Ethnicity Does Not Impact Physical Therapy Students' Clinical Readiness and Performance, a United States Exploratory Study

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Ethnicity Does Not Impact Physical Therapy Students' Clinical Readiness and Performance, a United States Exploratory Study

Abstract

Purpose: To explore the impact of ethnicity on clinical readiness and performance among Doctor of Physical Therapy (DPT) students, as determined by 1) Physical Therapist Self-Efficacy (PTSE) score, 2) self-confidence treating patients, and 3) final American Physical Therapy Association (APTA) Clinical Performance Instrument (CPI) clinical reasoning and summative ratings during clinical experiences. **Methods**: This study is a survey-based, descriptive, and exploratory cross-sectional research design involving sample of 211 DPT students evaluated for differences across ethnic students' groups 1) PTSE score during student clinical experiences, 2) confidence with treating initial and subsequent same-patient visits, and 3) final CPI clinical reasoning and summative scores during clinical experiences. **Results**: Kruskal-Wallis test showed no difference across ethnic groups (American Indian or Alaskan Native, Asian/ Pacific Islander, Black or African American, Hispanic, White or Caucasian, prefer not to answer, and multiple ethnicity) in 1) clinical reasoning self-efficacy (PTSE), n=211, p=.438; 2) confidence treating at initial visit n=211, p=.088 and subsequent patient visits n=211, p=.584; and 3) clinical performance on the CPI for clinical reasoning n=211, p=.273 and summative n=211, p=.189 scores. **Conclusions and Recommendations**: All ethnic groups demonstrated strong clinical readiness and performance during each clinical experience level. Ethnic groups did not differ on clinical reasoning self-efficacy or confidence treating patients. Although the gap appears to be closing, there continues to be underrepresentation of ethnic groups in DPT programs. We recommend investigating factors impacting underrepresentation of ethnic groups in DPT academic programs to explore initiatives to close the diversity gap and best match societal representation.

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Acknowledgements

contemporary practice.

Authors

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ABSTRACT

Purpose: To explore the impact of ethnicity on clinical readiness and performance among Doctor of Physical Therapy (DPT) students, as determined by 1) Physical Therapist Self-Efficacy (PTSE) score, 2) self-confidence treating patients, and 3) final American Physical Therapy Association (APTA) Clinical Performance Instrument (CPI) clinical reasoning and summative ratings during clinical experiences. **Methods:** This study is a survey-based, descriptive, and exploratory cross-sectional research design involving sample of 211 DPT students evaluated for differences across ethnic students' groups 1) PTSE score during student clinical experiences, 2) confidence with treating initial and subsequent same-patient visits, and 3) final CPI clinical reasoning and summative scores during clinical experiences. **Results:** Kruskal-Wallis test showed no difference across ethnic groups (American Indian or Alaskan Native, Asian/Pacific Islander, Black or African American, Hispanic, White or Caucasian, prefer not to answer, and multiple ethnicity) in 1) clinical reasoning self-efficacy (PTSE), n=211, p=.438; 2) confidence treating at initial visit n=211, p=.088 and subsequent patient visits n=211, p=.584; and 3) clinical performance on the CPI for clinical reasoning n=211, p=.273 and summative n=211, p=.189 scores. **Conclusions and Recommendations:** All ethnic groups demonstrated strong clinical readiness and performance during each clinical experience level. Ethnic groups did not differ on clinical reasoning self-efficacy or confidence treating patients. Although the gap appears to be closing, there continues to be underrepresentation of ethnic groups in DPT programs. We recommend investigating factors impacting underrepresentation of ethnic groups in DPT academic programs to explore initiatives to close the diversity gap and best match societal representation.

Keywords: clinical performance, confidence, decision-making, diversity.

INTRODUCTION

The American Physical Therapy Association (APTA) Diversity, Equity, and Inclusion (DEI) committee is charged with promoting diversity in entry-level physical therapy academic programs to ensure that the profession best meets the changing needs of society in the United States.[1] While physical therapy professional demographics continue to demonstrate increased DEI, there remains an underrepresentation of ethnic groups among United States entry-level Doctor of Physical Therapy (DPT) students preparing for clinical experiences.[2] Recommendations from the American Council of Academic Physical Therapy Clinical Education Summit addressed the need for consistent student preparation for varying levels of clinical experiences, depicted as "a requisite core set of knowledge, skills, attitudes and professional behaviors" culminating in clinical reasoning for each level of clinical experience.[3] Physical therapy students' clinical reasoning readiness is dependent on the students' self-efficacy, defined as beliefs or perceptions of how well they can execute courses of action required to deal with prospective situations.[4] Understanding physical therapy students' perceived clinical reasoning self-efficacy and confidence is essential to prepare them for successful clinical experiences.[5] It is unknown whether DPT students of different ethnicity display variations in clinical readiness and performance during clinical experiences.

