

## Research article

# Relationships among active listening, self-awareness, empathy, and patient-centered care in associate and baccalaureate degree nursing students



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## ABSTRACT

**Objective:** The purpose of this research was to examine the relationships among active listening, self-awareness, empathy, and patient-centered care in nursing students.

**Background:** Empathy and patient-centered care have been associated with better patient outcomes. Active listening and self-awareness are suggested to be associated with empathy, and, in turn, patient-centered care. However, the relationships among active listening, self-awareness, empathy, and patient-centered care have not been investigated.

**Method:** Data on active listening, self-awareness, empathy, and patient-centered care were collected from 53 nursing students, and were analyzed using multiple regression.

**Results:** Active listening ( $p < .001$ ) and self-awareness ( $p < .001$ ) were significantly associated with empathy. Empathy was significantly associated with patient-centered care ( $p = .003$ ). Empathy was a partial mediator of the relationship between active listening and PCC and a full mediator of the relationship between self-awareness and patient-centered care.

**Conclusion:** Improvement in active listening and self-awareness may lead to improvement in empathy, and, in turn, improvement in patient-centered care.

## 1. Introduction

Patient-centered care (PCC) is healthcare that is specific to the patient's needs and desires (Weiner et al., 2013). To explore the patient's needs and desires, a healthcare provider (HCP) needs to share, care, communicate, and develop a therapeutic relationship with the patient (Rogers, 1951, 1979). These are the four main characteristics of PCC. These characteristics are critical for a HCP to understand a patient's experience and deliver care based on this understanding (Raja et al., 2015; Rogers, 1959). PCC may make the patient feel listened to, respected, and understood (Raja et al., 2015). PCC has been associated with better patient outcomes. For example, researchers report that PCC has been associated with better self-management of hemoglobin A1C, blood pressure, and weight control (Rocco, Scher, Basberg, Yalamanchi, & Baker-Genaw, 2011; Weiner et al., 2013). In addition, PCC has been associated with higher patient satisfaction with care (Evans, Watts, & Gratton, 2015; Knier, Stichler, Ferber, & Catterall, 2015) and lower mortality rates (Meterko, Wright, Lin, Lowy, & Cleary,

2010). Thus, the delivery of PCC is critical for better patient outcomes. To facilitate the delivery of PCC, it will be beneficial to determine modifiable factors affecting PCC.

Rogers (1959) Patient-Centered theory, also called client-centered and person-centered approach, suggested several modifiable factors affecting PCC (Fig. 1). In the theory, Rogers suggested that empathy affects PCC, and active listening and self-awareness affect empathy (Rogers, 1951). Rogers defined empathy as the ability to recognize, understand, and share a patient's experience (Rogers, 2007). According to Rogers, empathy has cognitive and affective characteristics. The relationship between empathy and PCC suggested by the theory has been supported in some studies (Jones & Huggins, 2014; Mercer, Neumann, Wirtz, Fitzpatrick, & Vojt, 2008; Neumann et al., 2007), even though the PCC instruments did not reflect all the four characteristics of PCC. For example, researchers reported that dentists' empathy was associated with better communication between dentists and their patients (Jones & Huggins, 2014). Other researchers reported that if HCPs showed more empathy, their patients felt more enabled, which

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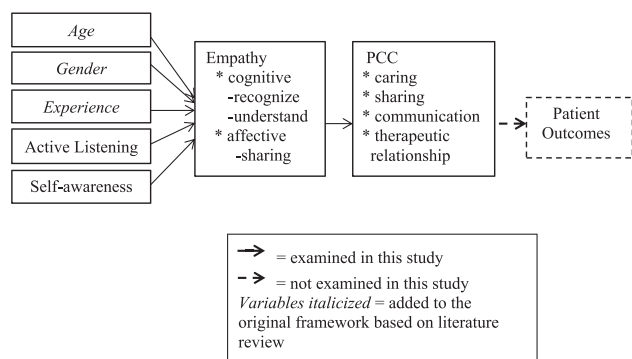


Fig. 1. Theoretical Framework: Modified Model of Rogers' Patient-Centered Theory.

indicated a better therapeutic relationship (Mercer et al., 2008). In another study, Neumann et al. (2007) reported that if a patient perceived higher levels of empathy from his/her HCP, then, he or she perceived more caring and a better therapeutic relationship with the HCP. While these findings support the relationship between empathy and PCC, PCC in these studies reflected only a few of the four characteristics. Thus, it will be beneficial to examine the relationship between empathy and PCC using an instrument that measures all the characteristics of PCC.

Empathy also affects patient outcomes as well as PCC (Rogers, 2007). In some studies, higher levels of empathy in HCPs were associated with lower levels of hemoglobin A1C and cholesterol (Hojat et al., 2011), higher patient satisfaction (Menendez, Chen, Mudgal, Jupiter, & Ring, 2015), and shorter illness periods (Rakel et al., 2009). Rogers' theory and the findings of the studies cited show the importance of empathy in HCPs. Nurses are HCPs who spend the most time with patients (Westbrook, Duffield, Li, & Creswick, 2011), therefore, it is important for nurses to have optimal levels of empathy. Nursing students are future nurses, so it is imperative that they have appropriate levels of empathy. However, the literature shows suboptimal levels of empathy in nursing students, and levels of empathy in nursing students were lower compared to those in other healthcare disciplines (McKenna et al., 2012; Schweller, Costa, Antônio, Amaral, & de Carvalho-Filho, 2014; Williams, Brown, Boyle et al., 2014; Williams, Brown, McKenna et al., 2014). Thus, empathy may need to be improved in nursing students. To improve empathy effectively, modifiable factors affecting empathy need to be examined.

