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ORIGINAL RESEARCH ARTICLE

Comparison of Flex vs. residential clinical education program outcomes: physical therapy students' self-efficacy, confidence, and clinical competence

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Abstract

Purpose: Alternative flexible (Flex) path Doctor of Physical Therapy (DPT) programs may have an emerging footprint. The differences between Flex and traditional residential DPT program clinical experience outcomes remain unknown. The purpose of this study was to evaluate Flex and residential DPT students' clinical reasoning self-efficacy, confidence with treating, and Clinical Performance Instrument (CPI) clinical reasoning and summative scores during clinical experiences.

Methods: A descriptive and exploratory cross-sectional survey was used with a voluntary convenience sample of 211 university DPT students during Fall 2020 full-time clinical experiences. Descriptive and inferential statistics evaluated differences in Flex and residential DPT program students' (1) Physical Therapist Self-Efficacy (PTSE) scale scores, (2) confidence with treating initial and subsequent same-patient visits, and (3) final CPI clinical reasoning and summative scores during clinical experiences.

Results: Mean PTSE scores were significantly lower for Flex ($\bar{x} = 14.2$) compared to residential DPT students ($\bar{x} = 15.2$) ($P < 0.05$). No significant student differences were found in (1) Flex ($\bar{x} = 2.1$) and residential ($\bar{x} = 2.2$) confidence with treating at the initial visit ($P = 0.59$), (2) Flex ($\bar{x} = 2.8$) and residential ($\bar{x} = 3.0$) confidence with treating subsequent same-patient visits ($P = 0.15$), and (3) Flex ($\bar{x} = 15.8$) and residential ($\bar{x} = 16.5$) CPI clinical reasoning ($P = 0.17$), and (4) Flex ($\bar{x} = 16.1$) and residential ($\bar{x} = 16.7$) CPI summative scores ($P = 0.21$).

Conclusion: Clinical reasoning self-efficacy among Flex DPT students was lower, but there was no difference in CPI clinical reasoning or summative results between Flex and residential DPT students. In the university investigated, the Flex distance learning DPT program curriculum appeared effective in preparing students' clinical reasoning readiness for the available full-time clinical experiences. We recommend academic institutions consider expanding Flex entry-level DPT program availability options because the outcomes were comparable. Additional flex entry programs may help address the underrepresentation of nontraditional students in entry-level DPT programs and societal demands for physical therapy services.

Keywords: *clinical performance; flexible program; confidence; self-efficacy; hybrid*

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Alternative flexible (Flex) path entry-level Doctor of Physical Therapy (DPT) education programs may have an emerging footprint. The Flex DPT program format combines online education and weekend labs on campus in an extended

curriculum aimed for nontraditional students who are unable to attend classes on campus during the week per the traditional residential DPT program schedule.¹ The Flex DPT program affords a flexible path curriculum to let nontraditional students meet personal and family

financial obligations while pursuing physical therapy as a career change.¹

According to the US Bureau of Labor Statistics, the projected percent change in physical therapist employment from 2020 to 2030 is expected to be 21%, higher than the 8% average growth rate for all occupations for professions.² There is a growing need for increased representation of nontraditional students in entry-level DPT programs to close societal demographic disparity.³ In one multicampus university system with Flex program offering, nontraditional DPT student ethnic representation of 38.3% was greater than the 26% reported by the Commission on Accreditation of Physical Therapy Education (CAPTE) aggregate data for entry-level physical therapy programs across the United States.⁴ The traditional face-to-face classroom and popular hybrid weekday models may not match the roadmap required by nontraditional students for professional entry to address the projected workforce demand for physical therapists.^{5,6}

The American Physical Therapy Association (APTA) outlines a call to action to increase the representation of providers from diverse populations and backgrounds who have the ‘requisite knowledge, skills, and attitudes to meet societal need for physical therapy services’.⁷ The Flex DPT program may provide increased opportunities for diversity, equity, and inclusion to align with the APTA goal of having a profession reflecting the patient population it serves.^{8,9} Flex students often come to class equipped with a great amount of life experiences.¹⁰ Additionally, nontraditional students tend to be very self-directed and prefer functional task-oriented learning to subject-oriented coursework.¹¹ Reasons students cited as benefits of alternative Flex path entry include working while preparing for career change, military duty, and parental responsibilities.^{1,10}

