Physical Therapy Faculty Perceptions of High Fidelity Simulation Manikins

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Physical Therapist Faculty Perceptions of High Fidelity Simulation Manikins

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Abstract

This study examined physical therapist faculty members' perceptions of the use of high fidelity simulation manikins in the doctor of physical therapy curriculum. A basic interpretative analysis was used to explore each individual faculty member's perceptions through one-on-one semi-structured interviews. This study answered the research question: How do physical therapy faculty members perceive high fidelity simulation as a teaching methodology within the physical therapy curriculum? The data obtained through qualitative analysis allowed the investigator to describe the perceptions of eight physical therapist faculty members who do not currently teach with high fidelity simulation mannikins. An examination of themes across participants identified three overarching themes. These themes included high fidelity simulation mannikins are unnecessary to achieve course objectives, high fidelity simulation manikins are not humans, and teaching with high fidelity simulation manikins may not be worth the effort. The findings of this study can assist DPT programs considering implementation of HFS manikins into the curriculum by increasing awareness of potential barriers and facilitators among PT faculty who have not taught with HFS manikins. Further research is warranted to continue to explore the evolving role this technology has in the DPT curriculum.

Keywords: high fidelity simulation manikins, high fidelity simulation, physical therapy curriculum, physical therapy faculty, perceptions

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Faculty Perceptions of High Fidelity Simulation Manikins

Simulation-based learning experiences (SBLE) provide focused, deliberate practice in a safe and controlled learning environment for physical therapist (PT) students (Bishop, Sharp, & Ohtake, 2017). These experiences allow students to practice skills critical for physical therapists, including those in the psychomotor, clinical reasoning, communication, safety, and patient management domains (Greenwood et al., 2015). High fidelity simulation (HFS) is a specific type of SBLE that has been incorporated into the education of health professions students. High fidelity simulation is the use of a technologically advanced computerized manikin that mimics realistic patient situations (Mori, Carnahan, & Harold, 2015). High fidelity simulation allows PT students to transition from academic to clinical learning by fostering self-efficacy for clinical practice and the clinical decision-making skills expected of a doctoral-level professional (Silberman, Litwin, Panzarella, & Fernandez-Fernandez, 2016; Parker & Myrick, 2010).

Although HFS has been documented as an effective teaching tool for medical, nursing and physical therapy students (Brenner, Aduddell, Bennet, & VanGeest, 2006; McGaghie, Issenberg, Petrusa, & Scales, 2010), only 40-50% of Commission on the Accreditation in Physical Therapy Education (CAPTE) accredited physical therapy programs incorporate immersive experiences such as SBLE into the curriculum (Stockert & Ohtake, 2017). Immersive experiences are not exclusively HFS activities, but can also include low fidelity, moderate fidelity experiences and teaching with standardized patients (SPs). Low fidelity simulation does not need to be controlled or programmed externally for learners to participate (Palaganas, Maxworthy, Epps, & Mancini, 2014). Low fidelity simulation lacks realism and has been considered more beneficial for novice learners (Munshi, Lababidi, & Alyousef, 2015). In physical therapy education, low fidelity simulation is commonly implemented and includes

activities such as role playing, and paper case studies (Roberts & Cooper, 2017). Moderate fidelity experiences include teaching with manikins or task trainers but also lack the authenticity of a realistic environment (Ntlokonkulu, Rala, & Goon, 2018). In physical therapy education, moderate fidelity simulation may include pulse palpation, blood pressure assessment, assessment of respiratory rate, auscultation of heart and breath sounds, ECG monitoring, and determining oxygen saturation levels (Sword, Thomas, Wise, & Brown, 2017). A standardized patient (SP) is a trained individual that portrays a real patient in order to simulate a set of symptoms or problems used for healthcare education, evaluation, and research (Lopreiato et al., 2016). In physical therapy education, SPs have been implemented for learning of professional behaviors in physical therapy, and basic interviewing skills (Blackstock et al., 2013; Murphy, Imam, & MacIntyre, 2015) that require faculty time to develop appropriate case scripts and adequately train SPs which can be costly (Aso, Inoue, Yoshimura, & Shimura, 2013; Bressmann & Eriks-Brophy, 2012). A recent systematic review indicated there is insufficient evidence to determine the overall effectiveness on learning outcomes of implementing a SP program into entry level physical therapy education (Pritchard, Blackstock, Nestel, & Keating, 2016).

While the various types of SBLEs provide experiential learning opportunities for PT students to apply cognitive knowledge, practice psychomotor skills, and other clinical decision-making skills, HFS provides a safe learning environment that is both realistic and authentic (Bland, Topping, & Tobbell, 2014; Gaba, 2007). Low and moderate fidelity simulation experiences lack authenticity and realism, which can influence students' ability to learn (Bland, Topping, & Tobbell, 2014; Ntlokonkulu, Rala, & Goon, 2018; Roberts & Cooper, 2017). A recent systematic review demonstrated that the impact of SPs in PT education is not clear due to several factors including SPs ability to realistically portray a given case, time required for

training, and other associated costs (Pritchard, Blackstock, Nestel, & Keating, 2016). Standardized patient interactions have not been as valuable when PT students are assessing specific cardiovascular skills whereas high fidelity manikins are able to demonstrate physiological changes that the use of SPs cannot replicate (Smith, Prybylo, & Conner-Kerr, 2012). SBLEs provide PT students practical learning experiences, but HFS allows for teaching of specific skills and competencies that low fidelity, moderate fidelity, and SPs cannot replicate, such as vital sign changes, ECG changes, and other physiological responses demonstrated through a high fidelity manikin in a safe, low-stakes learning environment (Mori, Carnahan, & Herold, 2015).

Problem Statement

Despite the positive findings in the literature surrounding SBLEs using high fidelity manikins (Stockert & Ohtake, 2017), very few PT programs have incorporated HFS into the PT curriculum, and there are no studies were identified specifically related to PT faculty perceptions about teaching with HFS manikins in the curriculum. Stockert & Ohtake further discovered that of the 114 CAPTE accredited respondent physical therapy programs, 39.5% reported using immersive simulation for uniprofessional (PT) and interprofessional simulation experiences, 30.7% reported only PT simulation experiences, and 29.8% reported no use of immersive simulation (2017).

This study sought to understand PT faculty members' perceptions of implementation of HFS manikins within the PT curriculum. Understanding faculty members' thoughts on potential barriers and facilitators related to teaching with HFS manikins could provide opportunities for faculty discussion and decision making about utilization of this technology within physical therapy education. Increased teaching with HFS manikins could provide students with enhanced

experiential learning opportunities and improved preparation for clinical education and entry-level practice.