Rogers (2007) suggested active listening and self-awareness as modifiable factors affecting empathy. Active listening was defined as the inner process of deciding whether listening to what another person said provided insight to self-emotions and feelings (Arnold, 2014), which may help develop empathy (Rogers, 2007). Some research findings support this relationship. For example, listening to a patient may lead a HCP to develop empathy, and, in turn, develop a therapeutic relationship between the two, which is one characteristic of PCC (King et al., 2015). Rogers believed self-awareness was another modifiable factor affecting empathy. He defined self-awareness as understanding the self, allowing one to express attitudes and beliefs toward other people (Rogers, 2007). In addition, self-awareness may develop the capacity to self-evaluate one's morals and become non-judgmental, which may help develop empathy (Rogers, 1975). Research findings support this relationship. For example, gaining self-awareness helped nursing students develop empathy (Waite & McKinney, 2016). As a result of gaining active listening and self-awareness, level of empathy may improve. The improvement in empathy may then, help the nurse focus on delivering care specific to what the patient needs, which is PCC (Rogers, 1979). Thus, these relationships suggest mediator effects of empathy on the relationship of active listening and self-awareness to PCC. However, the mediator effects of empathy on the relationships have not been examined.

We added age, gender, and experience to Rogers' theory because some literature suggests that they are factors associated with empathy. For example, older adults are thought to have more empathy than younger adults do (Pitt, Powis, Levett-Jones, & Hunter, 2014; Williams, Brown, & McKenna, 2014; Williams, Brown, Boyle et al., 2014). In addition, females tend to have higher levels of empathy than males (Berg et al., 2015; Leombruni et al., 2014; Pitt et al., 2014; Williams, Brown, & McKenna, 2014), and more personal and work experience with patients tend to produce higher levels of empathy (Chen, Kiersma, Yehle, & Plake, 2015). Therefore, the purpose of this study was to examine the relationships among active listening, self-awareness, empathy, and PCC in associate of applied science in nursing (AASN) and baccalaureate of science in nursing (BSN) degree students, controlling for age, gender, and experience. Specific aim 1 was to examine the relationship of active listening and self-awareness to empathy, controlling for age, gender, and experience. Specific aim 2 was to examine the relationship of active listening, self-awareness, and empathy to PCC, controlling for age, gender, and experience. Specific aim 3 was to examine the mediator effect of empathy on the relationship between active listening and PCC. Specific aim 4 was to examine the mediator effect of empathy on the relationship between self-awareness and PCC.

## 2. Method

This was a cross-sectional study to examine the relationships among active listening, self-awareness, empathy, and patient-centered care in nursing students. We used the baseline data from a parent study, which was a two-arm randomized controlled trial (RCT) investigating the effects of a simulation with audio narrative intervention on active listening, self-awareness, empathy, and PCC. We conducted the parent study during the spring semester in 2016 at a rural university in a southern city in the United States with nursing students. Recruitment and baseline data collection in the parent study started after approval was obtained from the university's Institutional Review Board.

### 2.1. Sample

We calculated the sample size for the parent RCT (N = 53) based on Lor, Truong, Ip, & Barnett et al. (2015) study, which used a RCT study design, and examined the effects of using a simulation intervention on levels of empathy among 40 pharmacy students. In the parent study, we used a convenience sample (N = 53) of junior (n = 25) and senior (n = 28) academic rank nursing students from the AASN (n = 8) and BSN (n = 45) programs. Students were included if they were currently enrolled in the university's nursing programs. Students were excluded if they self-reported having hearing impairment or an English language barrier. Participation in the study was strictly voluntary without college credit or course grades/points offered for participating.

We calculated the sample size for the current study based on the Fields et al. study (2011). Even though some studies have examined the relationships among active listening, self-awareness, empathy, and PCC, no retrievable study provided information about determining effect size calculation (e.g., mean scores with standard deviation [SD] or correlational coefficients). However, in Fields, Tillman, Harris, Maxwell, and Hojat (2011) study, each of the relationships between gender and empathy and between age and empathy showed a medium effect size. In the current cross-sectional study, we had five independent variables of empathy, including age, gender, experience, active listening, and self-awareness. Thus, we expected an effect size of .25 (a midpoint of .15 medium effect size and .35 large effect size). Considering an effect size of .25, a two-sided significance level of .05, power .80, and number of predictors 5, the expected sample size was 58. Sample size calculation was done using the software PASS 14 (PASS 14 Power Analysis & Sample Size Software, 2015).