One key to a successful clinical experience is the skill and self-efficacy to adapt to changing conditions in the clinic.^{3,12} Self-efficacy is an accurate predictor of behavior and clinical performance and has a stronger association with achievement than either past experiences or outcome expectancies.^{13,14} Understanding student beliefs and perceptions that promote clinical reasoning self-efficacy during clinical experiences of Flex and residential program students may allow DPT programs to better cultivate students’ clinical reasoning with educational strategies to promote clinical performance.^{15–17} An examination of the literature yielded no information on whether clinical reasoning, self-efficacy, and confidence of DPT students in Flex and residential programs differ. It is unknown if the extended timeline before entering full-time clinical experiences for Flex students may affect their clinical reasoning self-efficacy and confidence compared to residential DPT students.¹⁰

The 5-item Physical Therapist Self-Efficacy (PTSE) scale was developed for measuring clinical reasoning

self-efficacy and was validated in reference to the New General Self-Efficacy Scale.^{8,18} Self-efficacy is considered an important factor for DPT student performance in clinical settings.^{19,20} The PTSE use may increase the understanding of Flex compared to residential program DPT students’ clinical reasoning self-efficacy during full-time clinical experiences.

In the United States, the APTA Clinical Performance Instrument (CPI) is widely used as a valid and reliable tool for clinical instructors to rate DPT students’ clinical performance.²¹ DPT students provide reflection on self-efficacy and self-confidence when completing the CPI assessment during clinical experiences. The development, revision, and success of Flex DPT programs may be aided by research on student performance results in full-time clinical experiences, which is lacking in Flex DPT programs. Such research could have a significant impact on educators and accrediting organizations. Evaluating the relationship between Flex and residential program DPT students’ PTSE and CPI performance ratings across primary clinical practice areas and settings may provide useful information to guide clinical education stakeholders’ decision-making on where to concentrate academic resources to best promote DPT students’ clinical reasoning self-efficacy.

It is unknown whether students in the extended 4-year (12-trimester) Flex entry-level physical therapy programs achieve the same final CPI clinical reasoning and summative scores during clinical experiences as 3-year (8-trimester) residential programs. The purpose of this study was to evaluate if differences existed between Flex and residential DPT students’ clinical reasoning self-efficacy, self-confidence with treating, and CPI clinical reasoning and summative scores during full-time clinical experiences.

Methods

Design

This study involves a descriptive and exploratory cross-sectional design survey. The Institutional Review Boards of two collaborating universities approved exempt status for this research project to investigate DPT students from one single, multicampus university, during Fall 2020 full-time clinical experiences (IRB #: L20-211).

Subjects

A web survey instrument link was sent to 102 Flex and 623 residential program DPT students’ email addresses from one large, multicampus university under investigation during Fall 2020 full-time clinical experience levels. Levels included integrated clinical experiences (6-week) during the 2nd year of the residential didactic curriculum and the 3rd year of the Flex didactic curriculum, and terminal clinical experiences (12-week) at the completion of both didactic curricula. Responders first read a survey