Purpose Statement & Research Questions

The purpose of this basic interpretive qualitative study was to explore physical therapy faculty members' perceptions of teaching with HFS manikins within the Doctor of Physical Therapy curriculum. Specifically, this study sought to answer the following research questions:

- How do physical therapy faculty members perceive HFS as a teaching methodology within the Doctor of Physical Therapy (DPT) curriculum?
    a. What is the current role of HFS in the DPT curriculum?
    b. What is the impact of perceived barriers and facilitators on the implementation of HFS within the DPT curriculum?

Significance of the Study

Faculty perceptions about teaching with HFS manikins within the PT curriculum could impact future curricular decisions, clinical education hour requirements, and the development of a framework for the implementation of HFS manikins within the PT curriculum. This study was timely as SBLE, including HFS has been suggested as a potential replacement for up to 25% of traditional clinical education hours in PT curriculums as the number of acute care clinical education experiences are decreasing (Blackstock, 2013; Mairella & Boissonnault, 2017; Mori, Carnahan, & Herold, 2015; Ohtake, Lazarus, Schillo, & Rosen, 2013; Pritchard, Blackstock, Nestel, & Keating, 2016).

Literature Review

Simulation

Simulation has been defined as a "technique that creates a situation or environment to allow persons to experience a representation of a real event for the purpose of practice, learning, evaluation, testing, or to gain understanding of systems or human actions" (Lopreiato et al., 2016, p. 33). Related to healthcare education, simulation has been defined as a set of conditions designed to present a clinical problem authentically that provides an opportunity for students to engage in realistic and contextually relevant clinical experiences prior to entering the clinical environment (Scalese, Obeso, & Issenberg, 2008). There are different types of SBLE including role playing, task trainers, teaching with SPs, and HFS (Lopreiato et al., 2016). Of these different types, high fidelity simulation provides a high level of interactivity and realism for the learner in a safe environment (INACSL, 2016). High fidelity simulation involves the use of a high fidelity simulator or full-body manikin that can mimic, at a realistic level, human body functions (Lopreiato et al, 2016). These manikins produce physical and verbal responses that are controlled by the instructor and adjusted based on the actions of the learner and the learning objectives of the scenario (Singh et al., 2013; Ward et al., 2014).

High fidelity simulation has been widely used among health care professions to teach and simulate situations from basic vital sign pathologies to infrequent or complex medical scenarios (Bednarek, Downey, Williamson, & Ennulat, 2014; Cooper & Taqueti, 2004; Jones & Sheppard, 2011; Mori, Carnahan, & Herold, 2015; Murray, 2005; Shoemaker, Riemersma, & Perkins, 2011). High fidelity simulation in healthcare education also is growing in its use for development of complex clinical decision making and interprofessional collaboration, including using HFS in the health care providers' practice environment (Sabus & Macauley, 2016). Due to these factors, HFS is being considered as a replacement for clinical education hours in some health professions' including nursing and physical therapy pre-licensure curriculum (Hayden, Smiley,

Alexander, Kardong-Edgren, & Jeffries, 2014; Bennett, Rodger, Fitzgerald, & Gibson, 2017; Dudding & Nottingham, 2018; Blackstock et al., 2013; Watson et al., 2012). According to the National Simulation Study, up to 50% of traditional clinical practice can be substituted with HFS across the pre-licensure nursing curriculum (Hayden, Smiley, Alexander, Kardong-Edgren, & Jeffries, 2014). Research supports that HFS has a significant impact on nursing students' clinical performance and psychomotor skills demonstrating a carryover of learning from simulation to clinical practice (Shin, Park, & Kim, 2015). A recent study by Grillo & Thomas demonstrated that HFS is an effective clinical education tool to encourage application of knowledge, skills, and attitudes among speech-language pathology students (2016).

Existing literature surrounding the use of HFS and Occupational Therapy (OT) students has demonstrated students' interest and preference for HFS to develop clinical skills, and significant improvement in their knowledge, skills, and confidence in working with patients in an adult acute care setting (Shea, 2015). Physical therapy education has included SBLE including HFS , SPs, and role playing which facilitate deeper learning by presenting sequenced, realistic cases, which are contextualized to the level of the learner (Lopreiato et al., 2016; Mullen, Willis, & Prost, 2018; Riopel, Litwin, Silberman, & Fernandez-Fernandez, 2018; Smith, Prybylo, & Conner-Kerr, 2012). While teaching with SPs and role-playing have been beneficial in physical therapy education, HFS allows learners to practice various skills within a realistic and dynamic clinical environment and has been correlated with effective learning (Shoemaker, Riemersma, & Perkins, 2009). The body of literature is growing about the use HFS in PT education, and it has been identified that HFS positively influences self-efficacy in PT students, increases student confidence in acquired technical, behavioral, and cognitive skills, as well as increases high satisfaction with the learning experience, while potentially improving acute care clinical

performance (Ohtake, Lazarus, Schillo, & Rosen, 2013; Rosenthal et al., 2006; Silberman, Litwin, Panzarella, & Fernandez-Fernandez, 2016).

Benefits of HFS and PT students

High fidelity simulation provides a way to capture students' experiences that can be vague, ambiguous, or harder to measure than didactic coursework (Semler et al., 2015). A recent systematic review by Mori, Carnahan, & Herold (2015) found that among studies that used HFS, PT students preferred HFS to see changes in patient signs or responses while interpreting ECG strips, and reported improved confidence in technical and behavioral performance measures (Ohtake, Lazarus, Schillo, & Rosen, 2013). Additionally, HFS has resulted in gains in clinical experience and the ability to modify patient examinations and interventions (Bednarek, Downey, Williamson, & Ennulat, 2014). As a learning tool, HFS also gives PT students the opportunity to practice cognitive, psychomotor, and communication skills, while providing a transition from the academic setting to clinical learning (Issenberg, 2006; Silberman, Panzarella, & Melzer, 2013). In particular, the opportunity for additional learning experiences can help to augment student learning experiences. This is important in that the Commission on Accreditation in Physical Therapy Education (CAPTE) requires that the PT curriculum include content and learning experiences that prepare students to achieve outcomes required for initial practice in physical therapy (2018).

In addition, the *Core Competencies for Entry-Level Practice in Acute Care Physical Therapy* detail the required behaviors and knowledge for entry-level clinicians in acute care (Greenwood et al., 2015). As evidenced in the document, clinical decision making and communication are two priorities described (Greenwood et al., 2015). HFS scenarios allow students to practice clinical decision making and communication in a hands-on manner.