2.2. Measures

2.2.1. Active Listening

The Active Empathic Listening Scale (AELS) assesses active listening and consists of 11 self-assessment items using a seven-point Likert-type scale, where 1 is *never or almost never true* up to 7 *always or almost always true* (Gearhart & Bodie, 2011). Scores range from 11 to 77, with higher scores indicating higher levels of active listening (Bodie, 2011). Cronbach’s alphas were from .86 to .94 in college students, supporting reliability (Bodie, 2011; Gearhart & Bodie, 2011). Cronbach’s alpha in the current study was .89. Validity was also supported by factor analysis, where the loadings for all items were greater than .45 (Bodie, 2011).

2.2.2. Self-awareness

The Self-Consciousness Scale-Revised (SCS-R) assesses self-awareness. The name of the scale “Self-consciousness” suggests self-awareness, which allows an individual to reflect on their hidden features of self-thoughts, feelings, and beliefs (DaSilveira, DeSouza, & Gomes, 2015). The SCS-R consists of 22 self-assessment items using a three-point Likert-type scale, where 0 is *not like me at all* up to 3 *a lot like me*. Total scores range from 0 to 66, with higher scores indicating higher levels of self-awareness. Cronbach’s alpha was .73, and test-retest reliability coefficient was .89 in young adults, supporting reliability (DaSilveira et al., 2015). Cronbach’s alpha in the current study was .91. Validity was also supported by factor analysis, where loadings for all items were greater than .45 (DaSilveira et al., 2015).

2.2.3. Empathy

The Kiersma Chen Empathy Scale (KCES) assesses empathy. The KCES consists of 15 self-assessment items using a seven-point Likert-type scale, where 1 is *strongly disagree* up to 7 *strongly agree* (Kiersma, Chen, Yehle, & Plake, 2013). Total scores range from 15 to 105, with higher scores indicating higher levels of empathy (Kiersma et al., 2013). Cronbach’s alpha was greater than .80 in nursing students (Kiersma et al., 2013), supporting reliability. Cronbach’s alpha in the current study was .87. Validity was supported by factor analysis, where the correlational coefficient between cognitive and affective factors was .98 ( $p < .001$ ). Empathy assessed by the KCES was also associated with empathy assessed by the Jefferson Scale of Empathy-Healthcare Provider Student version at baseline and at post-intervention (baseline  $r = .594, p < .001$  and post-test  $r = .770, p < .001$ ), indicating acceptable criterion validity (Kiersma et al., 2013).

2.2.4. Patient-centered care

The Patient-Practitioner Orientation Scale (PPOS) assesses PCC and consists of 18 self-assessment items using a six-point Likert-type scale, where 6 is *strongly disagree* and 1 *strongly agree* (Krupat et al., 2000). The PPOS measures all four characteristics of PCC (caring, sharing, communication, and therapeutic relationship). Total scores range from 18 to 108, with higher scores indicating higher levels of PCC (Ahmad et al., 2015). Cronbach’s alpha was .73 in HCPs (Krupat et al., 2000), supporting reliability. Cronbach’s alpha in the current study was .92. Validity was also supported in HCPs from Rater Interaction Analysis, showing HCP scores predicted patient-provider variations in communication ( $p = .03$ ) (Shaw, Woiszwilllo, & Krupat, 2012). With the developer’s permission, we changed the term “doctor” to “healthcare professional,” making the instrument more applicable to our population of nursing students.

2.3. Procedure

In the parent study, recruitment of students took place three times because each cohort of students from the BSN Junior class, BSN Senior class, and AASN class were on campus at different times during the week. The principal investigator (PI) recruited students in a private classroom in the university’s school of nursing. Before the PI entered the classroom, the faculty of each cohort informed students that the PI would visit the classroom after the lecture to explain this study and told them, if they were interested in the study, they might stay in the classroom.

The PI began the recruitment process with each cohort by distributing a study information sheet to each student. The sheet contained the study description, inclusion and exclusion criteria, intervention specifics, total time commitments, and PI contact information. Next, the PI distributed a folder to each student that contained the same study information sheet, and asked those who were interested in participating to please sign the sheet, and include their student email. Signing the information sheet served as written consent for participation. After collecting all folders, the PI screened the signed information sheets for eligibility and then assigned a unique study identification number to each eligible student. One week later, the PI met with each cohort in the same classroom, in which recruitment occurred to collect student self-reported characteristics, such as student age, gender, work experience (any prior work experience with patients), ethnicity, nursing licensure type (if any), academic rank, and program of study using a student information sheet. In addition, baseline data collection of active