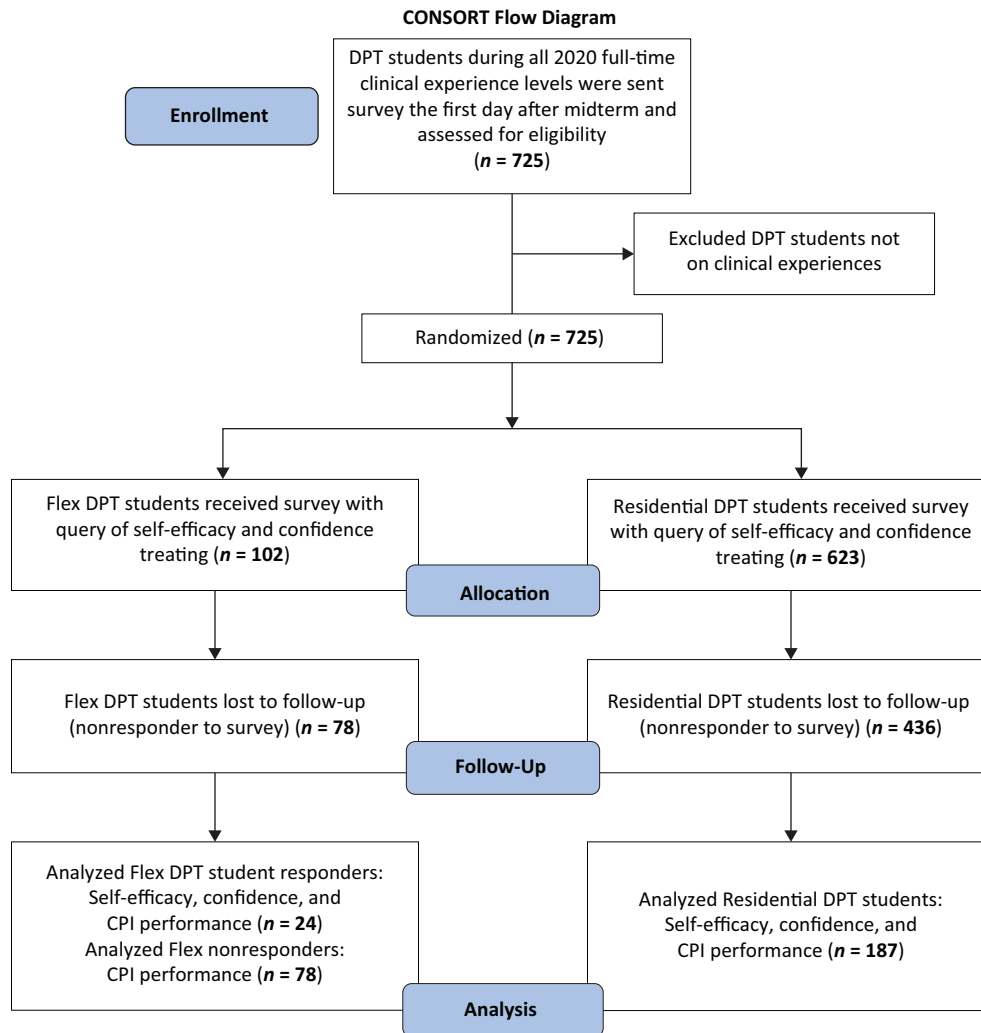


Fig. 1. CONSORT flow diagram of the progress through the phases of Flex and residential DPT student groups (i.e. enrollment, intervention allocation, follow-up, and data analysis). CPI, Clinical Performance Instrument; DPT, Doctor of Physical Therapy.

description and had the opportunity to provide informed consent and access the survey. Only DPT students on clinical experiences were included. DPT students not on clinical experiences were excluded from participating. The CONSORT flow diagram illustrates the progress through the phases of Flex and residential DPT student groups enrollment, survey allocation, follow-up, and data analysis (Fig. 1).²²

Procedures

We developed an electronic survey questionnaire using concepts from published studies on physical therapy self-efficacy and embedded the 5-item PTSE scale to assess DPT students' clinical reasoning self-efficacy (Appendix 1).^{17,23} The survey was reviewed by three experts knowledgeable in survey methodology and publication records. A graduating cohort of DPT students ($n = 30$)

from the primary investigator's institution pilot tested the survey for question clarity, feasibility, and reliability. The internal pilot intraclass correlation coefficient of 0.829 in this study, based on the 95% confidence interval, indicated survey reliability.

Surveys were administered to 725 DPT students one day after the midterm during their Fall 2020 full-time clinical experience and completed via SurveyMonkey software (www.surveymonkey.com). Responders received no incentives for participation. Nonresponders who elected not to participate did not sustain any consequences. A university research assistant linked the survey data with the final Fall 2020 CPI clinical reasoning (1-item) and summative (18-item) clinical instructor rating scores from the APTA PT CPI-web for all respondents.^{17,18,22-25} Personal identifying information was removed from all data prior to being handled by the primary investigator

for data analysis. CPI data were available from Flex DPT nonresponders for program quality improvement. The Strengthening the Reporting of Observational studies in Epidemiology (STROBE) checklist was completed.²⁶

