience: empathy is at the heart of providing quality care. The major objective of this study was to identify unique mechanisms through which higher empathy translates into greater intentions to treat patients in pain employing novel methodology.
Methods: Using an ecologically-valid scenario methodology, student nurses (N = 156) reviewed the narrative of a patient in chronic pain. They completed standard, valid measures of empathy toward the patient, perception of the patient's pain, and intention to provide pain-relieving treatment. Nursing student's personality traits were assessed and perception of patients' age and sex were experimentally manipulated.
Results: Empathy was associated with higher intention to treat the patient in chronic pain irrespective of patients' age or sex. A moderated-mediation analysis confirmed that nursing students with higher empathy perceived the patient in the scenario as being in greater pain. This was correspondingly associated with higher intention to provide treatment. Nursing students' trait Extraversion was a moderator.
Conclusion: Empathy not only improves rapport between patients and providers but is related to intentions to provide pain-relieving treatment.
Practice implications: The clinical and educational importance of empathy in patient-provider relationships are discussed.

1. Introduction

Empathy is fundamental to the nurse-patient relationship and quality care [1]. While empathy is a multidimensional construct, we define it as the cognitive ability to understand another person's feelings and perspective and communicate that understanding [2]. Empathy is critical in caring for patients in chronic pain as their condition is often invisible to observers. When patients perceive providers as empathic, they are more likely to adhere to treatment regimens and perceive providers as competent [3]. Beyond these improved aspects of the provider-patient relationship, we suggest that greater provider empathy also translates to action: to providers making necessary recommendations for relieving pain. Specifically, more empathic providers may be more likely to offer treatment because they are more able to perceive the patient's pain. The current research employed an experimental design to investigate relations between nursing students' empathy (i.e., empathic concern, perspective-taking), perception of patient pain, and intention to provide pain-relieving treatment to a perceived chronic pain patient depicted in a scenario. The depicted patients were presented as varying in age (i.e., older, younger) and sex (i.e., male, female) to assess whether these characteristics biased intention to provide pain relief.

1.1. Nursing students' empathy and intention to treat chronic pain

Empathy in nurses is critical for their ability to understand patients' perspectives, foster patients' trust and deliver truly person-centered care [2]. Both patients and experienced providers list empathy as one of the most important qualities for nursing school graduates to have [4]. Nursing schools have been increasingly implementing empathy education, primarily through experiential learning and simulation exercises, in recognition of its importance in the provider-patient relationship [5]. Such educational tasks include asking nursing students to role play as a patient in a specific care setting (e.g., role playing everyday tasks of a visually impaired patient) and then participating in a reflection [6]. However, these educational practices have been critiqued for only teaching the mechanisms and techniques for empathy without helping

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students develop empathic understanding [7]. Accordingly, nursing students may develop an aptitude for empathic communication styles, but this may not necessarily translate to their ability to understand the patient's perspective.

While experiential learning and simulation exercises can increase overall empathy in nursing students, there may be individual differences in empathy [8]. For example, prior research suggests that empathy seemed to decrease as nursing students gained more clinical experience [9]. Nursing students viewed patients' pain as less severe and in need of less urgent treatment compared to nursing students without clinical experience. However, nursing students who started the study with greater levels of empathy were protected from this acclimatization to patients' pain: they continued to report greater perceived intensity of patient pain regardless of their level of clinical experience.

Nurses' perceptions of patient pain may be particularly important for their intentions to provide pain-relieving treatment. Nurses tend to administer pain relief based on their own assessments of patient pain rather than the patient's assessment of pain [10]. Accordingly, patients may not receive adequate treatment for pain if nurses perceive their pain as not being severe or urgent [11]. Prior research indicates biases regarding pain treatment in the healthcare system (e.g., undertreating pain to avoid overprescribing opiates) that may act as barriers to patients receiving sufficient pain management [12]. In contrast, nurses' empathy may facilitate greater intention to treat pain because empathic nurses regularly engage in taking the patient's perspective. Doing so serves to alleviate generalized biases [13]. In addition, providers who engage with patients more empathically tend to elicit more concerns from patients, which, in turn, helps to inform effective treatment plans [14].