PT Student Perceptions of HFS

Studies investigating PT student perceptions about HFS further explain the potential benefit of implementing HFS manikins into the PT curriculum. It has been noted that there is a shortage of physical therapists willing to work in intensive care settings including critical care, and a limited number of clinical placement spots for students (Silberman, Panzarella, & Melzer, 2013). Therefore, PT students' perceptions of increased confidence, self-efficacy, and comfort while working in the critical care setting are valuable in the implementation of HFS in the PT curriculum (Silberman et al., 2016; Stockert et al, 2011). If PT students feel more comfortable and confident prior to an acute or critical care clinical experience, student performance on the Clinical Performance Instrument may be higher (PT CPI, 2018; Silberman, Litwin, Panzarella, & Fernandez-Fernandez, 2016). For example, a recent study by Nitham, Spiegel, & Lorello, found that PT students reported improvements in their perceived readiness for clinical education, as well as clinical decision-making skills contributing to positive patient and hospital outcomes (2016). A recent study expands upon PT student perceptions related to neurological patient simulation scenarios and describes how PT students perceive HFS to promote advanced clinical performance through reflection, promote authenticity without high risk, and highlights the value of teamwork when participating in neurological patient simulation scenarios (Donlan, Greenwood, & Kiami, 2020).

High fidelity simulation also provides students the opportunity to participate in active learning that can facilitate the integration and application of information through problem solving, reflection of information, and feedback (Armbruster, Patel, Johnson, & Weiss, 2009). This active learning has been shown to result in perceived gains in confidence, decrease in anxiety, high satisfaction with the learning experience, and the ability to modify patient

examinations and interventions among PT students (Bednarek, Downey, Williamson, & Ennulat, 2014; Smith, Prybylo, & Conner-Kerr, 2012; Sword, Thomas, Wise, & Brown, 2017).

Interprofessionalism and HFS

High fidelity simulation provides PT students the opportunity to practice interprofessional collaboration in a realistic environment. This leads to stronger, patient-centered care given the sharing of knowledge across disciplines that is a requirement of CAPTE (CAPTE, 2017; Mai, Pilcher, Frommelt-Kuhle, 2018). High fidelity simulation provides a realistic learning environment that can facilitate a higher-level competency that includes interprofessionalism (Sabus et al., 2016). Gibbs, Dietrich, & Dagnan (2017) and Thomas, Rybski, Apke, Kegelmeyer, & Kloos (2017) included occupational therapy (OT) and physical therapy students in HFS experiences to incorporate interprofessional coordination and communication. Physical therapy and OT students reported an increase in knowledge, comfort, and confidence in handling an acutely ill patient with an IV, urinary catheter, and heart monitor (Gibbs, Dietrich, & Dagnan, 2017). Thomas et al. (2017) reported a significant increase in ratings of how prepared OT and PT students felt for acute care practice in the intensive care setting, and clinical instructors reported students were prepared to very prepared for and moderately confident to very confident in the acute care setting. Beyond PT and OT students, nursing and PT students also demonstrated an improvement in attitudes toward teamwork in an emergency hand off situation after participating in an HFS scenario together (Ronnebaum & Carlson, 2015).

Faculty and HFS

Despite the benefits of adding HFS into the PT curriculum, there have been few studies to demonstrate faculty perceptions and guidelines for implementation into the curriculum. However, nursing has provided an example of how HFS can be incorporated into healthcare

education which further helps to explain the importance of PT faculty perceptions into curricular implementation. In 2015, the National Council of State Boards of Nursing (NCSBN) released simulation guidelines for pre-licensure nursing programs (Alexander et al., 2015). These extensive guidelines include the need for commitment on the part of schools for simulation programs, the appropriate facilities for conducting simulation, education and technological resources with equipment to meet required objectives, qualified lead faculty and simulation lab personnel, faculty prepared to lead simulations, and policies and processes outlined by the program as part of the simulation experience (Alexander et al., 2015). Within each of these guidelines there are specific requirements for faculty such as knowledge of INASCL Standards of Best Practice, the ability to create a learning environment that encourages active learning and reflection through debriefing, knowledge of facilitation methods that meet the intended simulation objectives and expected outcomes, and the need for simulation-related professional development (Alexander et al., 2015).

A recent study about nursing faculty perceptions of HFS found that nursing educators carry a heavy workload due to teaching more than one group of students at a time, and these educators had not explored the various ways in which SBLEs can be applied in the nursing curriculum (van Vurren, Seekoe, & Goon, 2018). While the majority of nursing faculty had no formal training or experience using HFS, they believed that HFS was an effective teaching strategy and reported positive intentions to use HFS, but had negative beliefs regarding the amount of time, preparation, and ease of using HFS (van Vurren, Seekoe, & Goon, 2018).

While the NCBSN has released guidelines for simulation among nursing programs, PT programs do not have specific guidelines for the use of HFS within the curriculum. While student perceptions of HFS are generally positive, there are few studies investigating faculty

perceptions of HFS. However, literature does discuss the learning needs of faculty participating in simulation. In order to implement HFS, faculty members must understand the principles of simulation, from basic terminology to scenario creation to facilitated debriefing (INACSL, 2016). Additionally, it is important to note the frequency of HFS use is directly related to the complexity and provision of resources, such as faculty training, fear of technology, simulation support staff, administrative support, time constraints, designated laboratory space and equipment, and scheduling issues (Ray, 2017). Research has found that PT faculty are required to expend significantly more time and effort in order to implement HFS by expanding their teaching practice and course development (Cheng, Grant, Dieckman, Arora, Robinson, & Eppich, 2015).

The expansion of faculty teaching practice and course development must include required competence in creating specific educational objectives related to the use of HFS and performing debriefing sessions for PT reflection and learning (INACSL, 2016; Thackray & Roberts, 2017). Despite the critical role of debriefing in experiential learning situations such as HFS (Dieckmann, 2009; Fanning & Gaba, 2007; Rudolph, Simon, Rivard, Dufresne, & Raemer, 2007), faculty may struggle to learn and master this essential skill (Eppich & Chang, 2015). Due to the high cost of simulation equipment, as well as faculty time and training, further studies need to be done to justify to PT programs when, how, and why to use HFS in the curriculum (Baptista et al., 2016; Kardong-Edgren, Anderson, & Michaels, 2007).

Overall perceptions of PT faculty of SBLE have been researched by Greenwood and Ewell, and found that SBLEs, including HFS, enhanced PT faculty members' professional identity (2018). Additionally, PT faculty members' professional identity was influenced by the introduction and training to HFS, was interconnected with interprofessional education, and led to

professional transformation among faculty members (Greenwood & Ewell, 2018). Given the results of this study, further exploration about PT faculty perceptions of the implementation of HFS in the curriculum is needed to augment the current literature.

Method

Study Design

A basic interpretative qualitative design was employed to explore how physical therapy (PT) faculty members perceived HFS as a teaching methodology within the Doctor of Physical Therapy (DPT) curriculum by performing semi-structured one on one interviews to understand participants' perceptions. This design was well suited as the investigator desired to understand how the participants made meaning of a situation, phenomenon, and/or process, allowing for a rich description of the findings (Merriam, 2002).

Participants

Eight physical therapy faculty members from CAPTE accredited physical therapy programs participated in the study.