Each participant received the survey during one clinical experience and could respond once only to a maximum of 20 questions. The survey first presented demographic questions. The DPT students were asked how confident they were treating patients during initial and subsequent visits. The next survey section consisted of the 5-item PTSE scale, with 5-point Likert scales requiring participants to rate the level of agreement with a query of clinical reasoning self-efficacy in physical therapy during their clinical experiences from 'strongly disagree' to 'strongly agree'.¹⁸

Data analysis

Data were analyzed using Excel version 2016 and SPSS Version 28.0. Descriptive statistics were used to summarize the distribution, central tendency, and dispersion of responses.²⁷ Mann-Whitney U tests were used to evaluate the difference in Flex and residential DPT students' PTSE, and CPI clinical reasoning and summative scores during clinical

experiences. Significance was set at $\alpha = 0.05$. Scores from the 5-item PTSE scale questions were summed with reference to previous literature to provide a total clinical reasoning self-efficacy variable ranging from 0 if they reported 'Strongly disagree' to 20 if they reported 'Strongly agree' on the clinical reasoning questions.¹⁶ These items had a Cronbach's alpha coefficient of 0.80, demonstrating good internal consistency.²⁸ The intraclass correlation coefficient of 0.829 in this study, based on the 95% confidence interval, indicated survey reliability.

Results

A total of 211 DPT students ($n = 24$ Flex DPT program; $n = 187$ residential DPT program) completed the survey (Flex response rate = 24%; residential response rate 30%). Additionally, 78 Flex DPT student nonresponders completed the survey for their Fall 2020 full-time clinical experiences, CPI, clinical practice area, and clinical practice setting. The largest proportion of the 211 DPT student responders reported their primary area of clinical practice as orthopedics (82.9%) and their primary clinical practice setting as an outpatient clinic (85.7%). Responder and

Table 1. Demographic data of Flex DPT program responders, nonresponders, and residential DPT program responders

Characteristic	Count (percentages)					
	Flex (responders) $n = 24$		Flex (nonresponders) $n = 78$		Residential (responders) $n = 187$	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Age in years, [SD]	30.1	4.2	n/a	n/a	27	3.3
Gender			n/a	n/a		
Female	16	66.7	–	–	124	66.3
Male	8	33.3	–	–	63	33.7
Academic GPA mean range [SD]	3.30–3.39*		–	–	3.40–3.49*	
Area of clinical practice						
Orthopedics	19	79.2	61	78.2	156	73.9
Neurorehabilitation	1	4.2	6	7.6	14	6.6
Other	4	16.7	11	14.1	18	8.5
Practice setting						
Outpatient clinic	20	83.3	62	79.4	161	76.3
Home health	–	–	2	2.5	1	0.5
Skilled nursing facility	3	12.5	3	3.8	1	0.5
Inpatient hospital	–	–	3	3.8	9	4.8
Inpatient rehabilitation facility	1	4.2	4	5.1	10	4.7
Other	–	–	4	5.1	5	2.7
Race/ethnicity			n/a	n/a		
American Indian or Alaskan Native	–	–	–	–	2	0.9
Asian/Pacific Islander	3	12.5	–	–	32	17.1
Black or African American	4	16.7	–	–	14	7.5
Hispanic	2	8.3	–	–	19	10.2
White Caucasian	13	54.2	–	–	108	57.8
Prefer not to answer	1	4.2	–	–	7	3.7
Multiple ethnicity/other	1	4.2	–	–	5	2.7

SD, standard deviation; n/a, data not available for nonresponders; DPT, Doctor of Physical Therapy. *represents mean.

available nonresponder demographic characteristics are shown in Table 1.

The PTSE score ranges from 0 to 20. Fig. 2 displays perceived DPT students' clinical reasoning self-efficacy on the PTSE scale for Flex ($n = 24$) and residential ($n = 187$) students. Mann-Whitney U tests revealed that significant PTSE differences existed with residential students (Md = 15, 95% CI [15.0, 15.0], $n = 187$) compared to Flex students [(Md = 14, 95% CI [14.0, 15.0], $n = 24$) ($P < 0.05$)]. Respondents' mean PTSE score for Flex DPT students was 14.2 [IQR 13.3, 15], and the mean PTSE score for residential DPT students was 15.2 [IQR 14, 16] (Fig. 2).