Previous literature suggests variation across ethnic groups on clinical performance ratings by clinical instructors during clinical experiences.[6] Additional literature suggests the potential for bias in the evaluation of physical therapy students' clinical performance based on ethnicity; with those from underrepresented ethnic groups marked lower during clinical experiences.[7] Contrary to available literature, we hypothesized that among diverse ethnic groups during clinical experiences across the United States, there would be no difference in clinical reasoning readiness based on self-efficacy, confidence in treating patients, and clinical performance. The purpose of this study was to explore the impact of ethnicity on clinical readiness and performance among Doctor of Physical Therapy (DPT) students from a large, private, multi-campus university academic program in the United States.

METHODS

A descriptive and exploratory cross-sectional design survey study was devised. The Institutional Review Boards of two collaborating universities approved exempt status for this research project to investigate DPT students from one single multi-campus university during Fall 2020 clinical experiences in the United States(IRB #: L20-211).

Subjects

A web survey instrument link was sent to 725 second-and third year DPT students' email addresses from a large multi-campus university during Fall 2020 clinical experiences. Respondents first read a survey description and had the opportunity to provide informed consent and access the survey. Only DPT students during their integrated clinical experiences (second year of didactic curriculum) or terminal clinical experiences (third year of didactic curriculum) were included. DPT students not participating in a clinical experience were excluded from the study. A total of 211 DPT students (67% female) completed the survey (response rate=29.1%).

Instrument

We developed an electronic survey questionnaire using constructs from published studies on physical therapy self-efficacy and embedded the 5-item Physical Therapist Self-Efficacy scale to assess DPT students' clinical reasoning self-efficacy (Appendix 1).[8,9] Three experts knowledgeable in survey methodology and publication 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.

Surveys were administered after the midterm during Fall 2020 clinical experiences and completed anonymously via SurveyMonkey software (www.surveymonkey.com). Respondents received no incentives for participation. A university research assistant linked the anonymous survey data with final Fall 2020 Clinical Performance Instrument (CPI) clinical reasoning (1-item) and summative (18-item) scores from the APTA PT CPI-web for all respondents.[10,11] Personal identifying information was removed from all data prior to data analysis by the primary investigator. The Strengthening the Reporting of Observational Studies in Epidemiology checklist (STROBE) was completed (Appendix 2).[12]

Each participant could respond to a maximum of 28 questions. The survey began with demographic questions and inquired about comfort using technology during clinical experiences. Next, DPT students rated how confident they felt treating patients during initial and subsequent visits. Finally, participants completed the 5-item Physical Therapist Self-Efficacy scale, using a 5-point Likert scale ("strongly disagree" to "strongly agree") to rate their clinical reasoning self-efficacy during their clinical experiences.[8]

Data Analysis

Data were analyzed using Excel version 2016 and SPSS Version 26.0. Descriptive statistics summarized the distribution, central tendency, and dispersion of responses. Kruskal Wallis tests analyzed the differences across ethnic groups in 1) DPT students'

PTSE scores during clinical experiences, 2) self-confidence treating at initial and subsequent patient visits and 3) final CPI clinical reasoning (1-item)and summative (18-item) scores during clinical experiences. Significance was set at α=0.05.[13] Scores from the 5-item Physical Therapist Self-efficacy scale questions provided 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. The PTSE had a Cronbach's alpha coefficient of .87, demonstrating good internal consistency. Chi-Square test for independence indicated that our samples' ethnic distribution was not significantly different between students during integrated and terminal clinical experiences χ^2 (6, n=211) p=.53= Cramer's V=.16.[15]

RESULTS
Demographics including PTSE and CPI Scores of Survey Respondents
A total of 211 DPT students (67% female) completed the survey (response rate=29.1%) with responses received from 38 states across the United States. The largest proportion of respondents reported primary area of clinical practice as orthopedics (82.4%) and primary clinical practice setting as an outpatient clinic (85.8%).