1.2. Perceiving patient characteristics: pain severity and demographics

Clinical ambiguity is a hallmark of chronic pain care. We define clinical ambiguity as a scenario in which a patient's pain report is inconsistent with objective findings [15]. In such instances, cognitive load for providers is high due to the complexity of the situation, and they are more likely to rely on stereotypes in their decision-making [16]. Accordingly, patient characteristics (i.e., pain severity, age, sex) may affect nursing students' perception of chronic pain and their intentions to treat. For example, patients' self-reported pain level may be discrepant with visual cues such as their facial expressions, as well clinical assessments like vital signs and location of pain compared to physical exam or medical imaging. When pain rating is discrepant between providers and patients, patients are at risk of being undertreated [17]. While no study to date has tested the effect of clinical ambiguity on nursing students' intention to treat, a handful of studies have examined medical students. For example, one study found that medical students were less likely to prescribe treatment for pain when patients' facial expressions were neutral even if their pain reports were high [15].

Appropriate pain treatment may be further affected by demographic stereotyping. For example, older adults tend to be at high risk of undertreatment for pain due to biased views of pain as an unavoidable part of aging [18]. This can lead providers to perceive older adults' pain as less treatable, or even to discount patient reports [19]. In addition, research suggests women are at greater risk of undertreatment when self-reporting the same level of pain as male patients [20]. Women have been documented to be undertreated for pain across a variety of chronic conditions including neck pain and low back pain [21,22]. Accordingly, we manipulated patient age and sex to test potential biases in how student nurses responded to patient communication regarding pain.

1.3. Empathy, patient characteristics and intention to treat chronic pain

Nursing students who are high in empathy may show greater intention to treat chronic pain. Prior studies across healthcare indicate that when providers are more empathic, chronic pain patients report decreased pain symptoms [19,23]. Nursing students may be guided by their empathic focus, feeling genuine concern and taking the patient's perspective in their assessment of patients' pain severity. Nurses high in empathy tend to perceive patients as in greater pain than less empathic nurses [9]. This greater perception of patients' chronic pain may motivate their intentions to provide more pain-relieving treatment (i.e., compared to less empathic counterparts). Indeed, nurses who rely on stereotypical thinking rather than empathic perspective-taking when treating patients' pain have been shown to prescribe no pain medication or suboptimal doses [12]. This undertreatment of patients' pain may be especially likely in scenarios in which patients are older in age or are women, due to societal biases that manifest in healthcare settings [18, 20].

In addition to trait empathy, the personality factors of extraversion and neuroticism may also play a role in how providers respond to patient communications of pain. Prior research indicates that greater trait extraversion is associated with greater nursing competency [24]. Nurses higher in extraversion also report greater compassion satisfaction, which is the feeling in healthcare settings that it is a pleasure to help others in stressful life situations [25]. Conversely, greater trait neuroticism is related to greater stress levels and rates of burnout in nursing students and nurses, as well as worse nursing competency [24–26]. Taken together, nursing students with greater trait extraversion may facilitate greater empathic response and intention to treat chronic pain patients whereas those with greater trait neuroticism may demonstrate the reverse.

1.4. The present study

This study examined student nurses' empathy level as a critical factor in the communication between provider and patient. The study is the first to assess whether empathy level affected nursing students' intention to provide treatment for a chronic pain patient depicted in a carefully constructed scenario. The scenario method allowed patient demographics (i.e., age, sex) to be experimentally manipulated using photographs. Level of patients' pain was presented through student nurses reading a carefully constructed personal report of pain attributed to the patient. This scenario methodology was designed to maximize ecological validity.

The first study aim was to examine whether greater empathy (i.e., empathic concern, perspective-taking) in nursing students predicted greater intention to treat the perceived patient (i.e., recommend treatment, provide treatment) after reading patient communication regarding their pain. The second aim was to examine whether this relation held regardless of the perceived patient's age and sex. The third aim was to examine whether the relation between nursing students' empathy and their intention to treat was mediated by their perception of the patient's pain severity. Finally, we examined student nurses' trait personality (i.e., neuroticism, extraversion) as a moderator in the mediation analysis as an exploratory aim. Thus, the study makes a strong contribution by filling an important gap in the research literature in the manifestation of empathy in nursing. Our findings shed light on several characteristics of the nurse (i.e., empathy, pain perception, personality traits) and also of the patient (i.e., their age and gender) that influence decisions to treat patient in chronic pain.