The CPI scores range from 1 to 21, with 17 indicating entry-level performance and 21 indicating beyond entry-level performance. The mean Flex DPT responder students' ($n = 24$) clinical reasoning score was 15.8 [IQR 13, 17], and the summative mean CPI score was 16.1 [IQR 13.9, 17.8].²³ The mean Flex DPT nonresponder students' ($n = 78$) clinical reasoning score was 15.9 [IQR 13, 17.3], and the summative mean CPI score was 16.5 [IQR 14.5, 17.8].²³ The mean residential DPT students' clinical reasoning score was 16.5 [IQR 15, 18], and the summative mean CPI score was 16.7 [IQR 15.8, 18.2] (Fig. 3).

Mann-Whitney U tests revealed that no difference existed in self-confidence with treating between Flex (Md = 2.0, 95% CI [2.0, 2.0], $n = 24$) and residential students (Md = 2.0 95% CI [2.0, 2.0], $n = 187$) on initial patient visits ($P = 0.588$) and treating between Flex (Md = 3.0, 95% CI [3.0, 3.0], $n = 24$) and residential students (Md = 3.0, 95% CI [3.0, 3.0], $n = 187$) on subsequent patient visits ($P = 0.145$) (Fig. 4 and Table 2).

Mann-Whitney U tests revealed no significant difference in the CPI clinical reasoning score between Flex (Md = 17.0, 95% CI [13.0, 17.0] $n = 24$) and residential DPT students (17.0, 95% CI [17.0, 17.0] $n = 187$), $U = 1861$,

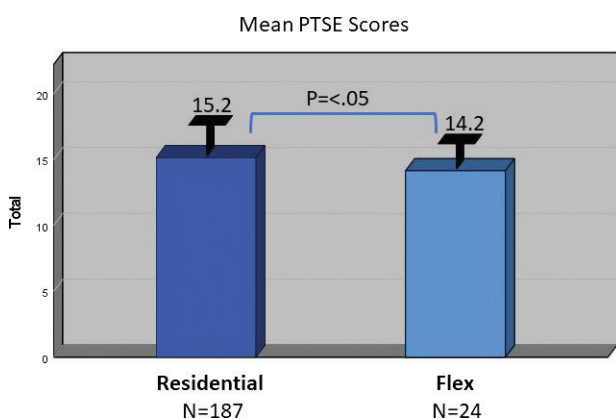


Fig. 2. PTSE scores for DPT residential (mean 15.2; median 15; SD 2.4) and Flex program responder students (mean 14.2; median 14; SD 2.0) ($P < 0.05$). Higher score on PTSE (maximum of 20) = higher self-efficacy. PTSE, Physical Therapist Self-Efficacy; DPT, Doctor of Physical Therapy.

$z = -1.388$, $P = 0.165$ (Table 2). Mann-Whitney U tests revealed no significant difference in the CPI summative score between Flex (Md = 16.9, 95% CI [14.1, 17.7] $n = 24$) and residential DPT students (Md = 17.0, 95% CI [17.0, 17.2] $n = 187$), $U = 1891$, $z = -1.254$, $P = 0.210$ (Table 2).

Mann-Whitney U tests revealed no significant difference in the CPI clinical reasoning score between Flex student responders (Md = 17.0, 95% CI [13.0, 17.0] $n = 24$) and nonresponders (Md 17.0, 95% CI [15.2, 16.6] $n = 78$), $U = 909.5$, $z = -213$, $P = 0.832$. Mann-Whitney U tests revealed no significant difference in the CPI summative score between Flex student responders (Md = 16.9, 95% CI [14.1, 17.7] $n = 24$) and nonresponders (Md = 17.0, 95% CI [15.9, 17.1] $n = 78$), $U = 855$, $z = -0.640$, $P = 0.552$ (Table 2).

Discussion

To the best of our knowledge, this was the first study to investigate Flex and traditional residential program DPT students' full-time clinical experience outcomes across selected primary clinical areas and practice settings in the United States. The aim was to evaluate if differences existed between Flex and residential DPT students' clinical reasoning self-efficacy, self-confidence with treating, and final CPI clinical reasoning and summative scores during full-time clinical experiences. Despite lower Flex DPT students' clinical reasoning self-efficacy, no difference existed between Flex and residential DPT program students' clinical performance on (1) CPI clinical reasoning and summative scores, and (2) self-confidence with treating on initial and subsequent same-patient visits.