Inclusion criteria were as follows:

- Full-time DPT faculty members teaching acute care and/or cardiopulmonary content at U.S. institutions of higher education in physical therapy programs accredited by the Commission on Accreditation in Physical Therapy Education (CAPTE)
- Full-time DPT faculty members as above who have not previously used HFS in their course work

Setting

Interviews were conducted at a mid-sized DPT program in an urban Midwest city. For DPT faculty members not local, the on-line meeting app Zoom was used for the interview process.

Procedures

Recruitment. The primary investigator initially recruited participants by emailing PT faculty members known personally to the investigator. After contacting known faculty members, additional participants were needed. Therefore, snowball sampling was used in which existing study subjects recruited additional subjects among their acquaintances (Naderifar, Goli, & Ghaljaie, 2017).

The primary investigator recruited eight participants via email. This email communication included a brief description of the study, inclusion criteria, estimated time commitment, a brief description of procedures, and information about the primary investigator and her contact information (see Appendix A).

Individuals interested in participating in the study contacted the primary investigator via email and/or phone based upon the instructions provided in the recruiting email. The primary investigator confirmed eligibility for the study and answered any questions. When the PT faculty member agreed to participate, a time was established for the interview.

Informed Consent. Institutional Review Board (IRB) approval was obtained prior to recruitment and data collection from the University of Indianapolis. Once a participant expressed interest in the study, the primary investigator emailed him or her an informed consent document. This document contained key information for potential research participants including the purpose of the study, procedures including the interview process, the use of audio recording including confidentiality of information, and any potential risks or benefits of participation. The

participant received the informed consent document at least one day prior to the scheduled interview allowing the participant to review the document prior to the interview. The informed consent document was reviewed verbally at the beginning of the appointed interview time by the primary investigator in which she read through the document with the participant and responded to any questions or concerns. The document was signed by the participant and emailed to the investigator prior to the start of the interview.

Data Collection Process. Data was collected via one-on-one semi-structured interviews using a video-conferencing software. Semi-structured interviews allow researchers to understand and gain in-depth knowledge about complex phenomena (Mitchell, 2011), and, thus, was a fitting method to explore the meaning of DPT faculty members' experiences with HFS. This aligned well with the inductive nature of basic interpretive research (Merriam, 2002), and the investigator's aim of describing the perceptions of participant's experiences. Interviews took place in the investigator's office using video-conferencing software.

The interviews were conducted using a semi-structured interview guide (see Appendix B) and began with a general, open-ended question with the purpose of establishing a comfortable interview rapport allowing for the participant to express his/her feelings, thoughts, and perceptions about the use of HFS within the DPT curriculum. Probing and follow-up questions were asked to further explore faculty perceptions, and potential facilitators and barriers surrounding the use of HFS in the DPT curriculum. The investigator utilized a reflexive journal after each interview to capture any initial bias that might have occurred secondary to her own investment of teaching with HFS manikins. This reflexive journal helped to ensure that any potential bias on the investigator's behalf would not interfere with interpretation and analysis of

the interviews. Duration of interviews ranged from 30-60 minutes, and participants were audio recorded for transcription and analysis purposes.

Data Management & Analysis

The interview recordings were transcribed verbatim by the primary investigator. The primary investigator utilized Dedoose Version 7.0.23 for secure data management, analysis, and storage. Dedoose is a web-based application that allows for the organization, analysis, and storage of research data. Audio recordings were stored electronically and will be erased within three years of the study's completion. To protect confidentiality, the transcripts were de-identified prior to storage and a numeric coding system was applied to identify participants.

In keeping with the tenets of a basic interpretive approach (Creswell & Poth, 2018), transcript data were analyzed using a systematic coding procedure that ultimately elucidated participants' experiences and perceptions via the development of overarching themes. First, individual interview transcripts were read multiple times by the primary investigator. The initial coding process utilized an open coding approach in which key terms or phrases pertinent to the research questions were identified by the primary investigator and coded after reading and reviewing the transcripts. Specifically, the transcripts were read and re-read multiple times while highlighting and making hand-written notes of codes. Open coding was repeated after review and consultation with doctoral project committee members. Then, a codebook consisting of all open codes derived from analysis of interview transcripts was developed to organize the codes into potential patterns, which allowed for a visual way to further establish categories and themes. Using the codebook, patterns were noted and sorted into categories via axial coding (Merriam, 2002), and then organized into overarching themes (St Pierre & Jackson, 2014).

A second coder, and doctoral project committee members, were utilized in order to increase trustworthiness of the results. The second coder was a Doctor of Health Science student who is a physical therapist familiar with qualitative data analysis and coding. The second coder did not have any HFS experience in an effort to limit bias. The second coder reviewed two interview transcripts, and each doctoral project committee member reviewed two different interview transcripts for further discussion of potential open codes. Before moving to the development and analysis of themes across cases, the primary investigator, second coder, and committee met via phone, Zoom app, and email for comparisons. The committee members also performed check-ins at regular intervals to provide feedback and answer any questions or concerns.

Member checking, a tool used to enhance trustworthiness of the results, took place next. In this process, the interview transcript or analyzed data are returned to the participants to ensure accuracy (Birt, Scott, Cavers, Campbell, & Walter, 2016). In this study, member checking took place after the initial data analysis via phone call and/or Zoom app during a time that was convenient for both the primary investigator and the participant. If the primary investigator and participants were unable to perform the member check via phone call or Zoom app, the themes identified were emailed to the participants. During the member check, the primary investigator described the themes identified for the individual participant, and how these themes were determined. None of the participants felt it was necessary to provide corrections or clarifications.

Rigor & Trustworthiness

Trustworthiness was enhanced via reflexivity, sampling strategies, member checking, and peer review. When practicing reflexivity, the primary investigator was transparent about her position and any potential bases and assumptions that may be present in judging the authenticity

of the findings (Reid, Brown, Smith, Cope, & Jamieson, 2018). According to Ary, Jacobs, and Sorensen (2006), reflexivity, demonstrated with a reflective journal, helped the researcher to recognize his or her biases. The purposive sampling strategy allowed for the identification and access to participants who can help to understand a specific experience (Daly, 2007). Member checking increased trustworthiness by validating, verifying, and assessing the results of qualitative research (Doyle, 2007). Utilizing a second coder as well as doctoral project committee members increased the credibility of the study because the data was analyzed by more than one researcher (Lincoln & Guba, 1985; Nowell, Norris, White, & Moules, 2017). Additionally, a committee of three educational scholars supervised the study from proposal to completion. Each of these strategies increased the trustworthiness and overall rigor of the results of this study (Henderson & Rheault, 2004).

Results

Eight physical therapist faculty members with 3 to 12 years of teaching experience participated in this study. None of the participants had experience using HFS manikins in his or her teaching responsibilities at the time of data collection. Table 1 provides an overall description of the individual participants and demographic information about the participants.

Two of the eight faculty members were responsible for teaching acute care content only, three of the eight were responsible for teaching cardiopulmonary content only, and the remaining three were responsible for teaching both acute and cardiopulmonary content. All participants had varying-levels of experience with simulation-based education including low-fidelity, moderate-fidelity, and the use of standardized patients in their courses.