2. Method

2.1. Participants

Participants were 156 female student nurses (19–50 years old; $M = 23.56$; $SD = 4.95$) living in the southeastern United States. The acquired sex imbalance in the sample aligns with predominance of women in the profession. These student nurses self-reported as 71.9% Caucasian, 10.8% Hispanic, 9.0% Asian/Pacific Islander, and 8.4% African American.

2.2. Procedure

In this IRB approved study (no: 2007-U-827), nursing students were recruited through listservs, websites, and class presentations at a large R1 university. Participants first completed an informed consent and completed the study online in approximately 40 min and were compensated with $10 US. Foil items were embedded in the survey to check whether participants were reading the items (e.g., "Answer '3' for this item").

Participants were randomly assigned to one of four scenario conditions (i.e., patient is a 25-year-old male, 25-year-old female, 85-year-old male, 85-year-old female). They were presented with a photograph of the patient, including their age. Photographs were black-and-white images of the same person when they were young (approximately 25 years old) and older (approximately 85 years old) with neutral to positive facial expressions (see Appendix). After viewing the patient photo, dependent on their scenario condition, all participants received the same patient information.

They were asked to consider themselves in the role of a community health nurse who sees many patients every day as part of their full, busy caseload. They were told that the patient whose photo they had seen (i.e., Ms. J or Mr. J) lives alone in the community and suffers from chronic pain due to polyarthritis (i.e., a painful, inflammatory condition), is seen by a local family physician, and managed with a pharmacological treatment plan. Specifically, they were told: "Ms./Mr. J is experiencing an active 'flare-up' and you are assigned to see him/her today. Please read Ms./Mr. J's story closely and carefully as the rest of the survey depends on you having understood it. When arriving at Ms./Mr. J's home, he/she describes his/her condition to you in the following way."

All participants were then presented with a pain narrative purportedly written by the patient (including their age as 25 or 85 years old; See Table 1). The narrative was developed for this study by a person in chronic pain in combination with a literature review identifying the most common dimensions of chronic pain [27]. The procedure was pilot-tested [28]. After reading the narrative, participants completed a short version of the Interpersonal Reactivity Index (IRI) with instructions modified to capture empathy particularly for this patient [29]. They also completed the Intention to Provide Treatment (IPT) Questionnaire, relative to the perceived patient [30]. Finally, a personality trait measure (Big Five Inventory, BFI-10), manipulation checks, and a social desirability scale (the Balanced Inventory of Desirable Responding; BIDR) were administered [31,32]. In the manipulation checks, nursing students were asked to correctly report the patient's age and sex to test whether they had indeed paid attention to the picture and patient information.

2.3. Measures

2.3.1. Nursing students' empathy and trait personality

2.3.1.1. Empathy. The IRI is a self-report measure assessing empathy with 28-items rated on 5-point Likert-type scales [29]. The study used 14 items, 7 representing perspective-taking and 7 elucidating empathic concern, as these were most relevant to the current study. Items were altered so that responses reflected how participants were feeling in reference to the perceived pain patient. Subscales showed acceptable reliability (Perspective taking: $\alpha = .60$, Empathic concern: $\alpha = .76$).

2.3.1.2. Big five inventory. Two BFI-10 subscales were administered to assess extraversion (e.g., *I see myself as someone who…is outgoing, sociable*) and neuroticism (e.g., …*gets nervous easily*) [31]. Two items, rated on a five-point Likert scale from 1 = strongly disagree to 5 = strongly agree, assessed each personality trait. Pearson correlations showed good interitem reliability for both subscales (extraversion: $r = .47$, $p < .001$; neuroticism: $r = .31$, $p < .001$).

