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Pamela Pologruto

Physical Therapist Assistant Program, The Pennsylvania State University, United States, pjp17@psu.edu

Jennifer Jewell

Physical Therapist Assistant Program, The Pennsylvania State University, United States

Laura Cruz

Schreyer Institute for Teaching Excellence, The Pennsylvania State University, United States

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Dynamic Adaptations: Assessing the Integration of Standardized Patients in Physical Therapist Assistant Education

Pamela Pologruto ^{a,*}, Jennifer Jewell ^a, Laura Cruz ^b

^a Physical Therapist Assistant Program, The Pennsylvania State University, United States

^b Schreyer Institute for Teaching Excellence, The Pennsylvania State University, United States

Abstract

Purpose: The purpose of this study is to investigate the use of standardized patients in the physical therapist assistant (PTA) curriculum as compared to paper-based case studies with regard to reaching higher order thinking in preparation for the clinical environment.

Methods: Thirty-five participants were divided into 2 groups to participate in a discussion of a paper case scenario or engage with a standardized patient. Following the interaction, the students completed a survey related to their perceptions of the interventions along with open-ended questions intended to gain insight into application of clinical reasoning skills used during their respective intervention.

Results: The majority of the students reported they preferred hands on learning versus discussion/lecture. Prominent themes in the open-ended questions of the standardized patient group were reflection in action, adaptability, and navigation of ambiguity.

Discussion: Implementation of teaching/learning strategies, such as standardized patients, that require students to apply higher order thinking skills such as clinical reasoning and adaptability are critical in preparing students for entrance into healthcare.

Keywords: Physical therapist assistant, Standardized patients, Experiential learning, Clinical reasoning

1. Introduction

Clinical preparedness is the keystone of physical therapist assistant (PTA) educational programs. PTA programs are faced with the challenge of presenting content while also developing the student's ability to problem solve, apply, and adapt within the clinical setting. Programs must prepare students for an ever-changing fast-paced health care environment in which the unexpected patient response is in many cases expected. The clinical setting in which students will be entering is ever evolving and programs must adapt and prepare students adequately to ensure patient safety.

The expectations of the program's clinical partners have drastically changed as well. Clinicians are faced

with the challenge of treating more patients while also completing copious amounts of documentation to support their decisions and ensure reimbursement of services. Productivity standards for clinical staff need to be met to ensure employer satisfaction. This creates a challenging situation for both the student and the clinical instructor. The instructor is forced to squeeze in instructional time when a student is present in the clinical environment.

Theoretically, PTA programs can assist by improving student preparation prior to engagement in the clinical setting decreasing instructional burden once the student begins on site. This can allow for maximization of time spent learning in real time with real patients. The use of standardized patient experiences in the classroom has been

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* Corresponding author at:
E-mail address: pjp17@psu.edu (P. Pologruto).

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shown to an effective pedagogical strategy for allied health students to enhance learning and expose students to pre-clinical situations in a safe and controlled environment [1,2]. The use of this pedagogical strategy as a mechanism to enhance higher level learning is unknown with PTA students and the present study seeks to address that gap.

A common learning challenge across the health professions is the gap between theory and practice, or between the classroom and the clinic. In other words, the leap from learning about health care from a textbook to working with real patients is a large one. Experiential learning has emerged as a critical bridge in narrowing this gap and strengthening clinical readiness, especially in the implementation of increasingly complex simulated experiences. These learning activities occur both in the virtual world, such as computer simulations, and/or through classroom-based practices that mirror the real world of patient care, which allows students to practice hands-on skills in a safe and controlled environment. Because patient interactions are dynamic, educators have sought out experiential modalities that allow students to engage in dynamic scenarios that require skills in reflecting on action, creative adaptation, and complex problem solving.

To achieve these desired learning outcomes, pedagogical practices have shifted towards problem- and case-based learning in both classroom and clinical settings, including the use of simulated or standardized patients as dynamic case studies [3–5]. The use of simulated patients is intended to be a step beyond virtual or classroom (e.g., paper-based) simulations. The Human Simulation (HS) Continuum Model provides an overall framework of the different levels of human simulation applications and suggestions for the appropriate application within the classroom [6]. The continuum begins with student as role player, followed by structured role player, embedded participant, simulated patient and culminates with the use of standardized patients (SP) [6]. The levels of reproducibility and structure for the student experience increases along the continuum. A SP is defined as a person who repeatedly portrays his or her diagnosis or a set of symptoms, or a healthy individual who has been carefully coached to accurately portray a specific patient diagnosis or set of symptoms [7]. Benefits to the use of standardized patients in nursing, medicine and allied health are well documented [8], but less attention has been to the differences in learning outcomes between the levels of the HS continuum. This leaves the educator with a limited evidence base to determine which level of HS is most

appropriate for a given learning outcome and/or student population.