Overview of Findings

Three overarching themes arose through qualitative analysis of the transcripts which describe participants' perceptions of the use of HFS manikins in the DPT curriculum. Major themes were (1) HFS manikins are unnecessary to achieve course objectives; (2) HFS manikins are not human; and (3) Teaching with HFS manikins may not be worth the effort. The theme, "HFS manikins are unnecessary to achieve course objectives" describes the perception of how the use of other types of simulation, such as low fidelity, moderate fidelity, or standardized patients achieve desired course outcomes without implementation of HFS manikins. The theme, "HFS manikins are not human" describes how characteristics including lack of mobility, inability to communicate, and absence of feedback contribute to the perception that HFS manikins are not realistic enough to substitute for human interaction. The last theme, "Teaching with HFS manikins may not be worth the effort" describes how participants are less likely to implement this technology into the DPT curriculum due to the perceptions of access issues such as, cost, time restraints, and limited availability.

Theme 1: HFS manikins are unnecessary to achieve course objectives. Participants described how the use of other types of simulation, such as low fidelity, moderate fidelity, or standardized patients achieved desired course outcomes and provided "real life" clinically relevant scenarios without the need for implementation of HFS manikins. One participant who primarily used low fidelity, role play simulation explained the following as it related to achieving his course goals while providing "real life" clinical practice scenarios:

> It's a way for them to practice in not real-life situations but in safe situations that mimic real life. And so, there's a high level of stress, but low consequences and you know, that's kind of the way that they feel (Subject 107).

Another participant related to the importance of providing "real life" clinically based experiential learning opportunities using low fidelity simulation. "Using the manikin couldn't, like I couldn't get it if it functioned the way I wanted to, you wouldn't meet my educational goals philosophically" (Subject 121).

Other participants used standardized patients as their primary type of SBLE in their courses. These faculty members reflected upon the ability of students to interact with "real" patients, and the ease of logistics allowing a greater number of students to have more purposeful interactions by using this type of HFS in their courses. Participants perceived the fidelity or realism of the scenario to be of great importance. One participant stated, "I feel like if you did high fidelity simulation with standardized patients [versus HFS manikins], then that would be more realistic in my mind" (Subject 102). To further support the idea of increased value and efficiency in using standardized patients to achieve course objectives, another participant reported:

> When we do the actor portrayal simulation, we usually have 10 actors that come in for a four to six hour block so that we can have the students each work with the actor for 30 minutes…working through the manikin would be a challenge (Subject 104).

Participants valued the opportunity for students to have as realistic an experience as possible. By utilizing SPs there was a perception of ease of moving a large cohort of students through these experiences without having to put in additional valuable faculty and student efforts.

One distinctive perspective among this group of participants was that they were able to reflect and verbalize potential uses of HFS manikins outside of their specific course objectives. Typical course objectives for acute and cardiopulmonary content focused on clinical decision-making, patient management, and discharge planning "I think they have their place,

unfortunately, you know, I think they have their place for maybe examination and responding to emergency situations potentially" (Subject 109). Another participant voiced a similar thought:

> I think they can be very helpful, in working through medical interventions, right…My concern would be outside of managing of medical situations, I have trouble imagining how the clinic, like a high fidelity simulator is going to be an effective tool for therapists, for physical therapists because our primary goal is mobility (Subject 104).

There seemed to be an unwillingness to use HFS manikins in their courses even if there were potential to meet specific course objectives. This could be due to reported unfamiliarity and lack of experience with the manikins. As one participant stated,

> But the, the biggest barrier is, and this could be a lack of experience with using the manikin to simulate what I see in the clinic is hard for me to do. So that is one barrier that I haven't gotten over (Subject 121).

This is distinctive in that all participants reported experiential and active learning was at the core of their teaching philosophies. Participants also acknowledged that SBLE was an important part of their pedagogies. However, for this group of participants, other types of experiential learning such as low fidelity simulation and the use of SPs met their teaching philosophy and course objectives. Participants wanted to provide students with as many "real life" clinically relevant learning scenarios as possible, and HFS manikins were not perceived to be useful or necessary over other types of SBLE already in place.

Theme 2: HFS manikins are not humans. Participants described how characteristics including lack of mobility, inability to communicate, and absence of feedback contribute to the perception that HFS manikins are not realistic enough to substitute for human interaction. As physical therapists are considered movement experts, several participants felt HFS manikins were not

useful due to their lack of mobility. Lack of mobility specifically included the inability to transfer the manikin as well as the limited joint range of motion. One participant expressed, “The biggest problem that I have, or the biggest challenge that I see is that the manikin, it doesn’t, it doesn’t move on its own” (Subject 121).

Other participants noted the desire for students to practice communication and relational skills with patients. HFS manikins were perceived to lack the ability for students to practice “soft skills” vital for the physical therapy profession. One participant commented, “I think students, because we’re in a field where it’s such a hands-on profession, we are communicators, we’re hands on. We really need to have this relational experience with our patients” (Subject 105). Another participant identified the additional barrier of lack of feedback related to limited communication and physical limitations of the manikin, “They need hands on feedback. They need to hear it from a patient's perspective, and they will never get that with high fidelity [manikins]” (Subject 106).

An interesting point of discussion was provided when one participant noted the audio capabilities of HFS manikins. Students often practice auscultation with peers, and most peers would likely demonstrate normal heart and lung sounds. This participant noted the following during a lab session in which students were performing auscultation of both normal and abnormal heart and lung sounds.

> I guess they had a hard time differentiating what the sounds were supposed to simulate in all. Honestly, it’s a fake sound, so it’s not to them. They could definitely hear a stridor in the lungs or rhonchi…but I think the heart sounds were more difficult” (Subject 106).

This participant perceived the heart and lung sounds to be "fake" when students performed auscultation. This could be because students lack experience hearing abnormal sounds or could be due to the audio capabilities of the HFS manikin.

This group of participants felt strongly that HFS manikins lacked the realism they desired for implementation in the DPT curriculum. Participants wanted students to be able to mobilize the manikin, communicate and interact with the manikin, and have as clinically realistic patient scenario as possible. One participant noted her "ideal" HFS manikin,

> What I think about is having a blend between a human body and a high fidelity manikin. And then we have the changes in the vital signs and whatever else you wanted, but have it on a, a human that can move like a human (Subject 107).

Participants desired optimum experiential learning opportunities for their students. Having "real" human interaction and clinically relevant experiences were essential to this group of self-proclaimed experiential faculty. In addition to the perception that HFS manikins are not "real" enough to use in their courses, participants felt that other types of SBLE already in place were able to meet their course objectives. Besides these barriers, participants noted other barriers related to the current role of HFS manikins in the DPT curriculum.

