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Self-efficacy with Telehealth Examination: The Doctor of Physical Therapy Student Perspective

Derrick F. Campbell¹^{*}, Jean-Michel Brismee², Brad Allen², Troy Hooper², Manuel A. Domenech¹, Kathleen J. Manella³

¹ University of St. Augustine for Health Sciences, Austin, Texas, USA

² Texas Tech University Health Sciences Center, Lubbock, Texas, USA

³ Nova Southeastern University, Tampa, Florida, USA

*Address all correspondence to Derrick F. Campbell at dcampbell@usa.edu

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Abstract

Introduction. The shift to telehealth exposed gaps in our understanding of how physical therapy students perceive patient assessment in a remote situation using the examination component of the patient/client management (PCM) model. The purpose of the study was to compare Doctor of Physical Therapy (DPT) students' self-efficacy performing patient assessment using the examination component of the PCM model using telehealth compared with conventional examination. To achieve the purpose of this study, the Physical Therapist Self-Efficacy (PTSE) scale was used. More specifically, self-efficacy in clinical reasoning was measured using the following items: (1) PTSE total score (2) performance of tests and measures, (3) determining when to refer to another practitioner, and (4) screening for primary medical disease.

Methods. A survey-based descriptive and exploratory repeated measures design was used, with surveys distributed to entry-level DPT students during their clinical experiences in the United States during the Fall 2020 semester. A convenience sample of 35 second- and third-year entry-level DPT students who reported provided both telehealth and traditional examinations during clinical experiences was used. Descriptive and inferential statistics were used to evaluate within group differences comparing student self-efficacy using telehealth and conventional examination.

Results. Wilcoxon sign ranks revealed statistically significant differences in self-efficacy scores of students conducting patient assessment using telehealth compared to conventional examination. More specifically, scores for telehealth were lower ($P < 0.001$) compared to conventional examination in PTSE total score, performance of tests and measures, determining when to refer to another practitioner, and medical screening for primary disease.

Discussion. Doctor of Physical Therapy students' self-efficacy was lower when providing telehealth across all PTSE questions pertaining to the examination component of the PCM model. Exploring telehealth content and sequence in entry-level physical therapy curriculum may help students feel more prepared to perform telehealth examination.

Keywords: examination, physical therapy, self-efficacy, students, telehealth

Introduction

Shift to Telehealth in Physical Therapy Practice

Doctor of Physical Therapy (DPT) students' clinical experiences were changed by the COVID-19 pandemic from conventional face-to-face to telehealth examinations (APTA.org, 2020; Fisk et al., 2020). The transition to telehealth uncovered perceived knowledge gaps in how entry-level DPT students conducted patient assessment using the patient/client management (PCM) model (Postal, 2020; Guide, 2003). While telehealth examination will have an impact on the field in the future, there are still gaps in our knowledge of how DPT students perceive their own self-efficacy in relation to telehealth examination during clinical encounters (Jones & Sheppard, 2011; APTA.org, 2022).

Importance of Screening for Referral by Physical Therapists

The American Physical Therapy Association (APTA) advocacy for direct access has meant the partial elimination of the physician referral mandated by state law to access physical therapist services for examination, evaluation, and treatment (APTA.org, 2022; Hon et al., 2021). DPT students are expected to exhibit competency screening for referral both before and after clinical encounters, regardless of the practice location (Heick, J., & Lazaro, 2022). The goal of screening for referral is to determine whether a patient has a condition that can be treated by physical therapy intervention and, if not, whether that condition necessitates referral for evaluation by a physician or other healthcare provider (VanWye et al., 2016). The physical therapist will conduct the interview, the systems review, and administer specific tests and measures during the examination component of the PCM model, which is when screening will take place (Heick, J., & Lazaro, 2022).

Physical Therapy Students' Clinical Reasoning Self-Efficacy

The self-efficacy of DPT students, or their judgments of their ability to conduct the necessary courses of action to deal with potential situations, determines their capacity to generate and regulate a clinical choice (Bandura, 1982; Aper et al., 2012). Self-efficacy is crucial for students' thought processes, behavior, and attitude (Campbell et al., 2022; Bizama et al., 2022). For example, the lack of readily available instruments that monitor vital signs remotely may affect clinical reasoning self-efficacy of DPT students performing the patient assessment. Understanding DPT students' self-efficacy when performing telehealth examination may help entry-level physical therapist education programs establish best practice for teaching students.