The external validity of our findings was adequate as our sample was representative of United States DPT students. A chi-square goodness of fit test indicated (1) no significant difference in the proportion of gender identified in our sample (67.3% female) as compared with the proportions found in the 2019–2020 CAPTE Aggregate Program Data report description of DPT students enrolled in the United States (61.4% female) and (2) no significant difference in the proportion of 3rd- and 4th-year Flex compared to 2nd- and 3rd-year residential responders.²⁹ Additionally, our response rates (Flex and residential combined 29%; Flex 24%; and residential 30%) were higher than the minimal recommended college student survey response rate range (20–25%) to allow for increased confidence in survey estimates.^{9,30} Since we invited the entire multicampus population of enrolled university DPT students during full-time clinical experiences to participate in the survey, rather than a sample, we believe our response rate was sufficient to draw reasonable conclusions.

Our study was the first to evaluate the relationships between Flex and residential DPT students' clinical reasoning self-efficacy during full-time clinical experiences.

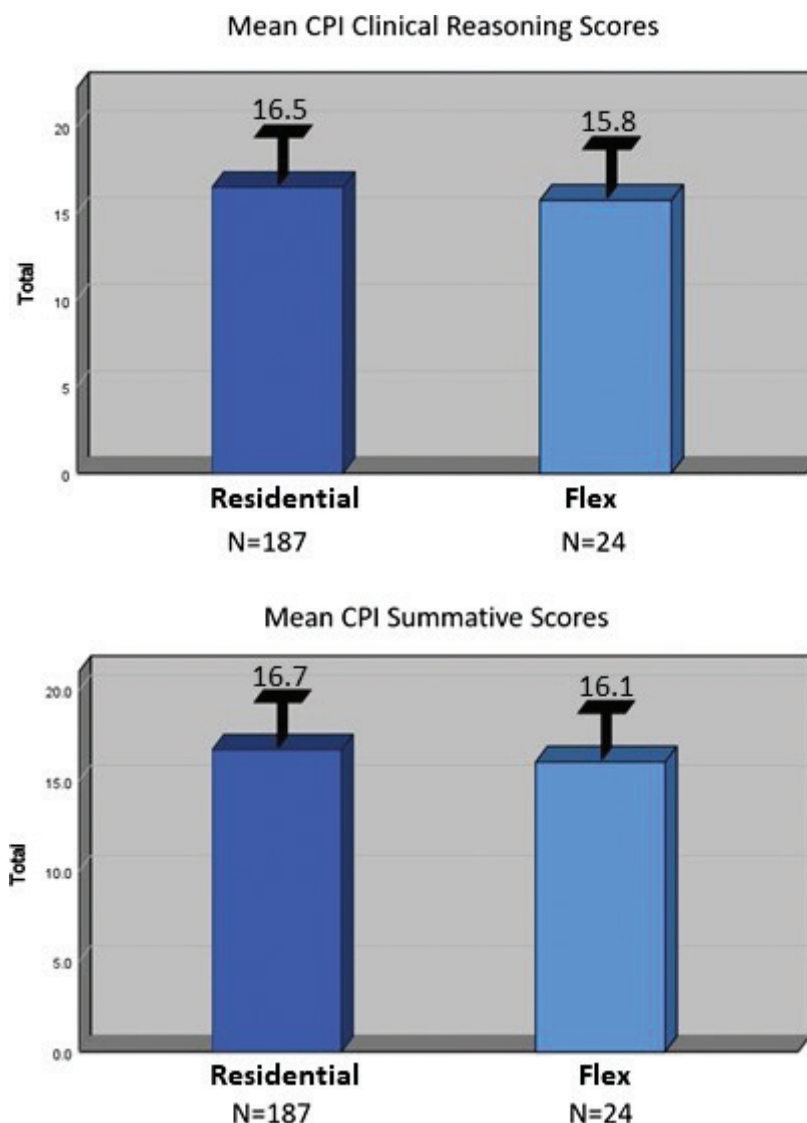


Fig. 3. (a) Clinical reasoning CPI scores for DPT residential (mean 16.5; median 17; SD 2.8) and Flex program responder students (mean 15.8; median 17; SD 2.9). (b) Summative CPI scores for DPT residential (mean 16.7; median 17; SD 2.5) and Flex program responder students (mean 16.1; median 16.9; SD 2.6). The CPI score ranges from 1 to 21, with 13–16 indicating advanced intermediate level, and 17 indicating entry level. CPI, Clinical Performance Instrument; PTSE, Physical Therapist Self-Efficacy; DPT, Doctor of Physical Therapy.