The PTSE score ranges from 0 to 20. Respondents' mean PTSE score for clinical experiences was 15.1. The CPI score ranges from 1 to 21, with 17 indicating entry-level and 21 beyond entry-level performance.[13] The mean student clinical reasoning score was 16.4, and the summative mean CPI score across all clinical experience levels was 16.7. Table 1 displays respondents' demographic characteristics including PTSE and CPI scores. DPT students' confidence to treat was 74% on Place Table 1 here"

Table 1. Demographic data including PTSE and CPI scores of respondents (n = 211)

Characteristic	Count (percentages)
Age in years, [SD]	27.3 [3.6][a]
Gender	
o Female	142 (67.3)
o Male	69 (32.7)
Year of Curriculum	
o Second (Integrated Clinical Experience)	69 (32.7)
o Third (Terminal Clinical Experience I/II)	142 (67.3)
Race/ Ethnicity	
o American Indian or Alaskan Native	2 (1.0)
o Asian/Pacific Islander	35 (16.6)
o Black or African American	18 (8.5)
o Hispanic	21 (10)
o White Caucasian	121 (57.3)
o Prefer not to answer	8 (3.8)
o Multiple Ethnicity / other	6 (2.8)
Area of Clinical Practice	
o Orthopedics	174 (82.5)
o Neurorehabilitation	16 (7.6)
o Other	21 (10)
Practice Setting	
o Outpatient Clinic	181 (85.8)
o Home Health	1 (.5)
o Skilled Nursing Facility	1 (.5)
o Inpatient Hospital	12 (5.7)
o Inpatient Rehabilitation Facility	10 (4.7)
o Other	6 (2.8)
PTSE 1[b] [SD; Md, Range]	15.1 [2.3, 15.0, 7-20]
CPI Clinical Reasoning Score[c] [SD, Md, Range]	16.4 [2.8, 17.0, 5-21]
CPI Summative Score[c]	16.7 [2.6, 17.0, 6.8-21]

PTSE=Physical Therapist Self-Efficacy Scale; CPI=Clinical Performance Instrument; SD=Standard deviation; Md=Median
[a] Represents mean and standard deviation
[b] Higher PTSE score represents improved rating (Range 0-20)
[c] Higher CPI score represents improved rating (Range 1-21)

Clinical Reasoning Self-Efficacy
Figure 1 displays mean DPT students' clinical reasoning on the Physical Therapist Self-Efficacy Scale across all groups (n=211).
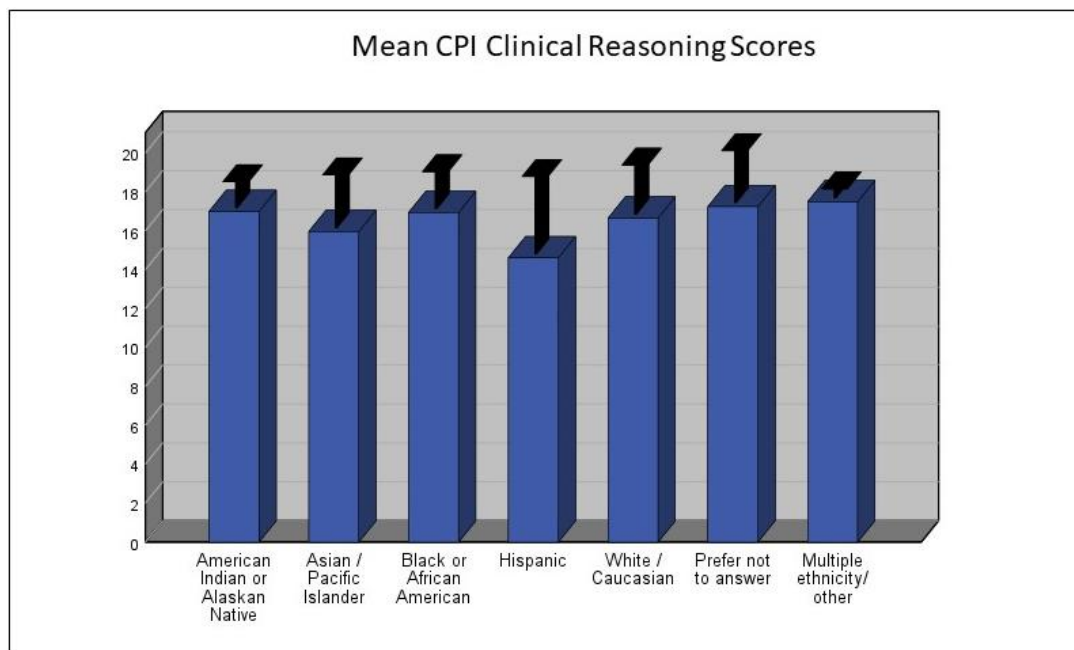

