Comparing Nurse Practitioner Student Learning Outcomes in Telehealth and Face-to-Face Standardized Patient Encounters

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Background

- Achieving competence in diagnostic reasoning is essential for NP students to practice effectively and safely.

- Developing diagnostic reasoning competency requires practice and clinical experience.

- Securing adequate clinical placements is challenging, and there is a need to explore alternative ways to prepare learners for the complexities of independent practice.

Background

- Standardized Patient (SP) encounters can support development of Nurse Practitioner (NP) students' diagnostic reasoning ability in a uniquely authentic way.

- Access to face-to-face SP simulation experiences is limited, especially for online students.

- Telehealth-enabled SP encounters may be a feasible and effective means of offering simulated clinical experiences at a distance to increase experiential learning and assessment opportunities for NP students.

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Study Objectives

- Compare diagnostic reasoning outcomes of telehealth-enabled standardized patient encounters (TSPE) with outcomes of face-to-face standardized patient encounters (FSPE)
- Evaluate if TSPE is a viable method to teach and assess diagnostic reasoning competency in an online graduate nursing program.

Research Questions:

- What are the differences in students' diagnostic reasoning scores in TSPE and FSPE settings?
- What are student perceptions of the TSPE and FSPE experiences?

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Methods

Mixed-Methods, Sequential Design

Quan → Randomized, Crossover Experiment → Qual → Interviews

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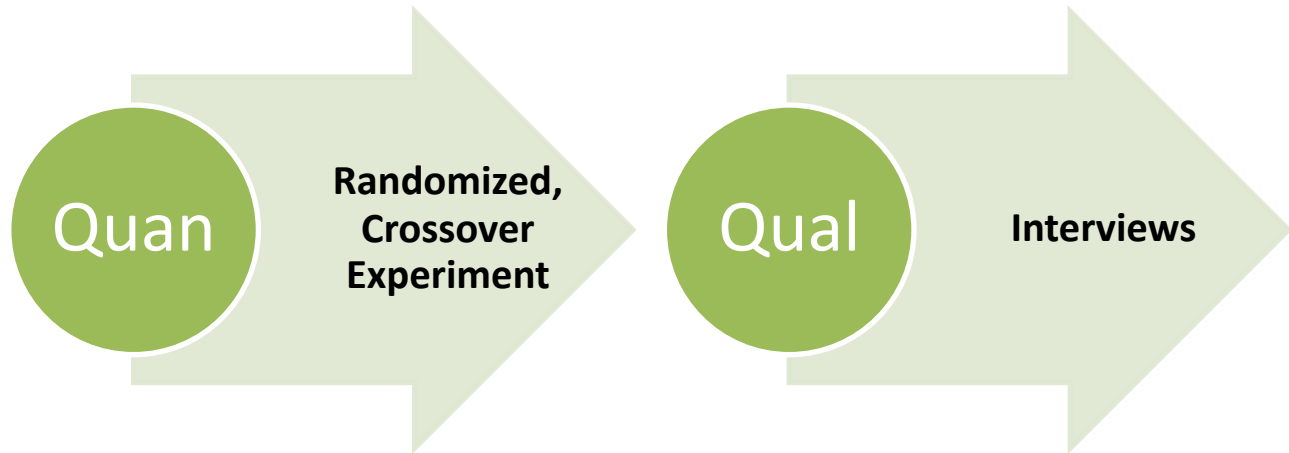
Methods: Characteristics of the Sample

Family Nurse Practitioner and Adult Geriatric Primary Care Nurse Practitioner Students (N = 41)

Variable	Frequency (%)
Years of Nursing Experience	
1-2 years	8 (19.5%)
2.01-5 years	13 (31.7%)
5-10 years	12 (29.3%)
>10 years	8 (19.5%)
Previous Telehealth Experience	
Yes	4 (9.8%)
No	38 (90.5%)
Highest Previous Degree	
Bachelors	21 (51.2%)
Masters	20 (48.8%)

Methods: Quantitative Phase

- **Independent variable:** Type of encounter (TSPE or FSPE)
- **Dependent variable:** Diagnostic reasoning (DR)
- **Cases:** Asthma or pneumonia

Randomized Groups

Group	N	First Encounter	Second Encounter
1	11	FSPE/pneumonia	TSPE/asthma
2	11	TSPE/pneumonia	FSPE/asthma
3	11	FSPE/asthma	TSPE/pneumonia
4	8	TSPE/asthma	FSPE/pneumonia