Self-efficacy plays an essential role in how DPT students think, act, and behave.^{9,31} Our study found lower clinical reasoning self-efficacy during Flex DPT students' clinical experiences (Md = 14) compared to residential DPT students (Md = 15) with small effect size.³² Lower Flex DPT students' PTSE scores may raise consideration to investigate the timing of clinical experiences in the curriculum.¹⁰ While our study was not designed to investigate the clinical significance of PTSE mean differences, future research should evaluate the minimal clinically important difference.⁹

Flex DPT students' confidence to treat was 75% on initial visits and 96% on subsequent same-patient visits,

nearly mirroring residential students' 74% on initial visits and 97% on subsequent same-patient visits. Despite lower clinical reasoning self-efficacy, Flex DPT students' clinical instructor CPI ratings were comparable to residential DPT students. While we investigated an extended 4-year Flex program, a gap in the literature remains comparing accelerated 2-year alternative hybrid DPT program full-time clinical experience outcomes to residential DPT full-time clinical experience outcomes.³² The alternative path Flex distance learning DPT program curriculum investigated appears effective in preparing students' clinical reasoning readiness for full-time clinical experiences.

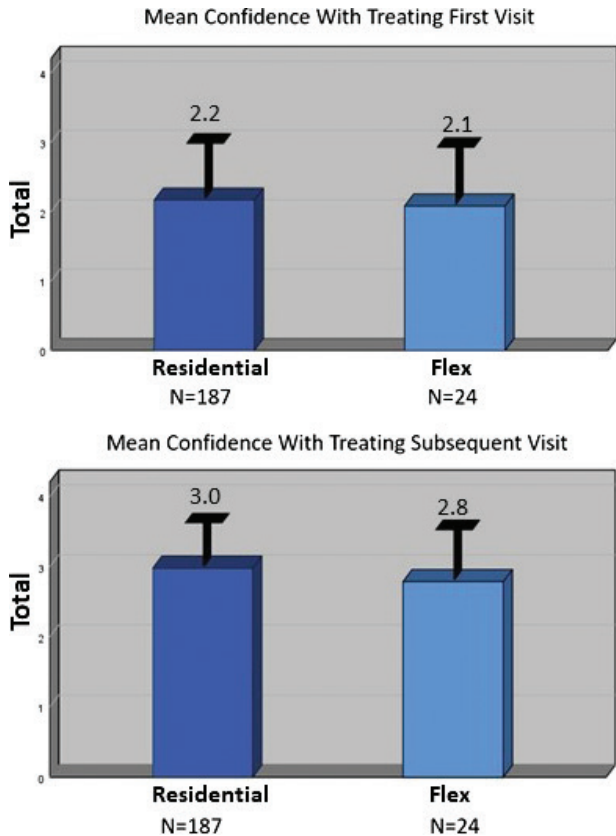


Fig. 4. (a) Mean confidence with treating initial first visit for DPT residential (mean 2.2; median 2.0; SD 0.79) and Flex program responder students (mean 2.1; median 2.0; SD 0.83). (b) Mean confidence with treating subsequent visits for DPT residential (mean 3.0; median 3.0; SD 0.63) and Flex program responder students (mean 2.8; median 3.0; SD 0.72). DPT, Doctor of Physical Therapy.

We recommend academic institutions consider expanding Flex entry-level DPT program availability options in an effort to address the underrepresentation of nontraditional students in entry-level DPT programs and societal demands for physical therapy services.