Theme 3: Teaching with HFS manikins may not be worth the effort. The last major theme identified described the perceived value of implementing HFS manikins into the DPT curriculum. Participants specifically discussed access issues including cost of the manikins, time restraints for both faculty and students, and the availability to use the manikins on site. The participants perceived that even if barriers such as the ability to meet course objectives, a more life-like manikin was available, and access issues were resolved, they would not be likely to implement HFS manikins in the DPT curriculum. One participant said:

> Cost is the biggest barrier. I think sim labs are really expensive. I mean, we have a medical school on campus, but we can't use their sim lab for free and it's way too expensive for my university to afford (Subject 102).

Another participant added, "I don't find them useful and they're super expensive and I just don't think we get our money's worth out of them" (Subject 109). Another participant stated, "I mean, we can have the students have a full day of actual [clinical] experiences for a far less cost" (Subject 104)

Concerns related to time were described by one participant, "The simulation lab is 40-45 minutes away. You know, it's just, even though it's really not that far, it's kind of hard to coordinate all the students to go there at one time" (Subject 107). Another participant explained, "I also think it is incredibly time intensive, high fidelity sim and faculty intensive. So you need a lot more people to run a high fidelity sim" (Subject 102).

Lastly, faculty members described their perceptions about the limited application of HFS manikins in the DPT curriculum. One faculty member stated, "I think they have their place, unfortunately, you know, I think they have their place for maybe examination and uh, responding to emergency situations potentially" (Subject 109). Another participant shared similar concerns:

> I think they can be very helpful, in working through medical interventions, right…My concern would be outside of managing of medical situations, I have trouble imagining how the clinic, like a high fidelity simulator is going to be an effective tool for therapists, for physical therapists because our primary goal is mobility (Subject 104).

One participant summarized her perception of the value of HFS manikins, "To me, the, you know, the juice isn't worth the squeeze so to speak" (Subject 102).

Other types of SBLE provided the participants' desired course objectives and met their teaching philosophies. HFS manikins were also perceived to lack the "real life" clinical experiences these participants were seeking when performing SBLE. Simulation-based education was valuable to participants and perceived as essential in the curriculum. However, HFS manikins were not perceived as worth the trouble to implement. Participants were not interested in taking additional time out of already busy schedules to pursue a type of SBLE that they did not believe would add value to their courses. Participants felt confident and comfortable with using other types of SBLEs that fulfilled their course objectives, teaching philosophies, and desire for "real life" clinical experiences. Participants perceived that even if HFS manikins were available to them, the majority would not find them useful or valuable. The cost in money, faculty and student time, and access to manikins made it prohibitive for these participants to consider implementation of HFS manikins into the curriculum even if the technology was available on site.

Discussion

The findings of this study begin to explain physical therapy faculty members' perceptions about the current role of HFS manikins in the DPT curriculum. While each participant brought a unique perspective to the discussion, three overarching themes arose describing the perceptions surrounding the use of HFS manikins.

Participants in this study described the perception of how HFS manikins were unnecessary to achieve course objectives and preferred to teach with other forms of SBLE already in place such as low fidelity simulation and standardized patients. Some participants preferred to teach with low fidelity simulation rather than HFS manikins as it was perceived as a more valuable learning tool in their courses. Teaching with low fidelity simulation has been

shown to be effective as a learning tool in PT education. Evidence indicates that students reportedly have been overwhelmingly positive in their assessment of peer simulation (low fidelity simulation) as a learning tool. There were no negative comments about the use of low fidelity simulation as an educational method, and students reported that peer simulation enhanced their communication and clinical reasoning skills (Dalwood, Maloney, Cox & Morgan, 2018). In addition to low fidelity simulation, the participants in this study were more likely to teach with SPs than HFS manikins. Simulated patients are trained to depict a real patient, including both physical and emotional characteristics, and can be valuable in PT training, as they can portray active movements and functional mobility skills critical to physical therapy examination and interventions (Silberman et al., 2018). A recent study noted that PT students found a SBLE using SPs to be engaging, satisfying, and built confidence (Dennis, Parry, Miolin, Mercer, & Furness, 2019). A recent meta-analysis demonstrated that simulated patients appear to have an effect comparable to alternative educational strategies on development of PT clinical practice competencies and serve a valuable role in entry-level physical therapy education (Pritchard, Blackstock, Nestel, & Keating, 2016).

Participants in this study also described the perception that HFS manikins were too costly, time intensive, and often have limited accessibility on site. Simulation can be a time-consuming learning method as high fidelity simulation requires high staff-to-student ratios and well equipped simulated learning environments (Roberts & Cooper, 2017). Similar barriers have been reported in the literature that included time, resources, access to the lab (it is used by multiple departments), and the limited number of faculty who have been trained in running simulations and effectively guiding debriefing (Mai, Pilcher, & Frommlet-Kuhle, 2018). While PT literature has indicated there is insufficient evidence available at this time to unequivocally

determine the effect of SP interactions compared with no SP interaction or an alternative form of SBLE (Pritchard, Blackstock, Nestel, & Keating, 2016), participants in this study felt that the barriers related to implementation of HFS manikins was too great to add or replace current practices in place. An intriguing finding in this study was an apparent unwillingness of participants to teach with HFS manikins even if the technology was available on site. In part, this is due to reported implementation of other types of SBLE to achieve course objectives, such as low fidelity and standardized patients. This finding was unexpected as literature has demonstrated the value of HFS in PT education. High fidelity simulation has been implemented among health care professions to teach and simulate situations from basic vital sign pathologies to infrequent or complex medical scenarios (Bednarek, Downey, Williamson, & Ennulat, 2014; Cooper & Taqueti, 2004; Jones & Sheppard, 2011; Mori, Carnahan, & Herold, 2015; Murray, 2005; Shoemaker, Riemersma, & Perkins, 2011). Additionally, HFS provides a way to capture students' experiences that can be vague, ambiguous, or harder to measure than didactic coursework (Semler et al., 2015). As a learning tool, HFS also gives PT students the opportunity to practice cognitive, psychomotor, and communication skills, while providing a transition from the academic setting to clinical learning (Issenberg, 2006; Silberman, Panzarella, & Melzer, 2013). Despite the findings in the literature in support of teaching with HFS manikins, this group of participants have established other types of SBLE to fulfill experiential learning activities.