Physical Therapist Self-Efficacy Scale

The telehealth age presents new challenges for DPT student learners' self-efficacy and confidence in healthcare settings (Campbell et al., 2022). The New General Self-Efficacy (Chen et al., 2001) scale was developed as a revision to the original General Self-Efficacy Scale, with content validity compared to Sherer et al.'s General Self-Efficacy Scale, to assess individuals' perceptions of their ability to perform in a variety of situations (Sherer et al., 1982). The New General Self-Efficacy Scale was used to validate the 5-item Physical Therapist Self-Efficacy (PTSE) scale, which assesses clinical reasoning self-efficacy (Venskus & Craig, 2017; Chen et al., 2001). Administering the PTSE during telehealth and conventional clinical experiences may improve comprehension of the self-efficacy of DPT students when it applies to clinical reasoning (van Lankveld et al., 2017). When performing patient assessment in the context of the PCM model, physical therapists' performance may be evaluated using three PTSE variable items (1) performance of tests and measures, (2) determining when to refer to another practitioner, and (3) screening for primary medical disease (Stucki et al., 2007; Venskus & Craig, 2017). The aim of this study was to compare DPT students' self-efficacy with clinical reasoning performing patient assessment using the PCM model examination component to compare telehealth with conventional examination.

Methods

Ethical Statement

Exempt status for this research project to investigate DPT students from a single, private multi-campus university during Fall 2020 clinical experiences in the United States was approved by the institutional review boards of two collaborating universities.

Participants

During the Fall 2020 clinical experiences, a web survey instrument link was sent to 725 second and third year DPT students' email addresses from the institution under investigation. Respondents first read a survey description before providing informed permission and accessing the survey. Only DPT students on integrated clinical experiences (second year of didactic curriculum) or terminal clinical experiences (third year after didactic curriculum completion) who provided telehealth and conventional examinations during their clinical experiences were included. DPT students who were not on clinical rotations were not permitted to participate (Campbell et al., 2022). Of the 211 responses received, 35 acknowledged providing both telehealth and conventional examination. A total of 35 DPT student respondents were included in the results. The flow diagram of the progress through the phases of the repeated measures design of the group exposed to both telehealth and conventional examination is depicted in Figure 1.