2.3.2. Patient characteristics

2.3.2.1. Perceived pain severity. The student nurses' perception of the patient's pain severity was assessed using two items from WHYMPI: (1) *How severe do you think the patient's pain is?* and (2) *In general, how much do you think the patient's pain interferes with their day-to-day activities?* [33]. Responses were rated on a Likert scale from 1 = *not at all severe/no interference* to 7 = *extremely severe/extreme interference* ($r = .43$, $p < .001$). Higher values denote greater perceived pain severity. Across the two items, participants rated the perceived patient as experiencing a moderate to high level of pain, ($M = 6.50$, $SD = .55$).

2.3.2.2. Age and sex. Participants had been randomly assigned to patient characteristic scenario conditions (younger, older, by sex). In the young patient condition 94% correctly reported the patient's exact age, and all reported it within five years of the exact age. In the older patient condition, 72.3% of participants correctly reported the patient's exact age and all reported the patient's age as being in the societal-defined stage of older adulthood (i.e., 65 years or older). All participants correctly reported the patient's sex.

2.3.3. Intention to provide treatment

To assess intention to provide treatment, a list of 16 appropriate strategies to relieve chronic pain was developed in consultation with a professional nursing educator and researcher [30]. The list included both non-pharmacological treatments such as application of heat and cold, and pharmacological treatments such as prescription pain medication. Items were designed to reflect the following two levels of effort that the student nurse is willing to engage in to assist the patient.

Table 1
Patient scenario: chronic pain narrative.

Chronic Pain Narrative
About five years ago, I found out I had a painful disease that will last the rest of my life. It can be in all of the joints in my body. Nothing that I have tried so far has really helped – so it's tough. When I 'flare up' it can be quite painful. One of those flares started yesterday, which was even worse than usual because it happened to be my [25th/85th] birthday yesterday too. This time, it was mostly in my hips, which really limits how I can move because of course your hips are so central to moving around: getting up, sitting down, and walking. For about two days prior I felt throbbing pain in my hips and I was so worried that it was going to get worse. Then I started becoming achy in my lower back as well. So I tried to just calm myself down. The doctor told me that hot showers could be useful in this situation. So last night I sat on my shower chair and let the hot water hit my sore joints, got ready for bed, and then tried to sleep. Unfortunately, I didn't get much rest. I was worried as I was lying there because I never know how painful it will get or how long it will last. Of course, that made it harder for me to just settle down and sleep. I kept thinking about how I was possibly going to get done all the things that I needed to do today. It was really frustrating. Well, I awakened this morning to 'face a new day' but I was still extremely achy and now I am very tired as well. After a while, I carefully got out of bed and got my walker from my bedroom closet. I walked out of my bedroom to the kitchen and then was walking toward the fridge to get some orange juice. I felt a sharp pain right as I reached for the handle. I froze and leaned over the counter wincing. Words really can't describe how the pain affects me. The pain…and then the feeling that I can't do anything about it. Well, I forgot about the orange juice. With my walker I slowly made my way back to my bed to lie down. I used to really dread using the walker. I don't like feeling I need to rely on it. Anyways, my day was supposed to just be beginning but it felt like it had already ended. I had all these plans for what I needed to do today. … but I didn't get any of it done. Well, my [25th/85th] birthday sure wasn't a very positive one…and today is no better! This is the worst flare I have had in years.

2.3.3.1. Recommending treatment. Eight items focused on *recommending* treatment to the perceived patient. Participants reported their intentions to engage in each behavior on 7-point Likert-type scales (1 = extremely unlikely to 7 = extremely likely). The scale showed good internal consistency (α = .76).

2.3.3.2. Providing treatment. Eight items focused on *providing* treatment to the perceived patient. Participants reported their intentions to engage in each behavior on 7-point Likert-type scales (1 = extremely unlikely to 7 = extremely likely). The scale showed good internal consistency (α = .69).

2.3.4. Manipulation checks

2.3.4.1. Comprehension of patient's pain narrative. Manipulation checks were used to ensure that the student nurses had read and comprehended the pain narrative provided in the scenario. Three multiple choice questions were used to determine if they had comprehended key aspects of the narrative: what the patient got from the fridge, how long their illness was expected to last, and how often the patient uses a walker. In addition, participants rated their perceived level of similarity to the patient on a 7-point Likert-type scale.