Participants also believed there was a lack of realism associated with HFS manikins. Specifically, they perceived that HFS manikins lacked mobility, produced fake sounds, and that students have limited ability to communicate and receive feedback from manikins. Therefore, HFS manikins were perceived as not realistic enough as compared to human interaction, and not suitable for implementation in their courses. This group of participants desired for students to

experience “real life,” clinically relevant learning scenarios. While participants perceived HFS manikins to be unrealistic as compared to humans, current literature supports that HFS manikins mimic, at a remarkably high level, human body functions (Lopreiato et al, 2016). High fidelity simulation provides a high level of interactivity and realism for the learner in a safe environment (INACSL, 2016). Additionally, HFS manikins produce physical and verbal responses that are controlled by the instructor and adjusted based on the actions of the learner and the learning objectives of the scenario (Singh et al., 2013; Ward et al., 2014). Evidence also demonstrates that PT students preferred HFS to see changes in patient signs or responses while interpreting ECG strips, reported improved confidence in technical and behavioral performance measures, reported a decrease in anxiety as well as high satisfaction with the learning experience while using HFS manikins (Ohtake, Lazarus, Schillo, & Rosen, 2013; Smith, Prybylo, & Conner-Kerr, 2012). Participants in this study did not have experience teaching with HFS manikins, which is likely why the manikins were perceived to be unrealistic, not “human” enough, and at odds with PT student perceptions about the value of learning with HFS manikins.

Another surprising finding in this study was that all faculty members unanimously described experiential learning was their preferred teaching philosophy but were not willing to teach with HFS manikins. Experiential learning requires that students apply knowledge to new and different experiences. Students must engage in critical thinking and be active participants in their learning process (Smith & Crocker, 2017). Various types of SBLEs provide experiential learning opportunities for PT students to apply cognitive knowledge, practice psychomotor skills, and other clinical decision-making skills. HFS provides a safe learning environment that is both realistic and authentic (Bland, Topping, & Tobbell, 2014; Gaba, 2007). HFS also allows learners to practice various skills within a realistic and dynamic clinical environment and has

demonstrated correlation with effective learning (Issenberg et al., 2005; Shoemaker, Riemersma, & Perkins, 2009). Despite the support from literature that HFS is an effective experiential teaching tool, the faculty in this study did not identify the use of HFS manikins as valuable to incorporate in their courses as an experiential learning tool.

Similarly, PT faculty members in this study did not perceive HFS manikins to be an asset in the PT curriculum. This finding was unanticipated as literature has demonstrated the value of HFS manikins in PT education. HFS has been found to increase PT student's perceived confidence and competence in the clinical setting (Mori, Carnahan, & Herold, 2015; Silberman, Litwin, & Panzarella, 2016). Evidence has also described student perceptions of the value of HFS by endorsing the experience as it reinforced course content, was a useful teaching method, and should be added to additional courses in the PT curriculum (Ohtake, Lazarus, Schillo, & Rosen, 2013). The implementation of HFS manikins have recently been studied beyond use in acute and cardiopulmonary scenarios to include neurologic and pediatric populations demonstrating the value of HFS in PT curriculum (Donlan, Greenwood, & Kiami, 2020; Hough, Levan, Steele, Kelly, & Dalton, 2019).

In this study, participants did not have experience teaching with HFS manikins, which might help to explain why there is an apparent disconnect between the well-established value of HFS and what the participants perceive. Participants described a greater number of barriers than facilitators for implementation of this technology into their courses, indicating a decreased likelihood for implementation of HFS manikins in their courses. This group of participants applied their experiential learning philosophy by teaching with other types of SBLE that provided the real-life, clinically relevant scenarios they were seeking. Fidelity seemed to be the deciding factor in what type of SBLE to implement. Specifically, participants in this study were

concerned with physical, functional, and psychological fidelity. Physical fidelity refers to the appearance of a manikin whereas functional fidelity would reflect physiological changes. Both pertain to the psychology of learning (Schoenherr & Hamstron, 2017). The participants in this study perceived they were able to achieve physical, functional, and psychological fidelity by teaching with other types of SBLE. Teaching with HFS manikins was not a consideration among this group of participants as they were satisfied with their students' outcomes in their courses and received positive feedback from students about other SBLEs such as low fidelity simulation and SPs.

Limitations

There were several limitations in this study. Participants were interviewed only once, and as a novice qualitative investigator, there is potential that more follow up questions could have added increased depth to the perceptions and results. A second interview could have gleaned additional reasons why participants perceived HFS the way it was described.

Participants were limited to a small number of accredited physical therapy programs within the United States. However, there are other physical therapy programs outside of the United States utilizing simulation that have been referenced within this study. Therefore, the results of this study may not be generalizable to all PT faculty members, however this is not the primary goal of qualitative research.

The investigator has also taught with HFS manikins in her own courses and is supportive of the use of HFS manikins in the DPT curriculum. While this bias was known prior to the investigation and every effort was made to increase rigor and trustworthiness, her own experiences could have impacted the results. Specifically, this bias may have led the investigator

not to ask as many follow up questions due to her own assumptions of how the participants responded to interview questions.

Implications for PT educators

This study adds to the of literature surrounding PT faculty perceptions of teaching with HFS manikins in the DPT curriculum. This study was completed prior to the COVID-19 pandemic, however, due to changes in DPT curriculum requiring increased remote learning opportunities and limited in person clinical education experiences, these findings need to be further defined. According to CAPTE, during the COVID-19 pandemic, PT students may demonstrate competence by the "implementation of telehealth, pro bono clinical experiences, simulation experiences, part-time clinical education, and in-class patient care, including paper or video case studies" (2020). The results of this study are timely as teaching with HFS manikins may need to be incorporated more readily into the DPT curriculum to replace the face-to-face interactions on hold secondary to COVID-19.

Openness to explore other types of simulation. Participants in this study were able to meet desired goals for their courses without implementation of HFS manikins. While teaching with low fidelity and standardized patients have benefits as reported in PT literature, HFS manikins can also provide benefits to PT students (Dalwood, Maloney, Cox & Morgan, 2018; Dennis, Parry, Miolin, Mercer, & Furness, 2019). This study has identified a potential dilemma that warrants further exploration. While this group of participants was able to achieve course objectives with other types of SBLEs, teaching with HFS manikins could become necessary due to the COVID-19 pandemic. PT educators in acute and cardiopulmonary content may be compelled to explore other types SBLEs to enhance clinical education hours and preparation for entry level practice given the significant challenge of finding acute care placements for students.

HFS manikins can be realistic. PT educators in this study were focused on the lack of realism associated with HFS manikins. Lack of mobility was perceived to be a major barrier for implementation in participants' courses as well as lack of communication and feedback. Current literature supports that HFS manikins mimic, at a very high level, human body functions (Lopreiato et al, 2016). High fidelity simulation provides a high level of interactivity and realism for the learner in a safe environment (INACSL, 2016).

PT educators should consider the importance of fidelity in their selected method of SBLE. Each educator should identify what features of SBLE are critical to their learning objectives (Schoenherr & Hamstra, 2017). With experience, PT educators can discover the technology that best fits the fidelity they are seeking for their students from low fidelity simulation to the implementation of HFS manikins.