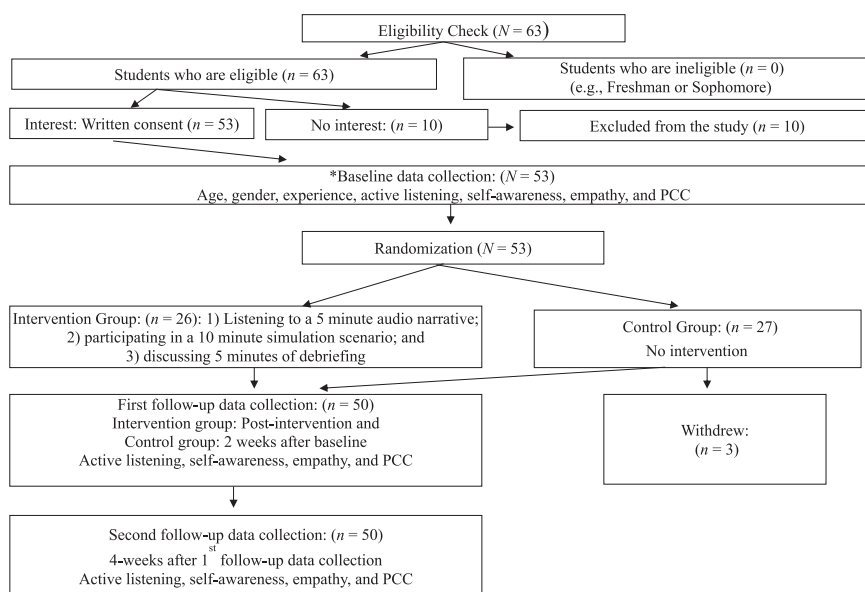


Fig. 2. CONSORT Flow Diagram for the parent study (Randomized Controlled Trial). \*Data from baseline data collection was used in this study.

listening, self-awareness, empathy, and PCC was completed by each student using a Blackboard ([www.blackboard.com](http://www.blackboard.com)) course shell. The study's procedure is outline in Fig. 2 (CONSORT, 2010).

#### 2.4. Data analysis

Descriptive statistics, including means ( $\pm$  SD) and frequencies (percentages), were used to describe the status of active listening, self-awareness, empathy, and PCC and demographic characteristics of the sample. Multicollinearity was tested, and no variables showed a variance inflation factor greater than 10 (Mertler & Vannatta, 2013). To address specific aim 1, we used multiple regression to examine if active listening and self-awareness were related to empathy, controlling for age, gender, and work experience. To address specific aim 2, we used multiple regression to examine if active listening, self-awareness, and empathy were related to PCC, controlling for age, gender, and work experience. To address specific aims 3 and 4, similar analyses using simple and multiple regression were performed (Bennett, 2000). We looked at the mediator effects of empathy on the relationship between active listening and PCC, and on the relationship between self-awareness and PCC, without controlling for age, gender, or work experience. We used males and students without work experience as the reference groups. All tests conducted were two-sided and  $p$  values less than .05 were considered statistically significant. All analyses were done using SPSS V 22 (Armonk, NY).

### 3. Results

There were 63 eligible students, and 53 volunteered for the current study. The majority of participants were aged 19–23 (55%), female (85%), and Caucasian (72%) (Table 1). The majority did not hold a

**Table 1**  
Sample Characteristics (N = 53).

Characteristics	N (%)	$p$ value
Age (years)		.669
19–23	29 (54.7)	
24–28	10 (18.9)	
29–39	10 (18.9)	
40 or older	4 (7.5)	
Gender		1.000
Male	8 (15.1)	
Female	45 (84.9)	
Ethnicity		.407
African American	13 (24.5)	
Caucasian	38 (71.7)	
Other	2 (3.8)	
Holds a current nursing license		.691
No	40 (75.5)	
Yes	13 (24.5)	
Licensed Practical Nurse	12 (92.3)	
Registered Nurse	1 (7.7)	
Work experience		.865
No	21 (39.6)	
Yes	32 (60.4)	
Hospital	16 (50.0)	
Nursing home	13 (40.6)	
Health clinic/Physician's office	2 (6.3)	
Other	1 (3.1)	
Program of study		.704
Associate	8 (15.1)	
Baccalaureate	45 (84.9)	
Academic rank		.685
Junior	25 (47.2)	
Senior	28 (52.8)	
Active listening baseline, Mean (SD)	63.1 (6.6)	
Self-awareness baseline, Mean (SD)	53.7 (7.4)	
Empathy baseline, Mean (SD)	73.4 (5.4)	
Patient-centered care baseline, Mean (SD)	73.6 (10.3)	

Note. N = number. SD = standard deviation.

current nursing license (76%), had work experience in a healthcare setting (60%), and were in the BSN program (85%). The mean scores ( $\pm$  SD) of the main variables were the following: active listening: 63.1 ( $\pm$  6.6), self-awareness: 53.7 ( $\pm$  7.4), empathy: 73.4 ( $\pm$  5.4), and PCC: 73.6 ( $\pm$  10.3).

#### 3.1. Associates of empathy and patient-centered care

In multiple regression analysis, higher levels of active listening and self-awareness were significantly associated with higher level of empathy, controlling for covariates of age, gender, and work experience (active listening,  $p < .001$ ; self-awareness,  $p < .001$ , Table 2). None of the covariates were significantly associated with empathy. In multiple regression analysis, higher level of empathy was significantly associated with higher level of PCC, controlling for covariates of age, gender, and work experience ( $p = .003$ ). Active listening and self-awareness were not significantly associated with PCC. Among the covariates of age, gender, and work experience, only work experience was significantly associated with PCC ( $p = .037$ ). Those students who did not have work experience were the reference group. Therefore, those students with more work experience had higher level of PCC.