2.3.4.2. Social desirability. The BIDR was included as a potential covariate because empathy and intentions to provide pain treatment are pro-social values [32]. People with high need for social desirability may over-report feelings of empathy and intentions to provide care. The BIDR has 40 items rated on 7-point Likert scales (1 = not true to 7 = very true). The questionnaire includes two subscales (i.e., self-deception & impression management) and showed good internal consistency (α = .73).

3. Results

3.1. Preliminary analyses

Preliminary analyses included a manipulation check to ensure participants understood the patient pain narrative and a check for socially desirable responding.

3.1.1. Comprehension of patient's narrative

This manipulation check ensured that participants read and understood the pain narrative presented in the scenario. One-hundred sixty participants (95.8%) correctly responded to all three reading comprehension questions. Participants did not rate themselves as similar to the perceived patient ($M = 1.89$, $SD = 1.39$) regardless of condition.

3.1.2. Socially desirable responding

Bivariate correlations were conducted between the BIDR subscales, the IRI and the IPT. BIDR subscales were not related to IRI empathy subscales (r range −.06 to.07, all $ps > .05$) or IPT subscales (r range −.11 to.01, all $ps > .05$) so were not used as covariates in subsequent analyses.

3.2. Main analyses

Two stepwise regressions were used to address Aims 1 and 2. Perceptions of the patient were predictors in Step 1 (i.e., age, sex, and pain severity). Step 2 included student nurse characteristics (i.e., empathy: perspective-taking, empathic concern; trait personality: neuroticism, extraversion). Intentions to recommend treatment for the patient and take action to treat the patient were respective criterion variables. Table 2 shows full models.

In the first regression, Step 1 results indicated that perceiving the patient as in greater pain related to higher intention to recommend treatment. However, when student nurses' characteristics were added (Step 2), higher empathy (i.e., perspective-taking) predicted intention to recommend treatment. The second regression analysis showed greater perception of the patient's pain and higher empathy (i.e., perspective-taking) were both associated with greater intention to take action to treat. There were no effects of perceived patients' age or sex in either model. Only extraversion showed a trending relation to intention to treat in either model.

3.2.1. Moderated-mediation analyses

To address our third aim, two moderated mediation analyses were conducted using PROCESS macro with 5000 bias-corrected bootstrap resamples (see Fig. 1) [34]. We followed standard procedures for testing indirect effects. Based on findings from the regression analyses, the two moderated-mediation analyses examined perceived patient pain severity as a potential mediator in explaining the relation between empathy and intention to treat a patient in pain. Given the trend for extraversion in the regression analyses, we explored nursing students' level of extraversion (not neuroticism) as a potential moderator in the moderated-mediation analyses.

3.2.2. Intention to treat: recommending treatment

Moderated-mediation analyses showed nursing students with higher

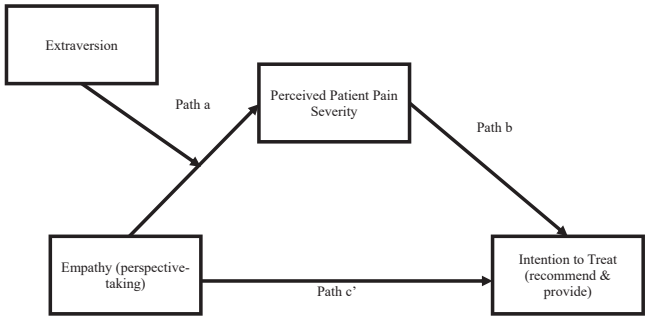

Fig. 1. Visualization of the moderated-mediation analyses. *Note*. The figure visualizes the two moderated-mediation models in which the relation between empathy and intention to treat (i.e., recommend vs provide) were assessed (path c) with pain severity as a potential mediator in explaining this relation (path b) and extraversion as a potential moderator (path a).

Table 2
Stepwise regressions predicting intention to treat (IT): recommend and provide.