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Intervention

Face-to-Face SP Encounters

Telehealth SP Encounters

Measures

Diagnostic Reasoning Assessment (Pintz, 2006)

Items

1. History
2. Physical exam
3. Classification of findings
4. Analysis & interpretation of findings
5. Differential diagnosis
6. Final diagnosis

For each item, student performance is rated as:

1: Pre-novice

2: Novice

3: Advanced beginner

4: Competent

Psychometrics

- Initial testing:
  - Generalizability coefficient: 0.81; Convergent validity r=0.44
- Current study:
  - Intraclass correlation coefficient = 0.753

Pintz, C. (2006). *Assessment of diagnostic reasoning with standardized patients: Testing the reliability and validity of the diagnostic reasoning assessment.* Retrieved from https://archive.hshsl.umaryland.edu/handle/10713/1074

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Measures

- Two faculty evaluators per student

- Two DRA scores per participant:
  - Encounter
  - SOAP Note

- Third measure:
  - Did the student obtain the correct diagnosis? (Y/N)

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Results: Differences in DRA Scores

	Mean (SD)	t (p)
Is there a difference in DRA scores between TSPE & FSPE?		
TSPE	3.21 (0.48)	0.54 (p=0.588)
FSPE	3.17 (0.55)	
Is there a difference in DRA scores on encounters vs SOAP?		
Observed Encounters	3.18 (0.55)	0.22 (p=0.823)
SOAP Notes	3.20 (0.48)	
Is there a difference in DRA scores between cases?		
Asthma	3.19 (0.51)	0.5 (p=0.957)
Pneumonia	3.19 (0.53)	

Results: Effects of Sequence on Outcomes

	Mean (SD)	t (p)
Does sequence of cases relate to outcomes?		
Asthma first	3.26 (0.46)	1.51 (p=0.132)
Pneumonia first	3.14 (0.55)	
Does sequence of encounter type relate to outcomes?		
TSPE first	2.97 (0.51)	**5.54 (p<0.001)**
FSPE first	3.38 (0.44)	

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Results: Effects of Cases, Encounter Type and Evaluation Methods

Variables	Diagnosis		χ^2 (p value)	Effect size (phi)
	Incorrect	Correct		
Cases				
Asthma	21 (25.6%)	61 (74.4%)	0.55	φ =0.058
Pneumonia	17 (20.7%)	65 (79.3%)	(p=0.459)	
Sequence of cases				
Asthma first	11 (14.5%)	65 (85.5%)	6.02	**φ =0.192**
Pneumonia first	27 (30.7%)	61 (69.3%)	(p=0.014)	
Encounter type				
TSPE	16 (19.5%)	66 (80.5%)	1.23	φ=0.087
FSPE	22 (26.8%)	60 (73.2%)	(p=0.267)	
Sequence of encounter type				
FSPE first	12 (13.6%)	76 (86.4%)	9.70	**φ =0.243**
TSPE first	26 (34.2%)	50 (65.8%)	(p=0.002)	
Evaluation methods				
Observation	18 (22.0%)	64 (78.0%)	0.17	φ =0.032
SOAP notes	20 (24.7%)	61 (75.3%)	(p=0.679)	

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Qualitative Analysis: Methods

- Phone interviews with 20 of the study participants using a semi-structured interview guide and audio recorded.

- Interview recordings were transcribed verbatim for analysis.

- Transcripts were initially coded by 2 researchers. Codes were confirmed by a 3rd researcher.

- Themes were identified from the codes.

- Further validation with three other members of the team led to minor revisions.

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Qualitative Analysis: Themes

Theme 1: SP encounters are useful for student learning and preparation for advanced practice.

- Opportunity to practice clinical skills in a low-stakes setting:

    *I think it's helpful because it's more practice with a controlled setting where **it's not a real patient or it's not a test**...it's practice doing a focused exam and coming up with a plan and also having a dialogue with your patient and organizing yourself in a room. Because when you have a real person or in a scenario where you're being tested...you're under pressure – where **this is a situation where you weren't under any pressure really – like you just have to do your best.***

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Qualitative Analysis: Themes

Theme 1: SP encounters are useful for student learning and preparation for advanced practice.

- Value of individualized feedback*:*

  *I loved talking to the patients and then afterwards, **I really appreciated having the evaluation afterwards with the professor, who was able to really give me areas where I could do better**, where I did well. And we talked about each patient and how those chief complaints would present in a clinical setting. We talked about how we would treat the patient.*

Qualitative Analysis: Themes

Theme 1: SP encounters are useful for student learning and preparation for advanced practice.