#### 3.2. Mediator effects of empathy

We tested mediator effects of empathy using four steps of simple and multiple regression analyses without controlling for covariates. We first tested the mediator effect of empathy on the relationship between active listening and PCC. The first simple regression analysis showed that higher level of active listening was significantly associated with higher level of empathy ( $\beta = .72$ ,  $p < .001$ ) (Fig. 3). The second simple regression analysis showed that higher level of empathy was significantly associated with higher level of PCC ( $\beta = .66$ ,  $p < .001$ ). The third simple regression analysis showed that higher level of active listening was significantly associated with higher level of PCC ( $\beta = .63$ ,  $p < .001$ ). The fourth multiple regression analysis showed that when empathy was added to the third model, the significance level of active listening was considerably decreased from  $p < .001$  to  $p = .031$ , indicating a partial mediator effect of empathy on the relationship between active listening and PCC.

To assess the mediator effect of empathy on the relationship between self-awareness and PCC, we conducted the same steps of simple and multiple regression analyses. The first simple regression analysis showed that higher level of self-awareness was significantly associated with higher level of empathy ( $\beta = .72$ ,  $p < .001$ ) (Fig. 4). The second simple regression analysis showed that higher level of empathy was significantly associated with higher level of PCC ( $\beta = .66$ ,  $p < .001$ ). The third simple regression analysis showed that higher level of self-awareness was significantly associated with higher level of PCC ( $\beta = .45$ ,  $p = .001$ ). The fourth multiple regression analysis showed that when empathy was added to the third model, self-awareness was no longer significantly associated with PCC ( $\beta = -.05$ ,  $p = .768$ ), indicating a full mediator effect of empathy on the relationship between self-awareness and PCC.

### 4. Discussion

The findings of the current study showed some modifiable factors of empathy and PCC based on the revised Rogers' theory. Active listening and self-awareness were factors associated with empathy, and experience and empathy were factors associated with PCC. Even though the full model of the revised Rogers' theory could not be tested, the findings imply the mediator effects of empathy. Empathy was a mediator of the relationships between active listening and PCC and between self-awareness and PCC. This is the first study examining the relationship among active listening, self-awareness, empathy, and PCC based on Rogers' theory, even though the full model could not be tested.

**Table 2**  
Factors Associated with Empathy and Patient-Centered Care: Multiple Regression (N = 53).

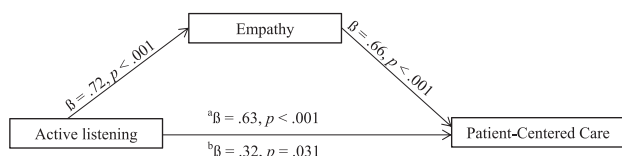
	Empathy					Patient-Centered Care				
	B	Beta	t-test	95% CI	p value	B	Beta	t-test	95% CI	p value
Active Listening	.347	.465	4.912	.205, .489 <sup>†</sup>	.000	.286	.203	1.359	-.137, .709	.181
Self-awareness	.365	.492	4.929	.216, .514 <sup>†</sup>	.000	-.217	-.155	-.983	-.661, .227	.331
Empathy	N/A		N/A	N/A		1.128	.599	3.193	.417, 1.838 <sup>†</sup>	.003
Age	1.767	.163	1.547	-.531, 4.065	.129	-2.035	-.100	-.718	-7.741, 3.672	.477
Gender	-2.482	-.165	-1.983	-5.001, .036	.053	5.982	.211	1.896	-.369, 12.333	.064
Experience	-1.699	-.154	-1.566	-3.881, .483	.124	5.781	.278	2.146	.359, 11.203 <sup>†</sup>	.037

B = unstandardized coefficient. CI = confidence interval.

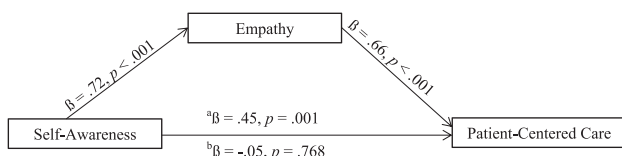
N = number. N/A = not applicable to the model.

<sup>†</sup> p < .001 used for significance.

\* p < .05 used for significance.



**Fig. 3.** Mediator Effect of Empathy on the Relationship between Active Listening and Patient-Centered Care. *Note.* <sup>a</sup> = Relationship between active listening and patient-centered care. <sup>b</sup> = Relationship between active listening and patient-centered care when empathy was added. β = Beta, standardized coefficient.



**Fig. 4.** Mediator Effect of Empathy on the Relationship between Self-Awareness and Patient-Centered Care. *Note.* <sup>a</sup> = Relationship between self-awareness and patient-centered care. <sup>b</sup> = Relationship between self-awareness and patient-centered care when empathy was added. β = Beta, standardized coefficient.

Rogers’ (1951) theory suggests that active listening and self-awareness lead to empathy, which leads to PCC, but no study has tested the relationships among all the four variables. In addition, there were no retrievable studies that examined the relationships among active listening, self-awareness, and empathy. The findings of the current study support the relationship of active listening and self-awareness to empathy in Rogers’ theory. Therefore, active listening and self-awareness can be the targets of interventions to improve levels of empathy.

