

5-1-2023

Analyzing Equity Within the University of Nevada, Las Vegas Physical Therapy Program Admissions Process

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ANALYZING EQUITY WITHIN THE UNIVERSITY OF NEVADA, LAS VEGAS
PHYSICAL THERAPY PROGRAM ADMISSIONS PROCESS

By

Rebecca Altman
Savanna Cathey
Michelle De Dmon

A doctoral project submitted in partial fulfillment
of the requirements for the

Doctor of Physical Therapy

Department of Physical Therapy
School of Integrated Health Sciences
The Graduate College

University of Nevada, Las Vegas
May 2023

Doctoral Project Approval

The Graduate College
The University of Nevada, Las Vegas

May 12, 2023

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Analyzing Equity Within the University of Nevada, Las Vegas Physical Therapy Program
Admissions Process

Dissertation Title

is approved in partial fulfillment of the requirements for the degree of

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Abstract

Purpose

The purpose of this study was to analyze the admissions process of the University of Nevada Las Vegas Physical Therapy (UNLVPT) program through the lens of racial equity.

Methods

A retrospective cohort of UNLVPT applicants between 2014-2019 was obtained from the physical therapy centralized admissions system and the UNLVPT admissions office. Applicant and application characteristics were compared by racial group.

Results:

Our sample included 2937 total applicants with 212 (7.2%) that were admitted and matriculated into the program. Applicants identified as 49% White, 24% Asian, 13% multiracial, 6% Hispanic, 2% Black, 0.2% American Indian, and 6% did not report their race. Those admitted were 56% White, 22% Asian, 11% multiracial, 5% Hispanic, 1% Black, and 5% did not report their race. The proportion of applicants admitted from within each racial group were not statistically different from the number that applied from each group χ^2 6.05(6), $p=0.417$. The proportions of applicants who submitted a complete application, before the deadline, and met minimum criteria were different across racial groups χ^2 39.6(6), $p<0.001$; 21% White, 15% multiracial, 14% Asian, 10% Hispanic, 6% Black, and 12% among those not reporting their race. Black applicants had significantly lower overall GPA (mean=3.1, 95% CI=3.0-3.2), prerequisite GPA (2.5, 2.2-2.8), and GRE scores (33.5, 29.3-37.8) but significantly higher virtual (3.7, 1.0-6.4) and on-site (33.0, 26.2-39.9) interview scores compared to other applicants.

Discussion and Conclusion:

The proportion of applicants from minority racial/ethnic groups was not significantly different from the proportion of students admitted from those groups. Underrepresented minority groups more frequently submitted an incomplete application, after the deadline, without meeting minimum criteria. Despite having the highest interview scores, Black applicants had the lowest GPA and GRE scores. As GPA and GRE are reliable indicators of ability to complete DPT curriculum and pass the NPTE, applicants from minority racial/ethnic backgrounds, especially Black applicants, may need more support during undergraduate preparation to be successful applicants and DPT students. As the field of Physical Therapy continues to grow, DPT programs should continue to evaluate their assessment methods for incoming students, especially for students from minority backgrounds. There continues to be a need for research in diversity, equity, and inclusion within DPT program admissions to increase application success among underrepresented groups.

Keywords: Physical Therapy Admissions, Diversity, Racial/ethnic minority students,

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Introduction

The admissions processes and policies of universities have been under pressure to better consider the issues of diversity, equity, and inclusion. This attention is underscored by the observation that diversity of the student body does not often reflect the diversity of the community it serves. For example, “nationwide, Blacks make up 5.3 percent of all practicing physicians. The 2020 Census estimates that Blacks are 14.2 percent of the total population” (Comparing the Black Population, 2022). This is especially important for healthcare professional programs, such as Doctor of Physical Therapy (DPT) programs for a few key reasons. Structural racism, defined as “the totality of ways in which societies foster racial discrimination through mutually reinforcing systems of housing, education, employment, earnings, benefits, credit, media, health care, and criminal justice” contributes to poorer health outcomes for individuals with ethnic/racial minority backgrounds within the United States (Bailey et al., 2017). In order to address these poorer health outcomes, healthcare education should focus on dismantling systems in place that reinforce discriminatory beliefs, values, and distribution of resources (Bailey et al., 2017). It is well documented that healthcare providers from minority backgrounds are more likely to practice in underrepresented communities (Cooper-Patrick et al., 1999; Grumbach & Mendoza, 2008). There is a historic lack of students that identify as specific racial and ethnic minorities within health professional programs (Grumbach & Mendoza, 2008). Current literature suggests that physical therapy is one of the least racially diverse healthcare professions and poorly represents the population (Salsberg et al., 2021). As reported by the American Council of Academic Physical Therapy (ACAPT), in the 2014-15 admissions cycle, only 13.3% of accepted applicants were from underrepresented racial groups (ACAPT Board Report Diversity Task

Force, 2016). Unfortunately, that percentage does not reflect the population of the United States, of which 39.3% is from non-white racial groups (United States Census Bureau, 2021).