Figure 1. Figure 1. DPT students' clinical reasoning self-efficacy represented by mean PTSE scores across all ethnic groups

Kruskal-Wallis test showed no difference with clinical reasoning self-efficacy (PTSE) across ethnic groups (American Indian or Alaskan Native Md=15, 95% CI [14.0, 16.0], Asian/Pacific Islander Md=15, 95% CI [15.0, 15.0], Black or African American Md=15, 95% CI [14.0, 16.0], Hispanic Md=15, 95% CI [14.0, 17.0], White or Caucasian Md=15, 95% CI [15.0, 15.0] prefer not to answer Md=16.0, 95% CI [14.0, 20.0], and multiple ethnicity Md=14.5, 95% CI [12.0, 17.0]), χ^2 (6, n=211)=5.87, p=.438, r=.03. (

Table 2. Differences in physical therapy clinical reasoning self-efficacy (PTSE), confidence, and Clinical Performance (CPI) across ethnic groups during Clinical Experiences (n=211). (Figure 2 and Table 2)

Kruskal Wallis Test Summary	
Clinical reasoning self-efficiency	x^2(6, n=211)= 5.87, p=.438
Confidence in treating initial visit	x^2(6, n=211)= 11.01, p=.88
Confidence in treating subsequent visit	x^2(6, n=211)= 4.69, p=.584
CPI clinical reasoning ratings	x^2(6, n=211)= 7.55, p=.273
CPI summative ratings	x^2(6, n=211)= 8.74. [=.189

PTSE=Physical Therapist Self-Efficacy Scale; CPI=Clinical Performance Instrument.