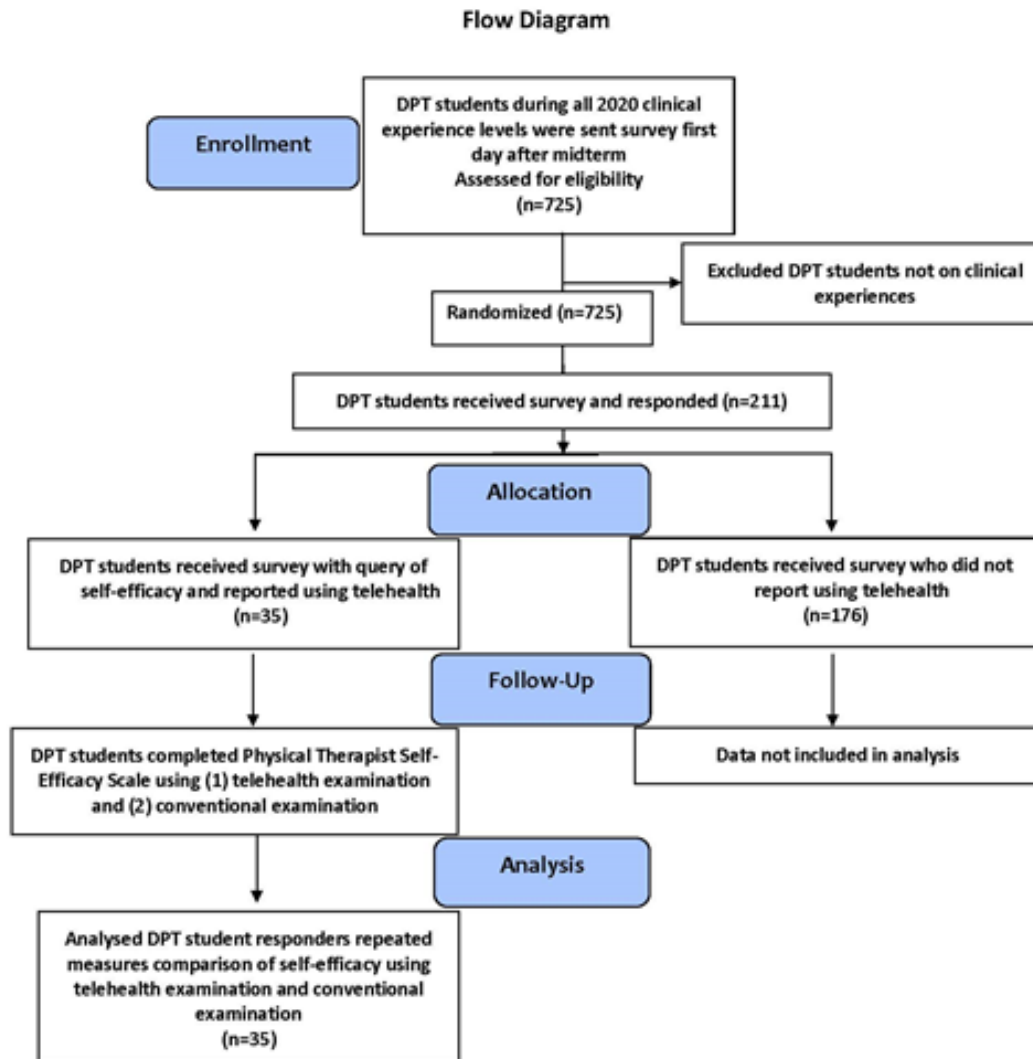


Figure 1. Flow diagram of the progress through DPT students' repeated measures comparison of self-efficacy of telehealth and conventional PCM model examination

Technical Information

An electronic survey was developed using concepts from published studies on physical therapy self-efficacy. Embedded in the survey was the 5-item Physical Therapist Self-Efficacy scale to assess DPT students' clinical reasoning self-efficacy (Venskus & Craig, 2017; van Lankveld et al., 2017). Three experts knowledgeable in survey method and publication records reviewed the survey. A graduating cohort of DPT students ($n=30$) from the primary investigator's institution pilot tested the survey for question clarity, feasibility, and reliability (Campbell et al., 2022). Students who participated in the pilot testing were not included in the study.

During the Fall 2020 clinical experiences, surveys were distributed after midterm and were completed by respondents

anonymously using SurveyMonkey® software (www.surveymonkey.com). There were no incentives for respondents to participate. Personal identifying information was redacted from all data before it was analyzed by the main investigator. The checklist for Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) was completed. (Vandenbroucke et al., 2007; Campbell et al., 2022).

Participants answered up to 28 questions. The survey began with demographic questions and then inquired about comfort and confidence in using telehealth technology during clinical visits. The Physical Therapist Self-Efficacy scale then asked participants to evaluate their self-efficacy with clinical reasoning during their clinical experiences on a 5-point Likert scale ("strongly disagree" to "strongly agree") (Venskus & Craig, 2017). If the participants indicated they had examined patients using telehealth, they

proceeded to the final portion of the survey. The survey ended if participants indicated that they did not evaluate patients using telehealth. For respondents who proceeded to the final portion of the survey, participants were asked how many telehealth visits they had done with less than 50% clinical instructor supervision. Finally, the PTSE scale was administered again to participants, who were asked to evaluate themselves during telehealth clinical experiences (Campbell et al., 2022).

Data Analysis

Data were analyzed using Excel version 2016 and SPSS Version 28.0. Descriptive statistics summarized the distribution, central tendency, and dispersion of responses. Wilcoxon signed-ranks tests evaluated repeated measures within-subject difference in DPT students' scores on the Physical Therapist Self-Efficacy Scale during clinical experiences with (1) telehealth and (2) conventional examination. The significance level was set at $P=0.05$. The total clinical reasoning self-efficacy variable ranged from 0 if they reported "Strongly disagree" on the clinical reasoning questions to 20 if they reported "Strongly agree" on the clinical reasoning questions. These categories had a Cronbach's alpha coefficient of .87 with telehealth examination and .80 without, indicating good internal consistency. (DeVellis, 2016; Campbell et al., 2022).