The ACAPT, a division of the American Physical Therapy Association (APTA) focusing on physical therapy (PT) education, defines “under-represented minorities”(URM) in physical therapy education as “the racial and ethnic populations that are underrepresented in physical therapy education relative to their numbers in the general population, as well as individuals from geographically underrepresented areas, lower economic strata, and educationally disadvantaged backgrounds” (ACAPT Board Report Diversity Task Force, 2016). While this definition broadly describes a large population of students who are underrepresented in healthcare education, the ACAPT specifies that individuals who identify as Hispanic/Latino, African American/Black, American Indian/Alaskan Native, and Hawaii/Pacific Islander are all underrepresented in physical therapy programs (ACAPT Board Report Diversity Task Force, 2016). According to the National Census Bureau in the United States, Hispanic/Latino Americans represent 18.5% of the population, African Americans/Black represent 13.4% of the population, Native Americans represent 1.3% of the population, and Hawaiian/Pacific Islanders represent 0.2% of the population. (United States Census Bureau, 2020). In contrast, the 2016 APTA member survey reports that 88.5% of members who are licensed physical therapists in the US identify as white alone, meaning minority physical therapists represent only 11.5% of APTA members (APTA, 2019). At the University of Nevada, Las Vegas (UNLV), 55.2% of undergraduate students, and 40.1% of all graduate students in the School of Integrated Health Sciences, in which the UNLV Physical Therapy (UNLVPT) program is located, are from underrepresented racial and ethnic minorities (Office of Decision Support, 2020). Within the UNLVPT program, the proportion of underrepresented minority students (matriculating students identifying as either Hispanic/Latino,

African-American/Black, American Indian/Alaskan Native, and Hawaii/Pacific Islander) is only 19% (PTCAS, 2020). As of 2020, over 84% of core faculty in PT programs across the country are white (Papa, 2021). Furthermore, the proportion of non-minority individuals entering the PT workforce is projected to become less diverse than current statistics suggest due to the decrease in the educational pipeline of minority students into programs (Salsberg et al., 2021). Clearly, the need to examine this disconnect is pertinent to the future of diversity within the physical therapy profession.

There are several factors that may affect minority physical therapy applicants more than those from non-minority groups. Undergraduate grade point average (uGPA), performance on the Graduate Record Examination (GRE), and in-person interviews are frequently used to determine if a student should be admitted to a physical therapy program (Taylor, 2012). In 2015, 91.7% of DPT programs in the United States required the GRE to be considered for admissions (Cahn, 2015). While some research supports the use of uGPA and the GRE for predicting graduate student success, other studies indicate these measures may not be predictive of academic success or National Physical Therapy Examination (NPTE) licensure pass rates (Taylor, 2012). In addition to historic discrimination and exclusion from academic institutions based on racial/ethnic identity, minority students tend to face more financial related barriers to success on these metrics compared to non-minority students (Naidoo et al., 2020). Some of the difficulties faced by minority students may be the need for employment during undergraduate education, inability to afford tutoring, and inability to retake the GRE multiple times (Perez, 2011; Bleske-Rechek & Browne, 2014; Naidoo et al., 2020). Additional concerns have been raised about institutions continuing to require the GRE in the wake of the COVID-19 pandemic (Hu, 2020). While the Educational Testing Service now offers the exam in a format that can be

taken at home without needing to find a testing service, underrepresented students, especially those from rural areas without stable internet or who may live with relatives or children, may still be disadvantaged (Hu, 2020). In regard to uGPA, hours worked at an off campus job and working for financial need have been shown to have a negative impact on a student's GPA during a given term (Logan, J., Hughes, T., & Logan, B. 2016; Wenz, M., Yu, W.-C, 2010). The influence of these factors on admission and their impact on minority students in particular continues to require consideration.