Confidence Treating
Kruskal-Wallis test showed no difference across ethnic groups in confidence treating at initial visit χ^2 (6, n=211)=11.01, p=.088, r=.05, (American Indian or Alaskan Native Md=2.0, 95% CI [2.0, 2.0], Asian/Pacific Islander Md=2.0, 95% CI [2.0, 2.0], Black or African American Md=2.0, 95% CI [2.0, 3.0], Hispanic Md=2.0, 95% CI [2.0, 3.0], White or Caucasian Md=2.0, 95% CI [2.0, 2.0], prefer not to answer Md=2.5, 95% CI [2.0, 3.0], and multiple ethnicity Md=2.0), 95% CI [1.0, 2.0]); There was also no difference for subsequent patient visits χ^2 (6, n=211)=4.69, p=.584, r=.02, (American Indian or Alaskan Native Md=3.0, 95% CI [3.0, 3.0], Asian/Pacific Islander Md=3.0, 95% CI [3.0, 3.0], 95% CI [3.0, 3.0], Black or African American Md=3.0, 95% CI [3.0, 3.0], Hispanic Md=3.0, 95% CI [3.0, 4.0], White or Caucasian Md=3.0, 95% CI [3.0, 3.0], prefer not to answer Md=3.0, 95% CI [2.0, 4.0], and multiple ethnicity Md=3.0, 95% CI [2.0, 4.0]). (Table 2 and Figures 2a and 2b).
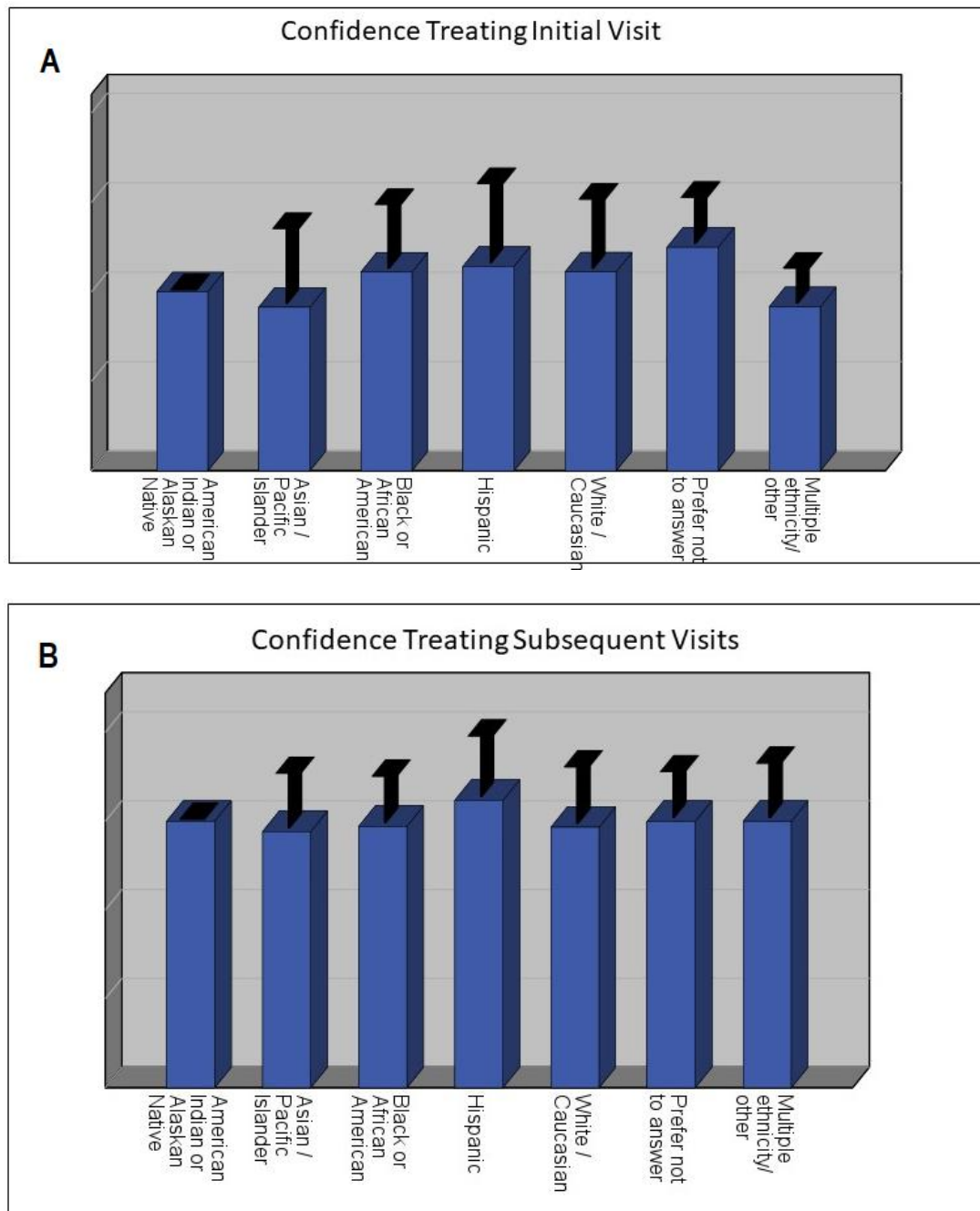
Figure(s) 2a and 2b. DPT student confidence treating across all ethnic groups showed no significant differences at initial patient visit and subsequent patient visits.

Clinical Performance Instrument Ratings

Kruskal-Wallis test showed no difference with clinical performance on the CPI across ethnic groups for clinical reasoning (American Indian or Alaskan Native Md=17.1, 95% CI [16.0, 18.0], Asian/Pacific Islander Md=17, 95% CI [15.0, 17.0], Black or African American Md=17, 95% CI [16.0, 18.0], Hispanic Md=15, 95% CI [12.0, 18.0], White or Caucasian Md=17, 95% CI [17.0, 17.0], prefer not to answer Md=17.5, 95% CI [11.0, 20.0], and multiple ethnicity Md=17.5, 95% CI [17.0, 18.0]), χ^2 (6, n=211)=7.55, p=.273,r=.04. Summative CPI scores also demonstrated no difference across ethnic groups, (American Indian or Alaskan Native Md=17, 95% CI [16.3, 17.9], Asian/Pacific Islander Md=17, 95% CI [16.0, 17.1], Black or African American Md=17, 95% CI [16.7, 18.2], Hispanic Md=15, 95% CI [13.0, 17.3], White or Caucasian Md=17.1, 95% CI [17.0, 17.4], prefer not to answer Md=17.5,