- Opportunity to experience telehealth:

    *I think **telehealth is going to be implanted in a lot of practices that nurse practitioners will be a part of. And it's definitely something that I want to get more comfortable with**, now seeing that I wasn't as comfortable as I would have thought with it. So I think the more exposure to this the better…. Even in my clinical sites they're talking about trying to figure out how to implement telehealth, so I think more and more practices where we'll be working, it's going to be a reality.*

Qualitative Analysis: Themes

Theme 2: Telehealth SP encounters require orientation to technology-mediated interaction with patients.

- Lack of preparation for telehealth:

   *I found the telehealth was more difficult because **I just wasn't sure what was wanted from that and what is actually involved with a telehealth patient. I** just was unsure. I knew the nurse was supposed to do the assessment, but I was unsure if I'm supposed to tell her to get labs, get meds, or what.....I think it's just like outlining specifically what you were looking for with that telehealth interview. It wasn't the technology or anything. That was fine.*

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Qualitative Analysis: Themes

Theme 2: Telehealth SP encounters require orientation to technology-mediated interaction with patients.

- Sequence vs. modality:

  I found that I was more nervous during the first encounter in general. I don't think it had anything to do with telehealth versus face-to-face….so, I think my telehealth naturally went better, just because I was more comfortable and had my brain jumpstarted with the face-to-face.

  You have more practice if you have the face-to-face first. You've got your flow down of what you're going to ask and what you're going to – how you run your exam. And so, then you're less jilted by the telehealth because you already used that for the questions and you just have to adapt to the technology component.

Qualitative Analysis: Themes

Theme 3: Telehealth SP encounters require employing a new approach to the clinical encounter.

- Need to rely on nurse's assessment

  I didn't know how experienced the nurse was on the other end. If you're familiar with the nurse, like if it's a nurse that you work with all the time, like say I worked in home care and I knew that there was a specific nurse, and I knew how well she was at assessing patients, that would totally affect your comfort level with the information she was giving you.

Qualitative Analysis: Themes

Theme 3: Telehealth SP encounters require employing a new approach to the clinical encounter.

- Lack of physical presence in the room

  *There's always gonna be a part of me that definitely believes **that touch is important in a physical exam**, because someone may not necessarily have a fever, but some part of their body may be hot, which may lead me to a different diagnosis. Like for instance, gout versus osteoarthritis. Gout is going to be hot to touch and yet I can assess that.*

  *When you have a patient in front of you with equipment there and the room, and you're **getting the body language of the patient it helps trigger…things that you need to do**.*

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Qualitative Analysis: Themes

Theme 3: Telehealth SP encounters require employing a new approach to the clinical encounter.

- Lack of physical presence – building rapport

    It was easier to build a rapport with the person live *than with somebody through the media….I felt I just needed more connection with the patient.*

    I kind of lacked some of the personal interaction. I remember with the in-person patient, I asked him a little bit more about his family, and he mentioned daughters, and I asked him a little bit more about that…I did not even think in my mind to go there and try to make that more personal connection via the telehealth.

Qualitative Analysis: Themes

Theme 3: Telehealth SP encounters require employing a new approach to the clinical encounter.

- More time to think and process information

  While the nurse was performing some of the actions, I could think ahead to what my next action was going to be to tell her what to do. So, I felt like I could really process things better.

Conclusions/Discussion

- This study provides evidence to support the use of TSPE s as a feasible alternative to FSPE to develop and assess NP students' diagnostic reasoning ability.

- We found no difference in diagnostic reasoning scores between the telehealth and face-to-face SP encounters. Further research with different cases, settings and students is needed to determine whether these results are generalizable.

- If replicating this study, we would recommend:
  - Introducing students to the telehealth intervention prior to study event
  - Aligning cases with course content and clinical experiences

Implications for Practice & Regulation

- TSPE can aid NP programs in managing the costs and logistical challenges of on-campus SP events and provide students more practice in achieving program competencies.

- TSPE may be to help prepare students for future telehealth practice.

- Increasing access to SP simulations can improve clinical competence and increase the likelihood that students will successfully complete their academic programs, pass certification examinations and obtain licensure.

- Amidst clinical placements challenges, SP simulations may be a valid supplement to required clinical experience.

Questions?