For the present study, we compared student learning outcomes between standardized patients and paper-based case studies as a means of reaching desired higher order thinking outcomes for PTA students. Because the benefits of SPs have been well-established for physical therapist students, it is often presumed that such clinical pedagogies would be equally valuable for PTAs, but that assumption has not been extensively studied with actual PTA students. There is a clear distinction between the degree preparation for the physical therapist assistant (2 year Associate degree) as compared to the physical therapist with a doctoral degree. Indeed, prior studies suggest that PTA students may exhibit learning characteristics that are distinct from physical therapist students; an insight which serves as the basis for an emerging research agenda focused specifically on the pedagogy of PTA programs [9–11]. The present study seeks to contribute to the latter by focusing on the use of standardized patients as a form of dynamic, experiential, problem-based learning intended to scaffold higher order clinical reasoning skills for pre-licensure physical therapist assistants.

2. Methods

2.1. Overview

The study took place at a large, public, geographically dispersed research-intensive university located in the mid-Atlantic region of the United States. Five campuses of The Pennsylvania State University offer two-year PTA degrees. Enrollments by campus are relatively small, with cohorts averaging approximately 10–15 students and aggregate graduate rates averaging approximately 55 students per year. Degree curriculum is standardized across the campus programs and faculty frequently collaborate on issues related to teaching and learning.

2.2. Participants

The study uses a quasi-experimental control group design with a convenience sample. All PTA students enrolled within the four course sections were selected to participate in either experimental or control pedagogical interventions in the classroom. Upon completion of the pedagogical intervention, students were recruited through a course management system. Twenty-two students engaged in a discussion of a printed case study and the remaining 13 students from the other two sections

completed the same case while interacting with a standardized patient. Students were divided based upon their section resulting in a sampling of convenience. The interventions were implemented contemporaneously based upon instructor scheduling, in weeks ten and eleven of a standard 15-week semester.

2.3. Materials

The survey, developed by the researchers, consisted of eighteen (18) questions, including five demographic questions, eight scaled items, and five open-ended responses. Survey questions were reviewed by an educational researcher and field tested with a small student focus group, then revised into their final form. Four items (using a five-point Likert scale) related to their perceptions of the intervention, four others (using five-point Likert scale) to their learning preferences. The open-ended questions were intended to gain insight into the clinical reasoning skills exercised by the students during their respective interventions (Table 1).

2.4. Procedure

In the classroom, all student groups were provided with a written case scenario of a complex patient named Pat Russel. For the case study group, a faculty member facilitated student group discussion of the appropriate interventions that would be performed during a physical therapy treatment. For the standardized patient group, students individually reviewed the same case scenario then performed the determined interventions on the standardized patient that was trained to react/ behave in a repeatable manner. Students had to perform the treatment interventions on the standardized patient and adapt to the patient's responses. Students were given 15 min to complete the interventions. Standardized patients were

recruited by the PTA faculty by asking for volunteers within their respected departments. The standardized patient was trained by the PTA faculty through online and in-person sessions. After completing either the written or the case study of standardized patient interaction, all students were asked to complete an electronic survey about their experience. After the survey, the standardized patient group then had a debriefing session with the PTA faculty that promoted reflection on action.

The ethics review board-approved survey was administered by a member of the research team who was not an instructor of one of the participating courses. A link to the survey was distributed via email and students indicated (implied) consent prior to completion. No identifying information was collected as part of the survey and results were not shared with instructors until after final grades had been submitted. Of the 38 students enrolled across all four courses, 35 of them completed the survey (22 in the control group, 13 in the experimental), for a response rate of 94.5%.

2.5. Analysis

In keeping with the demographic profile of the program, the majority of respondents were female (25 out of 35, 56%), and commuter (25 out of 35, 56%). Because of orientation towards career readiness, the PTA degree program typically attracts a relatively high percentage of first-generation and non-traditional students, the latter defined as either being 24 years of age or older, having served in the armed forces, or holding multiple adult roles (e.g., employee, head of household). In this sample, both attributes were present but not dominant, with 12 out of 35 (56%) identifying as first-generation and 12 out of 35 (56%) identifying as non-traditional. Four of the demographic characteristics (gender, non-traditional, first-generation, and honors student)

Table 1. Number of respondents for open-ended questions of the survey.

	Question Text	n (Control)	n (Experimental)
Q1	Please describe the barriers to completion of physical therapy interventions you identified for this patient.	22	10
Q2	Please describe how you would manage tubes and lines for this patient.	22	10
Q3	Please describe the specific instructions you would provide to this patient for deficit correction during gait training.	22	8
Q4	Please describe any and all adjustments you would make to your treatment if you had the chance to treat a similar patient in the future.	22	8
Q5	Please describe how the case study exercise contributed to your learning.	22	8

were statistically tested producing no significant differences between groups.