Limitations

There are several limitations of this study. The study was cross-sectional and included 24 responder and 78 nonresponder Flex DPT student program data from one university. We recognize that respondents may be biased when comparing conditions because they cannot know what they would have learned from other curricula. We recommend replicating the study with a larger sample to include several institutions to increase the external validity of the findings. Due to the study period during Fall 2020 of the COVID-19 pandemic, our survey had a disproportionately high number of orthopedic primary care area and outpatient clinic practice settings responses, which may impact the study’s overall generalizability.³³ We suggest conducting a follow-up study to see if the results can be generalized beyond the pandemic’s peak or if they were unique to the experience at the time of the study’s completion.

Implications for practice

Students are expected to demonstrate clinical reasoning competencies before entering clinical experiences.^{9,34} Use of the PTSE tool may identify students with lower clinical reasoning self-efficacy and provide remediation opportunities before and during full-time clinical experiences.⁹

With future growth projected in the US physical therapist workforce, there is impetus to increase nontraditional

Table 2. Analysis of differences between PTSE, confidence treating and CPI scores during clinical experiences of residential and flexible (Flex) DPT program students

	Residential (n = 187)			Flex (n = 24)			Mann-Whitney U test		
	Mean	SD	Md	Mean	SD	Md	U	z	P
PTSE	15.2	2.4	15	14.2	2.0	14	1,667	-2.083	<0.05*
Confidence initial	2.2	0.79	2.0	2.1	0.83	2.0	2,104	-0.542	0.588
Confidence subsequent	3.0	0.63	3.0	2.8	0.72	3.0	1,886	-1.457	0.145
CPI	Mean	SD	Md	Mean	SD	Md	U	z	P
Clinical reasoning	16.5	2.8	17	15.8	2.9	17.0	1,861	-1.388	0.165
Summative	16.7	2.5	17	16.1	2.6	16.9	1,891	-1.254	0.210
	Flex responders (n = 24)			Flex nonresponders (n = 78)					
CPI	Mean	SD	Md	Mean	SD	Md	U	z	P
Clinical reasoning	15.8	2.9	17	15.9	3.1	17.0	910	-213	0.832
Summative	16.1	2.6	16.9	16.5	2.6	17.0	1,891	0.855	0.522

*P < 0.05, achieved statistical significance; PTSE, Physical Therapist Self-Efficacy Scale; CPI, American Physical Therapy Association Clinical Performance Instrument; DPT, Doctor of Physical Therapy.

students' enrollment in entry-level DPT programs to meet societal demand. We recommend that academic institutions consider offering increased opportunities for alternative path entry into the physical therapy profession. Our study emphasizes the importance of Flex and residential DPT students' perceptions that contribute to clinical reasoning self-efficacy during full-time clinical experiences. We found lower student clinical reasoning self-efficacy with Flex DPT students; however, clinical performance and student confidence remained strong, reflecting preparation across years of Flex DPT curriculum.

Conclusion

Evaluating Flex compared to residential DPT program full-time clinical experience outcomes across the United States may better prepare alternative path entry-level physical therapy education curricula to prepare students for clinical experiences. Flex DPT students' clinical reasoning self-efficacy was reported as lower when compared to residential students during all full-time clinical experience levels. Despite lower clinical reasoning self-efficacy, Flex DPT students reported similar confidence levels when treating a patient at the initial visit and subsequent same-patient visits as residential students. We found no difference between Flex and residential DPT students' CPI clinical reasoning and summative scores during all clinical experience levels. The results may raise confidence with the current trend of Flex DPT education in entry-level physical therapy programs in the United States.

Conflict of interest and funding

The authors have not received any funding or benefits from industry or elsewhere to conduct this study.

IRB/Ethical Board approval and protocol number IRB #: L20-211.

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Appendix I

Appendix 1. Physical Therapist Self-Efficacy Scale for clinical reasoning

Scale	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
PTSE					
I am confident that I know when to perform specific tests for physical therapist practice.					
I will know when it is time to refer a patient/client problem to another practitioner.					
In a general physical therapy context, I am confident that I would not miss primary medical disease.					
I believe that I can manage general physical therapy problems.					
In a general physical therapy context, when facing a difficult case, I am certain I can make the right management decisions.					

Source: Venskus and Craig.¹⁸