Criterion variable	Predictor variable	Step 1 β	Step 2 β	Criterion variable	Predictor variable	Step 1 β	Step 2 β
IT - recommend	Patient's age	-.07	-.08	IT - provide	Patient's age	-.02	-.02
	Patient's sex	-.07	-.06		Patient's sex	-.14	-.13
	Patient's pain	.21**	.13		Patient's pain	.24**	.19*
	Empathy - WC		-.05		Empathy - WC		-.09
	Empathy - PT		.34***		Empathy - PT		.24**
	Extraversion		.14(*)		Extraversion		-.03
	Neuroticism		.05		Neuroticism		.03
F		3.12*	4.72***		*F*	4.14**	2.82**
Adj. R^2		.04	.14		*Adj.* R^2	.05	.07

(*) = $p < .07$, * $p < .05$, **$p < .01$, ***$p < .001$. For the Empathy scale: WC is Warmth-Concern, PT is Perspective-taking. N = 167.

levels of empathy tend to perceive patients as being in greater pain and this is associated with greater intention to recommend treatment. The relation between empathy (i.e., perspective-taking) and perception of pain was significant overall but held most strongly for those higher in extraversion. That is, the index of moderated-mediation was significant, $b = .06$, 95% percentile CI [.0001,.14], providing evidence for a moderated mediation (i.e., zero not within the CI). In terms of moderation, the conditional indirect effect was strongest for nursing students high on extraversion (+1 *SD*), $b = .14$, percentile CI [.005,.29], weaker but still significant for moderate (*M*) extraversion, $b = 08$, 95% CI [.003,.20] and weakest and not significant for those low in extraversion (- 1 SD), $b = .02$, 95% CI [−.043,.13].

For the a-path from empathy to pain severity there was a significant interaction between empathy and extraversion, $b = .26$, $p = .016$, $\Delta R^2 = .03$. The conditional effect from empathy to pain severity was strongest for high values (+ SD) of extraversion, $b = .56$, $p < .001$, it was weaker but still significant for medium values (*M)* of extraversion, $b = .33$, $p = .0005$ and not significant for small values (- 1 *SD)* of extraversion, $b = .09$, $p > .05$. The b-path from pain severity to intention to recommend treatment was close to significant, $b = .24$, $p = .052$. The direct effect from empathy to intention to recommend treatment (path c) was significant, $b = .67$, $p < .001$. Full moderated-mediation results are displayed in Table 3.

3.2.3. Intention to Treat: Providing Treatment

As in the analyses predicting recommending treatment, results of the models for providing treatment show nursing students with greater empathy perceive the patient as having more severe pain and are in turn more willing to provide treatment. The relation between empathy and perceived patient pain was strongest for those higher on extraversion and was not significant for those low on extraversion.

That is, the index of moderated mediation was significant, $b = .07$, 95% percentile CI [.0029,.1554] overall. Note however that, again, the conditional indirect effect between empathy and perceived pain severity was strongest for nursing students high on extraversion (+1 *SD*), $b = .16$, percentile CI [.011,.32]. It was weaker but significant for moderate (*M*) extraversion, $b = .09$, 95% CI [.01.22] and weakest and not significant for those low in extraversion (- 1 SD), $b = .05$, 95% CI [−.05,.15].

The a-path was identical to the first moderated-mediation model. The b-path from pain severity to intention to provide treatment was significant, $b = .29$, $p < .05$. The direct effect from empathy to intention to provide treatment (path c) was also significant, $b = .42$, $p < .01$. For the full model see Table 4.

4. Discussion

Prior research has found that nurses lower in empathy are more likely to undertreat pain [9,12]. The current findings support education regarding empathy as a vital component of nursing student training, particularly when relating to patients in chronic pain. Using an ecologically-valid scenario methodology this study investigated whether student nurses' empathy toward a perceived chronic pain patient influenced their intention to provide pain-relieving treatment. The scenario methodology, using photos and narratives, was effective: nursing students rated the perceived patient as in moderate to high pain, after reading the pain narrative. Findings indicated that greater perspective-taking (not empathic concern) and perceiving the patient as in more severe pain were independently related to greater intention both to recommend and to provide treatment. Patient age and sex did not affect these outcomes.