In addition to the demographic analysis, the scaled items on the survey were analyzed using descriptive statistics (see Table 2), including tests of significant difference between the control and experimental groups (see Table 3). Because the scaled data is non-parametric, Wilcoxon tests were run on each of the scaled items. For the open-ended survey items, a three-person research team, consisting of two instructors and an external educational researcher, analyzed the responses in three stages, in accordance with best practices in qualitative educational research [12,13]. The first stage utilized emergent coding, in which each of the researchers independently read the responses and identified potential themes [14]. After discussing and merging the themes, the researchers engaged in

a second round of deductive coding, applying the provisional themes identified in the first round to the entire corpus of student responses. After a further round of peer discussions, a final reading was conducted to affirm the validity of three persistent themes: reflection in action, adaptability, and navigation of ambiguity, which had emerged as learning outcomes distinctive to students who engaged with standardized patients.

3. Results

In keeping with prior research on learning preferences in the health professions, the majority of the students (32/35) reported that they preferred hands-on learning versus a discussion of skills with a relatively equitable distribution when asked if they preferred learning individually versus a group

Table 2. Survey question responses.

		Strongly Agree	Somewhat Agree	Neither Agree or Disagree	Somewhat Disagree	Strongly Disagree
Question 8						
Please rate the extent to which you agree or disagree with the following statements regarding your experience with the Pat Russell case study						
This experience with the case study facilitated my learning.	CS	59%	36.3%	4.5%		
	SP	76.9%	7.6%	15.3%		
This experience with the case study was a valuable use of my time.	CS	63.6%	36.3%			
	SP	76.9%	23%			
This experience with the case study is highly relevant to my future career.	CS	81.8%	18.1%			
	SP	84.6%	7.6%	7.6%		
This experience with the case study is not applicable to real patient care.	CS			4.5%	22.7%	72.7%
	SP	23%			23%	53.8%
Question 9						
Please rate the extent to which you agree or disagree with the following statements regarding your learning preferences						
I prefer learning through lecture rather than case studies.	CS	18.1%	18.1%	40.9%	13.6%	9.0%
	SP	7.6%		15.3%	61.5%	15.3%
I prefer lab practical assessments over written exams.	CS	18.1%	18.1%	40.9%	13.6%	9.0%
	SP	15.3%	23.0%	15.3%	7.6%	15.3%
I prefer hands on practice versus discussion of skills	CS	63.6%	31.8%	4.5%		
	SP	61.5%	30.7%	7.6%		
I prefer learning as an individual versus learning in groups.	CS			22.7%	22.7%	9.0%
	SP	7.6%	30.7%	38.4%	23.0%	
CS = Case Study Group. SP = Standardized Patient Group.						

Table 3. Standardized patient versus case study perceived learning outcomes.

Question #	Question Topic	t-test p-value	t-statistic	df	Wilcoxon p-value	W
8	Learning	0.50	-0.68	24.16	0.37	120.5
8	Value	0.48	-0.71	32.60	0.70	133.0
8	Relevance	0.80	0.26	18.26	0.94	141.0
8	Application	0.22	-1.29	16.78	0.30	116.5
9	Lecture	0.34	0.97	30.03	0.37	168.0
9	Labs	0.05*	-2.05	28.96	0.06*	90.0
9	Hands on	0.74	0.34	20.40	0.92	146.0
9	Groups	0.37	-0.92	24.62	0.48	123.0

(*) Indicates if p-value is < 0.1.

setting. A majority of students (22/35) reported that they preferred case studies versus lecture as an instructional strategy. Statistical analysis demonstrated that the standardized patient group (68%) had significantly higher preference for lab practical assessments over written examinations compared to the case study group (36%). Both groups of students (written case study and standardized patient) reported that each activity was a valuable learning tool and relevant to their future careers.

Thematic analysis of open-ended questions revealed themes more prominent in the standardized patient group: reflection in action, adaptability, and navigation of ambiguity. Reflection in action was performed by students in the standardized patient group as these students were required to actively assess the patient situation while performing the treatment. These students needed to “act on their feet” and change the course of treatment based upon the patient's reactions. While the case study group commented on the information provided, e.g., “(the case study) allowed us to think of exercises and progression ideas in regards to his therapy goals and the deficits he presents with along with the different types of disease in his PMH (past medical history).”; the standardized patient group commented that the standardized patient experience prepared them to treat real patients, e.g., “this case study made me think on my feet and spark creative ideas when providing interventions for a patient.”

Development of adaptability is an important characteristic for students to provide treatment to patients that can be unpredictable as a patient interaction unfolds. Performance of skills on a standardized patient requires adaptability to respond to unexpected situations. For example, a participant in the standardized patient group commented, “It helps to really simulate a real scenario instead of just doing book work, during clinicals nothing was really like the textbook, everything was different based on the patient, and the clinicians had to adjust for each patient.” The case study group did not demonstrate this theme as they did not have the opportunity to adapt to patient changes. Instead, the case study students commented, “It helped brainstorm ideas for a patient that had this problem.”