The findings of the current study also support the relationship between empathy and PCC, which Rogers’ theory suggests. Based on Rogers’ definition of PCC (Rogers, 1951), we measured PCC using an instrument that measured the four main characteristics of PCC, which are caring, sharing, communication, and therapeutic relationship. Even though previous research findings align with the findings of the current study, and support the relationship between empathy and PCC (Mercer et al., 2008; Neumann et al., 2007; Price, Mercer, & MacPherson, 2006), PCC in those studies was not defined clearly, or reflected only one characteristic of PCC. For example, other researchers examined the relationship between empathy and communication (Jones & Huggins, 2014), therapeutic relationship (Mercer et al., 2008; Price et al., 2006), or caring (Neumann et al., 2007). Therefore, the findings of the current study provide valuable information about the relationship between empathy and PCC using instruments reflecting the definitions of Rogers’ theory.

Further, the findings of the current study support that empathy was a partial mediator on the relationship between active listening and PCC, and a full mediator on the relationship between self-awareness and PCC. Even though Rogers suggested these relationships, no studies have examined them. The findings of the current study imply that active

listening and self-awareness are associated with PCC directly and also through the effects on empathy. Therefore, interventions that target improvement in active listening and self-awareness may result in improvement in empathy, which, in turn, leads to improvement in PCC. However, in the current study, the comprehensive direct and indirect relationships among all the variables in the model could not be tested using a model, such as structural equation modeling, due to the relatively small sample. Future studies with larger samples are needed to test the comprehensive relationships among all the variables in one model.

The empathy score in the current study was 73.45 out of 105, which was lower than mean empathy scores assessed by the KCES among other nursing students (89.15) (Chen et al., 2015). The mean empathy scores in the current study might be lower due to inclusion of junior nursing students who were in their second semester of major coursework and had not had much clinical experience (Chen et al., 2015). For example, in Chen et al. (2015) study and the current study, self-reported experience was associated with higher mean empathy scores. Therefore, nurse educators need to teach nursing students how to improve active listening and self-awareness to improve their levels of empathy.

Improvement in empathy is vital because empathy is linked to delivering PCC and patient outcomes. For example, Jones and Huggins (2014) report that empathy may increase communication between patients and their HCPs, and was positively associated with better adherence to self-management, higher levels of satisfaction, and lower levels of anxiety in patients. Improvement in PCC is also important because PCC also was linked to patient outcomes. For instance, PCC was associated with better control of blood pressure and medication adherence (Weiner et al., 2013), and better patient satisfaction (Evans et al., 2015). Therefore, we should investigate innovative ways to engage students in improving their empathy, which could lead to delivery of PCC, with an ultimate goal of improving patient outcomes.

#### 4.1. Limitations

Some limitations of the current study were a small sample from one university setting and only using registered nursing degree-seeking students, which limit the generalizability of the findings of the current study. Another limitation was the inability to examine the comprehensive direct and indirect relationships among all the variables as a model due to our small sample. For example, structural equation modeling can show the comprehensive direct and indirect relationships among all the variables in one model. However, we could not use it because of insufficient sample size to use structural equation modeling. Lastly, a limitation was using a cross-sectional study design, limiting the examination of cause-effect relationships among the variables. Thus, future studies including multiple sites and all nursing degree-seeking students may be needed. In addition, testing the full model in larger samples with rigorous study designs would be beneficial.

## 5. Conclusion

The findings of the current study suggest that if nursing students can incorporate active listening and becoming self-aware into their practice, this may increase their empathy and, in turn, increase PCC. Future studies are needed to develop and deliver interventions aimed at increasing active listening and self-awareness, and to test whether improvement in active listening and self-awareness increases empathy and, in turn, increases PCC.