Further, mediation analyses showed these relations to be more complex. Specifically, nursing students higher in empathic perspective-taking actually perceived the patient to be in more pain - even though all participants read the same patient pain narrative. Nursing students' perception of pain severity was, in turn, associated with their showing greater intention to recommend, as well as provide, pain treatment. As such, the present findings expand on previous research by demonstrating an important pathway: nurses higher on empathic perspective-taking have greater intention to not only recommend but also provide treatment to chronic pain patients in part because they recognize patients as being in greater pain (i.e., than do nursing students lower on empathic perspective-taking). Nursing students' trait personality also played a role: empathic perspective-taking was related to perceived patients' pain severity overall, but not for those with low levels of extroversion. This finding draws attention to catering nursing training to individuals with varying personalities who hope to enter the profession.

Study findings (Aim 1) support increased focus on empathic communication as central to training health professionals [1]. When nurses understand patients' feelings, it reduces patients' sense of aloneness and isolation, strengthening the alliance between nurse and patient [35]. Not surprisingly, patients are more likely to follow recommendations from health-care providers they trust [37]. The alliance generally fosters trust between the patient and the health care provider that is important in multiple ways: for patients to adhere to the recommended treatment, for patients to feel satisfied with the treatment, and for them to report positive treatment outcome [36]. Empathic nurse-patient interactions also tend to elicit greater exchange of health-related information, even sensitive or embarrassing information, from the patient. When patients share such information they provide nurses with the necessary knowledge to effectively intervene to reduce suffering [14].

Importantly, the study also elucidates a relevant although frequently overlooked point about empathy – its multidimensionality [38]. The cognitive aspect of empathy (i.e., perspective-taking) was found to be more relevant than the emotional component (i.e., empathic concern) in the current study. That is, nursing students good at putting themselves in the patient's shoes more directly understand the patient's physical experience (i.e., pain level). They can then use that information when making vital decisions, and taking action, to relieve patient pain (Study Aim 3). Thus, this cognitive inferencing (i.e., perspective-taking) about the patients' beliefs, wishes, and needs appears a critical aspect of empathy. It is conceptually different from more common connotations of empathy as largely involving showing warmth and sympathy for the patient [38,39].

Table 3
Results for the a-path from empathy-PT to pain severity and for the b-path from pain severity to IT – recommend treatment.

Variable	Model a-path			Model b/c'-path		
	b	SE	*p*	*b*	SE	*p*
Empathy-PT	.33	.04	< .001	.67	.15	< .001
Extraversion	-.00	.04	> .05			
Empathy-PT x Extraversion	.26	.10	< .05			
Pain severity				.24	.12	= .05

Note. Model for a-path $R^2 = .10$, F(3, 163) = 6.29, $p = .0005$. Model for b path and c path $R^2 = .15$, $F(2, 164) = 14.79$, $p < .001$. Empathy – PT = IRI perspective-taking subscale.

Table 4
Results for the a-path from empathy (i.e., perspective-taking) to pain severity and for the b-path from pain severity to IT – provide treatment.

Variable	Model b/c'-path		
	b	SE	*p*
Empathy	.42	.16	< .01
Extraversion			
Empathy x Extraversion			
Pain severity	.29	.13	< .05

Note. Model for b path and c path $R^2 = .09$, $F(2, 164) = 7.95$, $p = .0005$.

4.1. Nursing practice implications

The results beg the question: how do we strengthen perspective-taking in nursing education? Prior work suggests that nursing education has focused on behaviorally-based micro-skills training for learning to listen and respond to patients. Researchers are beginning to argue, however, that empathy should be taught less mechanically and more as a capacity based in self-other awareness (e.g., not just teach a technique but empathic understanding as well) [7]. In practice, this means that nursing training in perspective-taking should center on teaching future nurses to remain actively curious about the patient as an individual and to imagine what the patient may be experiencing emotionally and physically in addition to basic communication strategies. As already alluded to, student nurses tend to decrease in empathy as they gain more clinical experience [9] highlighting the importance of boosting empathy in the nursing school but also post-nursing school to provide optimal treatment conditions for patients.