Once accepted to a program, student success is typically measured by graduation from the program and passing the NPTE. While these are not unreasonable metrics for measuring success, it has been established that being from a racial/ethnic group other than white/non-Hispanic is associated with greater academic difficulty in physical therapy education, which can influence minority student success (Utzman et al., 2007). This may be related to factors such as lack of financial support and social support during education and the lack of availability of minority faculty mentorship (Naidoo et al., 2020). There is currently a lack of research investigating whether minority students are more or less likely to pass the NPTE compared to non-minority peers and what pre-admission factors might contribute to their success.

The overall purpose of this study was to explore the racial equity of UNLVPT admissions processes and to determine factors associated with predictors of success (admission decision and NPTE scores) for minority students from the 2014-2021 application cycles to UNLVPT. The first aim of this study was to quantify the diversity of applicants by examining admissions data for each of the PTCAS racial/ethnic minority groups (White, Hispanic/Latino, African-American/Black, American Indian, Hawaii/Pacific Islander, and Multiracial). The second aim of the study was to identify pre-admission factors associated with successful matriculation into

UNLVPT and how those factors differ by racial identity. The UNLVPT program has the potential to influence the availability of physical therapy services in areas with significant health disparities by addressing problems that may be present in the admissions process for minority students.

Methods

Data Sources and Ethical Considerations

The UNLVPT admissions coordinator retrieved and deidentified application data from the Physical Therapy Centralized Application Service (PTCAS) for applicants in the 2014-2020 admission cycles. The specific variables obtained include aspects of the applicants prior, during, and after physical therapy school. Variables analyzed from the time prior to physical therapy school were: overall undergraduate GPA, prerequisite course GPA, GRE quantitative score, GRE qualitative score, GRE writing score, total observation hours completed, total extracurricular hours completed, total employment hours pre-application, timeframe student held employment position, certifications held, college(s) attended, college degree(s), degree primary major, degree secondary major, race, and gender. Variables analyzed from data collected during the admissions process were: age at submission, year applicant applied to program, admissions decision codes, such as denied or offer accepted, average admissions interview score, and virtual interview scores added in 2019 (Kira Talent, Toronto Canada 2012). Kira Talent brands itself as a holistic admissions assessment software for academic admission departments. Lastly, variables analyzed after physical therapy school matriculation were: final program GPA and NPTE scores. If applicants marked more than one race they were combined into a multi-racial group for analysis. Additionally, those who left the race question blank were placed in a group titled Did Not Report. The project proposal was submitted for IRB review and was determined to not be human subjects research.

Statistical Analysis

All statistical analyses were conducted using SPSS statistical package (SPSS® ver. 27.0, IBM Corp., NY, USA). The first aim was achieved by analyzing demographic data. For the

second aim of the study, a Pearson Correlational Analysis (two-tailed, $p < 0.05$) was used to assess the level of agreement between total application score and the following variables: age, sex, number of employment hours, number of dependents, undergraduate GPA, prerequisite GPA, Quantitative GRE score, and race/ethnicity (5 levels; White, Hispanic/Latino, African American/Black, American Indian/Alaskan Native, and Hawaii/Pacific Islander). To account for the number of separate tests being analyzed a Bonferroni Corrected post hoc test was performed. Initially we were utilizing a p value of 0.05 however due to the number of comparisons we used a Bonferroni adjusted p value of $p = .00065$. Several one-way ANOVA tests were performed (95% CI, $p < 0.05$). The independent variables were as follows: pre-admission score, pre-admission total GPA, pre-admission prerequisite GPA, average GRE score (Written, Verbal, and Quantitative), average interview score, NPTE score, and program GPA with the dependent variables being race/ethnicity as described previously. A chi-square analysis was performed to determine the association between race/ethnicity and admission decision.

Results

Aim 1: UNLV PT Applicant Demographics

Table 1 lists the descriptive statistics for all applications received by UNLVPT in our study. There was no data for American Indian applicants from Kira online interviews or in person interviews due to no applicants from that group in that part of the admissions process. We also did not have enough matriculated students from both American Indian and Black groups to analyze program GPA and NPTE score relative to the application process, matriculation, and graduation from the program.