95% CI [12.7, 19.1], and multiple ethnicity Md=17.4, 95% CI [16.6, 18.0]), χ^2 (6, n=211) 8.74, p=.189, r=.04. (Figures 3 & 4 ; Table 2).
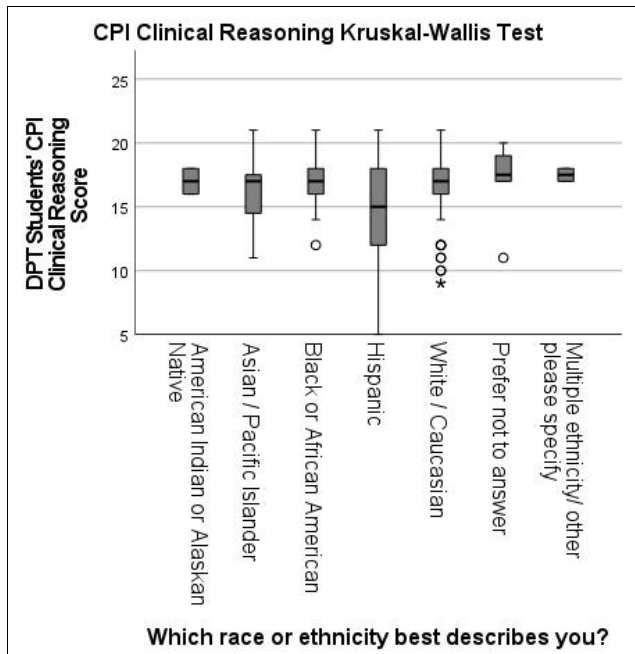

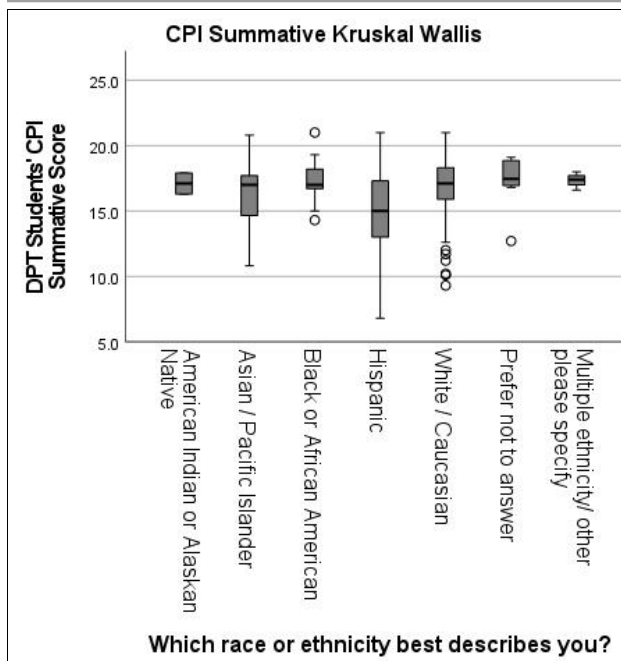**Figure 3.** CPI Clinical Reasoning Kruskal-Wallis results across all ethnic groups

Figure 4. CPI summative Kruskal-Wallis results across all ethnic groups

DISCUSSION

According to clinical instructors, all DPT student ethnic groups demonstrated ample clinical readiness and strong clinical performance during Fall 2020 clinical experience interventions. We found no difference across ethnic groups in clinical reasoning self-efficacy (PTSE) during clinical experiences. The distribution of PTSE scores was the same across the groups. This suggests that DPT students from all ethnic groups felt equally prepared for their clinical experiences, regardless of the level of the experience. There was no difference across ethnic groups in confidence treating at initial and subsequent visits. This suggests that among various ethnic groups, students were equally confident to treat patients at initial and subsequent visits, regardless of the level of clinical experience. Our findings conflict with a previous report which suggests variation across ethnic groups on clinical performance ratings by clinical instructors during clinical experiences.[2] Our results demonstrated no difference across ethnic groups in clinical performance based on final clinical reasoning and summative CPI rating scores. Our findings also contradict previous literature suggesting the potential of covert bias in the evaluation of physical therapy students' clinical performance based on ethnicity with those from underrepresented ethnic groups marked lower, as evidenced by our results that demonstrated no difference across ethnic groups in clinical performance on final CPI ratings for clinical reasoning and summative scores.[7] Our findings suggest that ethnicity does not impact DPT students' clinical readiness and performance.