Results

Demographics of Survey Respondents

A total of 35 DPT students (62.9% of whom were female) completed the survey. The respondents included 29 third year DPT students who had already completed one clinical experience without telehealth and six second year DPT students who were undergoing their first clinical experience. Orthopedics was the main clinical practice area for most respondents (71.4%), and outpatient clinics were the primary clinical practice setting (88.6%). The PTSE value is a number between 0 and 20. The mean PTSE score for the respondent was 13.1 for the telehealth examination and 15.5 for the conventional exam. Table 1 lists the demographics of DPT responses (Campbell et al., 2022).

Table 1. DPT student respondents' demographics

Characteristic	Count (%)
Age in years, [SD]	28.1 [4.2] ^a
Gender	
• Female	22 (62.9)
• Male	13 (37.1)
Year of Curriculum	
• Second (Integrated Clinical Experience)	6 (17.1)
• Third (Terminal Clinical Experience I/II)	29 (82.9)
Race/ Ethnicity	
• American Indian or Alaskan Native	1 (2.9)
• Asian/Pacific Islander	11 (31.4)
• Black or African American	3 (8.6)

Characteristic	Count (%)
• Hispanic	3 (8.6)
• White Caucasian	16 (45.7)
• Prefer not to answer	0 (0)
• Multiple Ethnicity / other	1 (2.9)
Area of Clinical Practice	
• Orthopedics	25 (71.4)
• Neurorehabilitation	4 (11.4)
• Other	6 (17.1)
Practice Setting	
• Outpatient Clinic	31 (88.6)
• Inpatient Rehabilitation Facility	4 (11.4)
PTSE telehealth \bar{x} [SD; Md, Range]	13.1 [2.3, 14.0, 4-16]
PTSE conventional \bar{x} [SD; Md, Range]	15.5 [2.2, 15.0, 7-20]

Legend: ^aSD – standard deviation; \bar{x} – mean; Md – median

Knowing When to Perform Special Tests and Measures

The Wilcoxon signed-rank test revealed lower PTSE scores for telehealth on the item "I am confident that I know when to perform specific tests for physical therapist practice," ($z = -3.947$, $n = 35$, $P < 0.001$, effect size = .67). The mean sum rank on the PTSE was also lower for telehealth examination (Mean = 2.69, Median (Md) = 3.0, SD = .68) than conventional examination [(Mean = 3.29, Md = 3.0, SD = .67) (Figure 2)]. Table 2 displays inferential analysis of results.

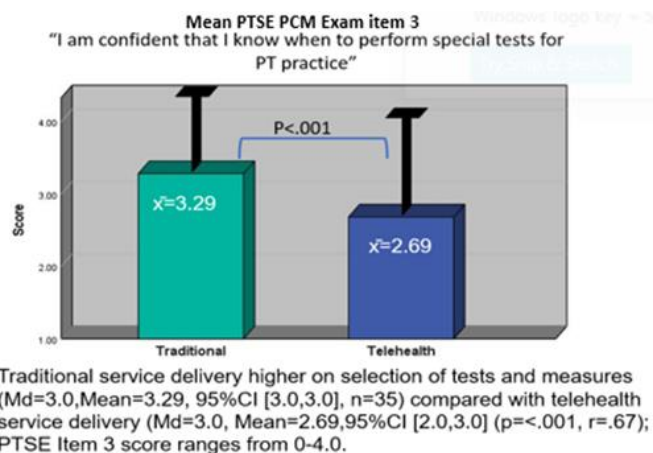


Figure 2. DPT students' mean PTSE exam item scores on performance of special tests and measures

Knowing When to Refer a Patient to Other Healthcare Practitioner

The Wilcoxon signed-rank test revealed lower PTSE scores for telehealth on the item "I will know when it's time to refer a patient problem to another practitioner," ($z = -3.827$, $n = 35$, $P < 0.001$, effect size = .65). The mean sum rank on the PTSE was also lower

for telehealth examination (Mean = 2.51, Md = 3.0, SD = .82) than conventional examination [(Mean = 3.11, Md = 3.0, SD = .58) (Figure 3, Table 2)].

confident that I would not miss primary medical disease,” (z = -3.119, n = 35, P <0.001, effect size = .53).

The mean sum rank on the PTSE was also lower for telehealth examination (Mean = 2.56, Md = 3.0, SD = .85) than conventional examination [(Mean = 2.94, Md = 3.0, SD = .73) (Figure 4, Table 2)].