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## References

- Ahmad, W., Krupat, E., Asma, Y., Fatima, N. E., Attique, R., Mahmood, U., & Waqas, A. (2015). Attitudes of medical students in Lahore, Pakistan towards the doctor-patient relationships. *Peer Journal*, 3(e1050), 1–10. <http://dx.doi.org/10.7717/peerj.1050>.
- Arnold, K. (2014). Behind the mirror: Reflective listening and its tain in the work of Carl Rogers. *The Humanistic Psychology*, 42(4), 354–369. <http://dx.doi.org/10.1080/08873267.2014.913247>.
- Bennett, J. A. (2000). Mediator and moderator variables in nursing research: Conceptual and statistical differences. *Research in Nursing & Health*, 23, 415–420.
- Berg, K., Blatt, B., Lopreiato, J., Jung, J., Schaeffer, A., Heil, D., & Hojat, M. (2015). Standardized patient assessment of medical student empathy: Ethnicity and gender effects in a multi-institutional study. *Academic Medicine*, 90(1), 105–111. <http://dx.doi.org/10.1097/ACM.0000000000000529>.
- Bodie, G. D. (2011). The active-empathic listening scale (AELS): Conceptualization and evidence of validity within the interpersonal domain. *Communication Quarterly*, 59(3), 277–295. <http://dx.doi.org/10.1080/01463373.2011.583495>.
- Chen, A. M., Kiersma, M. E., Yehle, K. S., & Plake, K. S. (2015). Impact of the geriatric medication game(R) on nursing students' empathy and attitudes toward older adults. *Nurse Education Today*, 35(1), 38–43. <http://dx.doi.org/10.1016/j.nedt.2014.05.005>.
- CONSORT (2010). CONSORT: Transparent reporting of trials. Retrieved from [www.consort-statement.org](http://www.consort-statement.org).
- DaSilveira, A., DeSouza, M. L., & Gomes, W. B. (2015). Self-consciousness concept and assessment in self-report measures. *Frontiers in Psychology*, 6(930), 1–11. <http://dx.doi.org/10.3389/fpsyg.2015.00930>.
- Evans, M. K., Watts, N., & Gratton, R. (2015). Women's satisfaction with obstetric triage services. *Journal of Obstetric, Gynecologic, & Neonatal Nursing*, 44(6), 693–700. <http://dx.doi.org/10.1111/1552-6909.12759>.
- Fields, S. K. M., Tillman, P., Harris, P., Maxwell, J., & Hojat, M. K. (2011). Measuring empathy in healthcare profession students using the Jefferson Scale of physician empathy: Health provider – Student version. *Journal of Interprofessional Care*, 25(4), 287–293. <http://dx.doi.org/10.3109/13561820.2011.566648>.
- Gearhart, C. C., & Bodie, G. D. (2011). Active-empathetic listening as a general social skill: Evidence from bivariate and canonical correlations. *Communication Reports*, 24(2), 86–98. <http://dx.doi.org/10.1080/08934215.2011.610731>.
- Hojat, M., Louis, D. Z., Markham, F. W., Wender, R., Rabinowitz, C., & Gonnella, J. S. (2011). Physicians' empathy and clinical outcomes for diabetic patients. *Academic Medicine*, 86(3), 359–364. <http://dx.doi.org/10.1097/ACM.0b013e3182086f1e>.
- Jones, L. M., & Huggins, T. J. (2014). Empathy in the dentist-patient relationship: Review and application. *The New Zealand Dental Journal*, 110(3), 98–104.
- Kiersma, M. E., Chen, A. M. H., Yehle, K. S., & Plake, K. S. (2013). Psychometric testing of the Kiersma-Chen empathy scale. *American Journal of Pharmaceutical Education*, 77(5), Article 94.
- King, P., Cederbaum, J., Kurzban, S., Norton, T., Palmer, S., & Coyne, J. (2015). Role of patient treatment beliefs and provider characteristics in establishing patient-provider relationships. *Family Practice*, 32(2), 224–231. <http://dx.doi.org/10.1093/fampra/cmu085>.
- Knier, S., Stichler, J. F., Ferber, L., & Catterall, K. (2015). Patients' perceptions of the quality of discharge teaching and readiness for discharge. *Rehabilitation Nursing*, 40(1), 30–39. <http://dx.doi.org/10.1002/rnj.164>.
- Krupat, E., Rosenkranz, S. L., Yeager, C. M., Barnard, K., Putnam, S. M., & Inui, T. S. (2000). The practice orientations of physicians and patients: The effect of doctor-patient congruence on satisfaction. *Patient Education and Counseling*, 39(1), 49–59.
- Lor, K. B., Truong, J. T., Ip, E. J., & Barnett, M. J. (2015). A randomized prospective study on outcomes of an empathy intervention among second-year student pharmacists. *American Journal of Pharmaceutical Education*, 79(2), 1–4. <http://dx.doi.org/10.5688/ajpe79218>.
- McKenna, L., Boyle, M., Brown, T., Williams, B., Molloy, A., Lewis, B., & Molloy, L. (2012). Levels of empathy in undergraduate nursing students. *International Journal of Nursing Practice*, 18(3), 246–251. <http://dx.doi.org/10.1111/j.1440-172X.2012.02035.x>.
- Menendez, M. E., Chen, N. C., Mudgal, C. S., Jupiter, J. B., & Ring, D. R. (2015). Physician empathy as a driver of hand surgery patient satisfaction. *Journal of Hand Surgery in America*, 40(9), 1860–1865. <http://dx.doi.org/10.1016/j.jhsa.2015.06.105>.