We retain our null hypothesis, that there is no difference across ethnic groups in clinical reasoning readiness based on self-efficacy, confidence in treating patients, and clinical performance. In our university system, entry-level 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, identifying an opportunity to expand ethnic diversity representation in DPT programs.[2]

Limitations

There are several limitations of this study. The study was cross-sectional and did not intend to infer any causality from the educational process. Due to the study period during Fall 2020 of the COVID-19 pandemic, our survey had a disproportionately high number of orthopaedic primary care area and outpatient clinic practice settings responses, which may impact the study's overall generalizability. We also recognize the potential subjective bias of clinical instructors rating students and reliability limitations of the APTA CPI.[11] Lastly, our private university socioeconomic demographics may vary from public universities, potentially reducing generalizability.

Recommendations for Future Research

Future research should consider investigating clinical reasoning-self-efficacy, confidence treating, and clinical performance ratings of DPT students from public universities, and across a greater exposure to practice settings. Further assessment of the impact of ethnicity on clinical readiness and performance may be warranted, and factors affecting underrepresentation in entry-level physical therapy programs in the United States should be explored. Our findings support increasing ethnic group representation among entry-level physical therapy programs in the United States to better match societal representation and need.

Conflict of Interest Disclosure

"No potential conflict of interest relevant to this article was reported."

Funding N/A

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Appendices

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.					

Appendix 2. Ethnicity Does Not Impact Physical Therapy Students' Clinical Readiness and Performance, a United States Exploratory Study

Element	Item #	Recommendation	Page #
Title and Abstract	1	Indicate the study's design with a commonly used term in the title or abstract	Abstract
		Provide in the abstract an informative and balanced summary of what was done and what was found	Abstract
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	Page 3
Objectives	3	State specific objectives, including any prespecified hypotheses	Page 3
Methods			
Study Design	4	Present key elements of study design early in the paper	Pages 3-4
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	Page 4
Participants	6	**(a)** *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up	Page 4
		Case-control study—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls	Page 4
		Cross-sectional study—Give the eligibility criteria, and the sources and methods of selection of participants	Page 4

Element	Item #	Recommendation	Page #
		(*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed	Page 4
		Case-control study—For matched studies, give matching criteria and the number of controls per case	Page 4
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	Pages 4-5
Data sources/measurement	8	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	Pages 4-5
Bias	9	Describe any efforts to address potential sources of bias	N/A
Study size	10	Explain how the study size was arrived at	Page 4
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	Page 5
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	Pages 4-5
		(b) Describe any methods used to examine subgroups and interactions	Pages 4-5
		(c) Explain how missing data were addressed	N/A
		(d) *Cohort study*—If applicable, explain how loss to follow-up was addressed *Case-control study*—If applicable, explain how matching of cases and controls was addressed *Cross-sectional study*—If applicable, describe analytical methods taking account of sampling strategy	N/A
		(e) Describe any sensitivity analyses	N/A
Results			
Participants	13	(a) Report numbers of individuals at each stage of study—e.g., numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analyzed	Pages 4-5
		(b) Give reasons for non-participation at each stage	N/A
		(c) Consider use of a flow diagram	N/A
Descriptive data	14	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	Page 4
		(b) Indicate number of participants with missing data for each variable of interest	N/A
		(c) Cohort study—Summarize follow-up time (eg, average and total amount)	N/A
Outcome data	15	Cohort study—Report numbers of outcome events or summary measures over time	N/A
		Case-control study—Report numbers in each exposure category, or summary measures of exposure	N/A
		Cross-sectional study—Report numbers of outcome events or summary measures	Pages 5-6
Main Results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (e.g., 95% confidence interval). Make clear which confounders were adjusted for and why they were included	Pages 5-6
		(b) Report category boundaries when continuous variables were categorized	N/A
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	N/A
Other analyses	17	Report other analyses done—e.g., analyses of subgroups and interactions, and sensitivity analyses	Pages 4-5
Discussion			
Key results	18	Summarize key results with reference to study objectives	Page 6

Element	Item #	Recommendation	Page #
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	Pages 6-7
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	Pages 6-7
Generalizability	21	Discuss the generalizability (external validity) of the study results	Pages 6-7
Other Information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	N/A