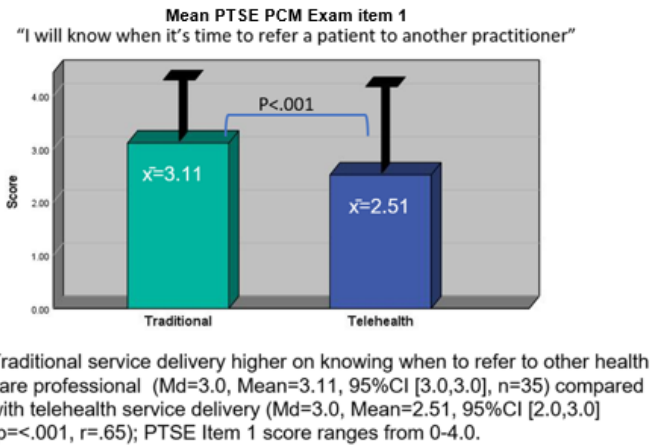


Figure 3. DPT students’ mean PTSE exam item score on knowing when to refer to other health care practitioner

Medical Screening for Primary Disease

Wilcoxon signed-rank test revealed lower PTSE scores for telehealth on the item “In a general physical therapy context, I am

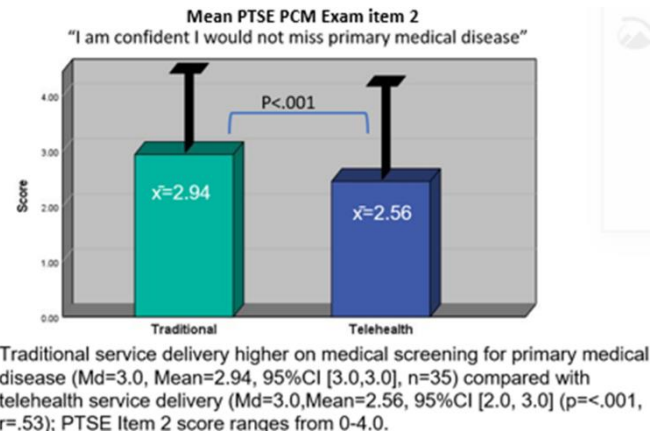


Figure 4. DPT students’ mean PTSE exam item score on medical screening for primary medical disease

Table 2. Wilcoxon-Sign Ranks Test PTSE Examination Item Summary

	Telehealth	Conventional	P-value
PTSE 5-item	Md 14.0 95% CI [12, 15]	Md 15.0 95% CI [14,16]	<math>< 0.001^*</math>
Performance of tests and measures	Md 3.0 95% CI [2.0,3.0]	Md 3.0 95% CI [3.0,3.0]	<math>< 0.001^*</math>
Knowing when to refer to other healthcare practitioner	Md 3.0 95% CI [2.0,3.0]	Md 3.0 95% CI [3.0,3.0]	<math>< 0.001^*</math>
Medical screening for primary disease	Md 3.0 95% CI [2.0,3.0]	Md 3.0 95% CI [3.0,3.0]	<math>< 0.001^*</math>

Legend: Md=median
95% CI=confidence interval; *P < 0.05, achieved statistical significance.

Second vs. Third-year Students

To determine if there was a difference between second and third-year students, a Mann Whitney U Test revealed no significant difference in the sum of Physical Therapist Self-Efficacy (PTSE) questions score patient assessment items between second (Md= 9.0, n = 6) and third-year students (Md = 9.0, n = 29, U = 73, z = .403, p = .723).

Discussion

The COVID-19 pandemic changed the clinical experiences of Doctor of Physical Therapy (DPT) students from face-to-face interactions to telehealth interactions (APTA.org, 2020; Fisk et al., 2020). According to social distancing guidelines, physical therapists had to create new patient care procedures and

frequently use new technology for remote care (Yonter et al., 2020; Elor et al., 2022).

Telehealth is a well-defined and established method of providing health services according to the APTA, and supports advancement of physical therapy telehealth practice, education, and research to improve the quality and accessibility of physical therapist services (APTA, 2019; Elor et al., 2022).

Telehealth has the potential to improve satisfaction among patients, remove barriers to physical therapy services, and lower societal costs associated with physical rehabilitation (Lee et al., 2018). However, little is known regarding its role in physical therapist education and its impact on DPT student self-efficacy when conducting patient assessment in the context of the PCM model (Hong et al., 2020).

This study builds on a previous investigation into DPT students' self-efficacy in performing telehealth PCM model examinations in several primary areas of clinical practice and practice settings in the United States (Campbell et al., 2022).