- Mercer, S. W., Neumann, M., Wirtz, M., Fitzpatrick, B., & Vojt, G. (2008). General practitioner empathy, patient enablement, and patient-reported outcomes in primary care in an area of high socio-economic deprivation in Scotland—A pilot prospective study using structural equation modeling. *Patient Education and Counseling*, 73(2), 240–245. <http://dx.doi.org/10.1016/j.pec.2008.07.022>.
- Mertler, C. A., & Vannatta, R. A. (2013). *Advanced and multivariate statistical methods (Multiple Regression)* (5th ed.). Glendale, CA: Pyrczak Publishing.
- Meterko, M., Wright, S., Lin, H., Lowy, E., & Cleary, P. D. (2010). Mortality among patients with acute myocardial infarction: The influences of patient-centered care and evidence-based medicine. *Health Services Research*, 45(5), 1188–1204. <http://dx.doi.org/10.1111/j.1475-6773.2010.01138.x>.
- Neumann, M., Wirtz, M., Bollschweiler, E., Mercer, S. W., Warm, M., Wolf, J., & Pfaff, H. (2007). Determinants and patient-reported long-term outcomes of physician empathy in oncology: A structural equation modelling approach. *Patient Education and Counseling*, 69(1–3), 63–75. <http://dx.doi.org/10.1016/j.pec.2007.07.003>.
- PASS 14 Power Analysis and Sample Size Software (2015). NCSST, LLC. Kaysville, Utah, USA, ncss.com/software/pass.
- Pitt, V., Powis, D., Levett-Jones, T., & Hunter, S. (2014). Nursing students' personal qualities: A descriptive study. *Nurse Education Today*, 34(9), 1196–1200. <http://dx.doi.org/10.1016/j.nedt.2014.05.004>.
- Price, S., Mercer, S. W., & MacPherson, H. (2006). Practitioner empathy, patient enablement and health outcomes: A prospective study of acupuncture patients. *Patient Education and Counseling*, 63, 239–245. <http://dx.doi.org/10.1016/j.pec.2005.11.006>.
- Raja, S., Hasnain, M., Vadakumchery, T., Hamad, J., Shah, R., & Hoersch, M. (2015). Identifying elements of patient-centered care in underserved populations: A qualitative study of patient perspectives. *PLoS One*, 10(5), e0126708. <http://dx.doi.org/10.1371/journal.pone.0126708>.
- Rakel, D. P., Hoeff, T. J., Barrett, B. P., Chewing, B. A., Craig, B. M., & Niu, M. (2009). Practitioner empathy and the duration of the common cold. *Clinical Research and Methods*, 41(7), 494–501.
- Rocco, N., Scher, K., Basberg, B., Yalamanchi, S., & Baker-Genaw, K. (2011). Patient-centered plan-of-care tool for improving clinical outcomes. *Quality Management in Health Care*, 20(2), 89–97. <http://dx.doi.org/10.1097/QMH.0b013e318213e728>.
- Rogers, C. (1959). *Psychology: A study of science*. New York: McGraw-Hill.
- Rogers, C. R. (1951). *Client-centered therapy: Its current practice, implications, and theory*. Boston: Houghton Mifflin Company.
- Rogers, C. R. (1975). Empathetic: An unappreciated way of being. *The Counseling Psychologist*, 5, 1–10.
- Rogers, C. R. (1979). The foundations of the person-centered approach. *Education*, 100(2), 98–107.
- Rogers, C. R. (2007). The necessary and sufficient conditions of therapeutic personality change. *Psychotherapy: Theory, Research, Practice, Training*, 44(3), 240–248. <http://dx.doi.org/10.1037/0033-3204.44.3.240>.
- Schweller, M., Costa, F. O., Antônio, M. A., Amaral, E. M., & de Carvalho-Filho, M. A. (2014). The impact of simulated medical consultations on the empathy levels of students at one medical school. *Academic Medicine: Journal of the Association of American Medical Colleges*, 89(4), 632–637. <http://dx.doi.org/10.1097/ACM.000000000000175>.
- Shaw, W. S., Woiszwilllo, M. J., & Krupat, E. (2012). Further validation of the Patient-Practitioner Orientation Scale (PPOS) from recorded visits for back pain. *Patient Education and Counseling*, 89(2), 288–291. <http://dx.doi.org/10.1016/j.pec.2012.07.017>.
- Waite, R., & McKinney, N. S. (2016). Capital we must develop: Emotional competence educating pre-licensure nursing students. *Nursing Education Perspectives*, 37(2), 101–103.
- Weiner, S. J., Schwartz, A., Sharma, G., Binns-Calvey, A., Ashley, N., Kelly, B., & Harris, I. (2013). Patient-centered decision making and health care outcomes: An observational study. *Annals of Internal Medicine*, 158(8), 573–579. <http://dx.doi.org/10.7326/0003-4819-158-8-201304160-00001>.
- Westbrook, J., Duffield, C., Li, L., & Creswick, N. J. (2011). How much time do nurses have for patients? A longitudinal study quantifying hospitals nurses' patterns of task time distribution and interactions with health professionals. *Biomed Central Health Services Research*, 11, 319. <http://dx.doi.org/10.1186/1472-6963-11-319>.
- Williams, B., Brown, T., Boyle, M., McKenna, L., Palermo, C., & Etherington, J. (2014). Levels of empathy in undergraduate emergency health, nursing, and midwifery students: A longitudinal study. *Advances in Medical Education and Practice*, 5, 299–306. <http://dx.doi.org/10.2147/AMEP.S66681>.
- Williams, B., Brown, T., McKenna, L., Boyle, M. J., Palermo, C., Nestel, D., & Russo, V. (2014). Empathy levels among health professional students: A cross-sectional study at two universities in Australia. *Advances in Medical Education and Practice*, 5, 107–113. <http://dx.doi.org/10.2147/AMEP.S5756>.