Indeed, empathy is highly valued by patients, but they often identify it as lacking in relations with nursing staff [7]. Nurses often recognize patients' frustration, but the global, chronic shortage of nurses has taken a toll in healthcare settings: many nurses experience a heavy, stressful workload with multi-role responsibilities leaving insufficient time to provide empathic quality care [40]. On a positive note, the fact that patient age and sex did not significantly affect the outcomes (Study Aim 2) is an interesting observation indicating that nursing students are not showing ageistic or sex biases. Instead, they seem capable of maintaining an open, empathic mindset toward the patient and the treatment-related issue irrespective of age [18,19] and sex [20–22]. If replicated, this optimistic finding might even be communicated to patients, reducing their fears of facing bias in the health care systems. Nursing schools may also benefit from knowing that this bias does not seem as prevalent as one may fear. However, more research is needed across a variety of healthcare professionals moving beyond narrative vignettes and instead focusing on real patients.

Finally, related to Study Aim 4, our findings suggest that educational initiatives should be mindful of nursing students' unique personalities. Our results suggested that nursing students lower on extraversion, even if empathic, may not recognize patient's pain severity. Through role-play and individualized exercises, nursing education should help less extraverted students develop comfortable strategies for gaining a comprehensive picture of the patient's pain.

4.2. Study limitations

Despite the present study's strengths, some limitations should be noted that could threaten the validity, reliability, and internal consistency of the study. First, in interpreting the mediation analyses, given this cross-sectional design, we cannot be sure of the direction of relations between study variables (e.g., potential reciprocity between empathy, pain perception, and intention to treat). Moreover, the effect sizes were small in magnitude indicating that other variables explaining intention to treat should be considered in future studies. Second, although we carefully constructed the pain narrative, creating an ecologically valid patient scenario, nursing students could have received supplementary information on other clinical assessments, vital signs, and location of pain. To generalize these findings, study results should also be replicated in future research examining student nurses' empathic responding, pain perception and intention to treat in clinical and community settings with real patients from differing backgrounds (e.g., SES, race, ethnicity). Third, although we showed acceptable to good internal consistency in scale constructs, the novel Intention to Treat Scale was developed in collaboration with a health professional and should be validated and replicated in future studies. Relatedly, the reliability score for the well-known perspective taking scale was somewhat low, although deemed within the acceptable and reliable index [41]. Finally, our study sample was student nurses. This work could be replicated to assess whether the same pattern of findings appears with a more diverse sample of fully-trained, practicing nurses.

5. Conclusion

Empathy lies at the heart of what it means to provide quality nursing care. This study found that student nurses higher on empathy (i.e., perspective-taking) perceive patients as being in greater pain and correspondingly are more likely to recommend or provide treatment for the relief of suffering. This research also highlights variability in student nurses' personality and ways to encourage empathic perspective-taking in the service of maximizing quality care.

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CRediT authorship contribution statement

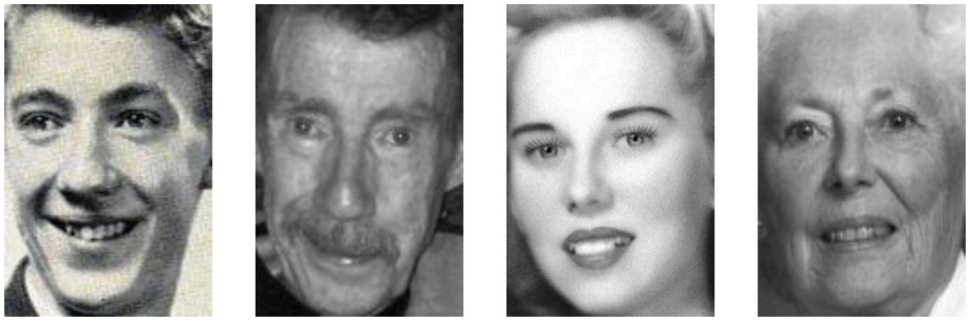
Mary Kate Koch: Writing – review & editing, Investigation. **Susan Bluck:** Writing – review & editing, Supervision, Project administration. **Majse Lind:** Writing – original draft, Visualization, Formal analysis, Conceptualization.

Declaration of Competing Interest

The authors have no conflict of interest.

Appendix

Title: Images of patient in pain: male 25 years old and 85 years old, female 25 years old and 85 years old



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