The aim of this study was to compare DPT students' self-efficacy performing telehealth examination compared with conventional examination using three PTSE items: 1) performance of tests and measures, (2) determining when to refer to another practitioner, and (3) screening for primary medical disease (Venskus & Craig, 2017; Campbell et al., 2022). DPT students reported lower PTSE scores when comparing telehealth with conventional examination for selection of special tests and measurements to perform physical therapy practice. This implies that students' self-efficacy in the performance of special tests and measurements may be diminished if they are unable to employ their senses of touch for palpation, smell for observation of constitutional signs of infection, and local monitoring systems.

Accurate DPT student screening for referral is important because the trend toward direct access for the profession has meant the partial elimination of the physician referral mandated by state law to access physical therapist services for evaluation and treatment (APTA.org, 2022; Hon et al., 2021). When comparing telehealth to conventional examination element of screening to “know” or determine when to refer a patient problem to another practitioner, DPT students reported lower PTSE scores. This may imply that students' self-efficacy in performing screening referral to another healthcare practitioner over telehealth is lower due to little opportunity during didactic and clinical curriculum. Lastly, when comparing telehealth to conventional examination elements of screening for primary medical disease, DPT students reported lower PTSE scores. This could be a result of gaps in the didactic and clinical curriculum as it relates to telehealth screening examination. Intentional planning for telehealth examination opportunities during didactic and clinical experience curriculum may promote self-efficacy in DPT students. Future studies should explore the location, timing, and content of telehealth examinations in entry-level physical therapist education programs to examine the correlates and causes of DPT students' self-efficacy.

The findings indicate lower DPT student self-efficacy when performing telehealth patient assessments compared to conventional patient assessments. This is consistent with previous literature demonstrating lower DPT student telehealth compared with conventional treatment self-efficacy and confidence (Campbell et al., 2022). The necessity for fostering physical therapy students' self-efficacy with examination has increased due to telehealth growth (APTA.org, 2022; APTA.org, 2012). There was no significant difference in the sum of Physical Therapist Self-Efficacy (PTSE) questions scores between second and third-year students. This suggests comparable perceptions on the use of telehealth examination between second and third year students. The response data were sufficient to infer acceptable findings because the study recruited all DPT students from a multi-campus

university during all clinical experience levels in Fall 2020, at the height of telehealth use during the COVID-19 pandemic (Guide, 2003).

Limitations

The study's inability to draw conclusions about causality from the educational process is one of its limitations. Additionally, future research may reduce potential survey bias by randomizing the PTSE allocation query between telehealth and conventional examination. The survey received a disproportionately high number of responses from orthopedic primary care areas and outpatient clinic practice settings because of the study period during Fall 2020- of the COVID-19 pandemic. This may have an impact on the study's generalizability. To ensure the reliability of our findings, conducting a similar study with a larger sample size from both public and private universities and with greater representation of practice settings is recommended.

Implications for Practice

According to the study, self-efficacy in telehealth examination performance is lower in DPT students than it is for conventional examination. Before beginning clinical experiences, DPT students should demonstrate their clinical reasoning self-efficacy by performing both telehealth and traditional examinations (APTA.org, 2012; Stern & Rosenthal, 2020). The Physical Therapist Self-Efficacy tool can be used to identify students who are less confident in their ability to make clinical decisions during telehealth examinations and offer them the chance to improve both before and after clinical experiences (Venskus & Craig, 2017; Musolino & Jensen, 2020; Campbell et al., 2022). Understanding the impact on DPT student clinical reasoning self-efficacy with telehealth examination is important for developing best practices because the future footprint of telehealth in entry-level physical therapist education programs is anticipated to grow. The importance of academic instructors understanding physical therapy students' perspectives on clinical decision-making and clinical skill self-efficacy before, and throughout clinical experiences is emphasized by our study.

Conclusion

Exploring how DPT students in entry-level physical therapist education programs conduct telehealth examinations may assist academic curricula in recommending best practices for promoting clinical preparedness. Findings suggest a need to identify educational strategies that enhance DPT student self-efficacy with telehealth examination. Examining telehealth content and sequence in entry-level physical therapist education programs' curriculum may help students feel more prepared for performing telehealth examination. To better prepare DPT students for clinical experiences, we recommend identifying variables that support best practice for telehealth examination.

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