Students in the standardized patient group were more challenged to navigate ambiguity as the students needed to remain focused in uncertain situations. All students were able to identify barriers to treatment, but responses from students in the standardized patient group indicated a wider range of adaptations that were tailored to the specific patient. For example, one student stated, “(It was) hard to give good cues for patient because he can only

follow 1 step commands. The gait was very staggered and hard to find ways to facilitate normal gait” versus the case study group that listed various precautions listed on the case study, “Parkinson's, DM, Neuropathy, hydrocodone, blood thinner, fall risk.” In another example, when asked what they would do differently if given the opportunity to repeat the patient's treatment, students in the standardized patient group commented, “(I would) wheel the patient out so I could stand by them better to assist in getting up. Use simpler commands so they can understand better” whereas a student in the case study group said simply, “Better communication, keeping in mind level of assistance.”

4. Discussion

This study demonstrated that both instructional strategies—case studies and standardized patients—had positive effects on perceptions of student learning, but in different ways. The case study group seemed to have better focus on the details of the case study, while the thematic analysis of the responses of the standardized patient group indicated the navigation of higher-order challenges such as adaptation and ambiguity. Because physical therapy practices require the integration of lower order (e.g., understanding and remembering) and higher order thinking (e.g., evaluating) skills, it seems that there may be a place for both instructional approaches across the PTA curriculum.

The use of these instructional strategies is further affirmed by the strong preference students expressed for hands on, experiential learning into curriculum. In other applied disciplines, such as business, direct experiential learning has eclipsed prior reliance on stylized case studies. Given this shift, it is perhaps not surprising that the students who worked with the standardized patient placed significantly higher value on lab-based learning, as they experienced first-hand the power of this modality. Participation in a simulated patient case study requires the student to participate in a constant response algorithm which is an ongoing evolving process of decision making that needs to occur during healthcare treatments. The results of the qualitative analysis suggest that the dynamic adaptability to patient response were less likely to be developed from a linear, pre-determined paper case study discussion. The challenge in implementing more authentic experiences into university courses, however, is often logistical. Implementing a standardized patient program requires resources, including extensive preparation time and patient training. If you have limited resources, standardized patients may not be the most effective

learning strategy to implement. Our findings suggest that there may be pedagogical value in implementing less-resource intensive modalities, across the HS continuum, not just the culminating SP [6]. While the latter can be most effective in the objective assessment of clinical skills, students may learn—and prefer to learn— from modalities at even the lowest run of the ladder.

This latter insight has important implications for equity and inclusion, as lower-resourced institutions may not be able to provide standardized patient programs, but students at these institutions may be able to reap the benefits of learning through other, less resource-intensive, forms of simulated patient care. In addition, studies in inclusive teaching methods emphasize the need to create space for students, coming from a variety of experiences and abilities, to navigate their own pathways through a given case or problem, such as was illustrated by the wide range of responses from students who worked directly with a patient-actor [15]. Another area of future study could be to measure the effects of such teaching methods on the success and retention of students from under-served populations across the degree program.

When considering which level of standardization may be appropriate for their programs, instructors may need to align their learning outcomes not only with the modality, but also the level of that modality. In other words, an instructor should keep in mind whether or not the same learning benefits could be obtained with experiential learning activities at the lower end of the scale. In a simulated patient scenario, for example, trained actors require less training to play the role of patients, while creating a similar experience for all students. This means patient responses may not be standardized/repeatable, making it less effective for assessment purposes, but it does provide the student with the opportunity to learn to reflect in action, be adaptable and navigate ambiguity. More research in this area is needed to determine the most effective implementation and what level of standardization is needed to have the maximal student learning outcomes.

This study focused on a single cohort of students across four campuses at a well-resourced, predominantly-white institution. Further research involving a larger cohort and greater diversity of both institutions and student populations would be needed to expand the generalizability of the results. Additionally, each intervention group had a different instructor, which adds an additional confounding variable to the analysis.

A number of health professions, including nursing and physical therapy, are in the process of moving

increasingly towards problem- and case-based assessment in their accreditation and licensure standards. This shift reflects a growing recognition of the close alignment between these pedagogical methods and the patient care that will be expected of students when they become professionals in the healthcare workplace. The closer we can get to bringing the complexity of real patients to the classroom, the better prepared our students will be to engage in critical skills not only in clinical reasoning, but also reflective and reflexive practice; dynamic micro-adaptability, and the professional humility to recognize that many health care situations do not afford single-minded solutions.

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Declaration of competing interest

IRB approval has been granted by The Pennsylvania State University Institutional Review Board.

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