Accessibility to HFS manikins. The findings of this study indicate that participants could see potential value in the use of HFS manikins, but it was perceived as not worth their time or efforts to implement as other types of simulation reaped the results they were seeking for their courses. Participants in this study may have been willing to use HFS manikins in their courses if access was more feasible. The cost and accessibility barriers to HFS prompt the need to explore the educational benefits of more basic, accessible, and functionally realistic SBLEs (Issenberg & Scalese, 2008; Dalwood, Maloney, Cox & Morgan, 2018). Having a HFS manikin available for use on site was perceived as a facilitator in this study. Participants described how a sharing program or trade-off would promote interprofessionalism among departments at their universities.

Time was also perceived to be a barrier to implementing HFS manikins. This included faculty training time, travel time for both faculty and students if no manikin was available on

site, and time to run a complete scenario. PT educators may choose to receive formal simulation training, or train by self-study or shadowing.

Implications for Future Research

Most of the research surrounding HFS and physical therapy is quantitative in nature. This study and few others have been qualitative in nature. Qualitative research allows for deeper meanings and increased depth of understanding participants' feelings and perceptions about simulation. This study has the potential to be expanded to additional interviews to understand further the "why" participants perceive HFS simulation manikins in the way described. With the onset of the COVID-19 pandemic, there could be further need for implementation of more SBLEs in the DPT curriculum. Further qualitative studies from viewpoints of both physical therapy faculty and students will allow for a deeper understanding of potential barriers and facilitators. Quantitative research is also important to add to the body of growing literature in this area, specifically outcomes of HFS manikin experiences as it translates to clinical performance among physical therapy students.

Conclusion

This study sought to explore physical therapist faculty member's perceptions of the implementation of HFS manikins in the DPT curriculum among eight participants. Three themes were identified that represented participants' perceptions: HFS manikins are unnecessary to achieve course objectives, HFS manikins are not humans, and teaching with HFS manikins may not be worth the effort. The findings in this study provide insight to DPT programs and physical therapy faculty who are seeking to learn more about HFS manikins and how they may or may not be viewed as valuable within the DPT curriculum. DPT programs may also use these findings to help implement HFS manikins into the curriculum by awareness of potential barriers

and facilitators among those PT faculty who have not taught with HFS manikins. Ongoing research surrounding the implementation of HFS manikins in PT education should continue to explore the evolving role this technology has in the DPT curriculum.

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Table 1

Participant Characteristics

Subject Number

	103	104	105	106	107	108	109	121
Gender	F	F	F	F	F	M	F	M
# of years faculty	11	8	12	5	3	5	4	7
Course Instruction	A/CP	CP	A/CP	CP	A	CP	A	A/CP
Cohort Size	30	83	27	77	31	48	65	35
Institution	Pr	Pr	Pr	Pr	Pr	Pu	Pr	Pu
HFS manikin	No	No	Yes	Yes	Yes	No	No	Yes
Nursing program	Yes	Yes	No	Yes		Yes	No	Yes

A-acute, CP-cardiopulmonary, Pr-private, Pu-public

Appendix A

Dear Colleagues,

My name is René Thomas. I am a Doctor of Health Science student at the University of Indianapolis. I am inviting you to participate in a study that I am conducting as part of my Doctoral degree. The title of my study is Physical Therapist Faculty Perceptions of High Fidelity Simulation.

High fidelity simulation (HFS) and other simulation based learning experiences (SBLE) have been documented as an effective teaching tool for medical, nursing, and physical therapy students. Despite this, only 40-50% of Commission on the Accreditation in Physical Therapy Education (CAPTE) accredited physical therapy programs incorporate immersive experiences such as SBLE including HFS into the curriculum. Therefore, the purpose of this qualitative study is to explore physical therapy faculty members' perceptions of high fidelity simulation within the Doctor of Physical Therapy curriculum.

If you decide to participate, you will be asked to meet with me in person or virtually at a mutually agreed upon time and location for an interview lasting approximately 45-60 minutes. Participation is confidential and completely voluntary. Below are the inclusion criteria to participate in this study:

- Full-time DPT faculty members teaching acute care and/or cardiopulmonary content at U.S. institutions of higher education in physical therapy programs accredited by the Commission on Accreditation in Physical Therapy Education (CAPTE)
- Full-time DPT faculty members as above who have not previously used HFS in their course work

If you are interested in participating in this study, please contact me at 317-698-8733 or by email at rlthomas@uindy.edu. I look forward to speaking with you and thank you in advance for your assistance in this project.

Sincerely,

René Thomas, PT, DPT, CLT-LANA

Appendix B

My name is René Thomas. I am a student at University of Indianapolis. I will be conducting this interview for my Doctoral Project. The responses you provide for this interview will be used for the purposes of this doctoral project only; your responses are confidential. Your responses may be discussed with my Doctoral Project committee, but any identifying information will be removed.

The purpose of this interview is to explore physical therapy faculty perceptions of using high fidelity simulation in the Doctor of Physical Therapy curriculum. You will provide the perspective of a physical therapy faculty member.

The time frame for this interview will be 30 minutes to 45 minutes. Your participation is voluntary, and you may choose not to answer one or more questions. The interview can be terminated at any time upon your request. Do you have any questions about the interview or how the data will be used?

To ensure I have all of your responses correct, I would like to audio record the interview. The recording will be deleted once it has been utilized for doctoral project purposes. Is it ok if I record the interview?

RECORDING…I have started recording, is that ok?

Questions:

1. Please tell me a little about your background.
    a. How long have you been a physical therapy faculty member?
    b. What courses are you primarily responsible for teaching?

2. What experience(s) have you had with simulation as a student and/or faculty member?
    a. What type of simulation was used (high, moderate, low)?
    b. What was the purpose of the simulation?
    c. How did the simulation make you feel? How did it make the students feel?

3. What are your thoughts regarding the use of HFS in the PT curriculum?
    a. How do you think HFS impacts PT students' educational experience?
    b. How do you feel about HFS potentially being a replacement for clinical experience hours?

4. What are some barriers that would lead you not to use high fidelity simulation in one of your courses?
    a. Why do you consider this to be a barrier?
    b. What could be done about this barrier so that you would use high fidelity simulation in your course if you desired?

5. What are some facilitators that would lead you to use high fidelity simulation in your courses?
    a. Why do you consider this to be a facilitator?
    b. What else could be done to help you implement high fidelity simulation into your courses if you had the desire?

6. How would you describe your identity/philosophy as an instructor?

a. What role do you take in preparing students to be effective clinicians?

b. What are your thoughts on experiential learning?

7. To what extent has high fidelity simulation had an impact on you professionally as a faculty member?

a. What impact has high fidelity simulation had on physical therapy students?

6. Thank you for your time; do you have anything else to share about high fidelity simulation in the physical therapy curriculum?

This now concludes our interview. This interview will be downloaded and stored for further analysis. The data will be transcribed into Microsoft Word and stored on my personal computer with password-protection to determine possible themes and codes. The transcriptions will not contain any personal or confidential information. De-identified data including interview transcripts, spreadsheets, theme tables, and codebook will be stored on my computer password-protected for future research. Thanks again for your participation.