Table 1. Descriptive statistics for all applicants by racial/ethnic group

	All applicants (n=2937)	American Indian (n = 5)	Asian (n = 707)	Hispanic (n = 169)	Black (n=67)	Multiracial (n = 369)	White (n=1443)	Did not report (n=177)
Age (mean, SD)	24.3, 3.1	27.6, 4.3	24.3, 2.9	24.5, 3.0	24.7, 4.2	24.2, 3.1	24.2, 3.3	24.8, 3.2
Sex (n, % female)	1316, 44.8	1, 20.0	300, 42.4	68, 40.2	37, 55.2	188, 51.0	641, 44.4	81, 45.8
Preadmission score (mean, SD)	16.2, 11.1	6.6, 5.3	15.5, 11.0	11.7, 9.6	7.5, 7.0	14.8, 10.6	18.0, 11.3	14.8, 10.3
Kira Score (mean, SD)	3.3, 0.7	--	3.2, 0.7	3.3, 0.7	3.7, 1.1	3.3, 0.8	3.3, 0.6	3.0, 0.2
Interview Score (mean, SD)	30.3, 5.3	--	29.3, 6.0	29.5, 8.7	33.0, 4.3	31.1, 5.1	30.7, 4.8	28.9, 4.5
Undergraduate GPA (mean, SD)	3.3, 0.4	3.0, 0.3	3.3, 0.4	3.3, 0.3	3.1, 0.4	3.3, 0.4	3.41, 0.3	3.3, 0.3
Prerequisite GPA (mean, SD)	3.0, 1.2	2.7, 1.6	2.9, 1.3	2.8, 1.3	2.5, 1.4	2.8, 1.3	3.2, 0.9	2.9, 1.3
GRE Written (mean, SD)	50.2, 26.6	38.4, 23.6	50.3, 28.2	40.7, 28.7	39.4, 24.4	49.7, 26.4	52.2, 25.2	48.3, 27.2
GRE Quantitative (mean, SD)	42.0, 23.0	28.0, 20.7	46.5, 25.2	30.6, 20.5	26.1, 16.7	38.9, 22.2	43.0, 21.4	39.5, 24.2
GRE Verbal (mean, SD)	46.2, 25.0	36.4, 24.5	44.3, 25.0	36.3, 24.4	35.2, 22.2	43.8, 23.8	49.4, 24.6	45.4", 28.1
Observation Hours (mean, SD)	1104.0, 1609.9	335.6, 316.6	1088.8, 1320.3	1556.2, 2044.7	1057.2, 1700.1	1331.9, 2167.1	976.6, 1438.5	1341.1, 1968.9
Extracurricular Hours (mean, SD)	1975.7, 7374.1	2785.4, 3074.5	1481.8, 5155.0	1215.5, 7766.2	3608.6, 16035.8	1797.9, 9225.6	2339.8, 7463.1	1436.7, 2826.4
Employment Hours (mean, SD)	3783.0, 7009.4	2278.9, 3276.3	2850.5, 4932.5	3800.0, 5564.7	3984.8, 9413.8	3610.2, 5879.6	4272.4, 8161.0	3827.2, 5951.8
Program GPA (mean, SD)	3.7, 0.2	--	3.7, 0.2	3.6, 0.1	--	3.7, 0.1	3.7, 0.2	3.7, 0.1
NPTE Score (mean, SD)	699.8, 49.6	--	685.6, 43.0	700.8, 57.8	--	672.7, 42.3	711.8, 51.1	673.8, 20.9

Table 2 highlights the descriptive statistics of only those students who were admitted into UNLVPT. In this group there are no American Indian students and only two Black students, both of whom had not finished the program at the time of data analysis. Black applicants scored

higher than any other group for the Kira online interview scores. Next, looking at in person interview scores Hispanic and Multiracial applicants scored higher than other groups. Two variables unique in *Table 2* are program GPA and NPTE score. For program GPA White graduates had a higher GPA than other groups. With NPTE scores, White graduates scored highest followed by Hispanic graduates.

Table 2. Descriptive Statistics Admitted Students

	All Admitted (n=212)	American Indian (n = 0)	Asian (n = 46)	Hispanic (n = 11)	Black (n =2)	Multiracial (n = 24)	White (n=119)	Did not report (n=10)
Age (mean, SD)	23.6, 3.3	--	22.7, 2.0	24.0, 4.2	24.0, 0.0	22.5, 1.6	24.1, 3.7	23.7, 3.2
Sex (n, % female)	92, 43.4	--	15, 32.6	5, 45.5	--	13, 54.2	53, 44.5	6, 60.0
Preadmission score (mean, SD)	31.4, 7.4	--	32.2, 8.2	26.5, 3.6	23.1, 11.5	30.1, 5.5	32.2, 7.5	29.2, 5.2
Kira Score (mean, SD)	3.6, 0.6	--	3.5, 0.7	3.4, 0.9	4.7, -	3.7, 0.6	3.6, 0.5	--
Interview Score (mean, SD)	32.6, 2.9	--	32.7, 2.5	34.6, 2.7	30.2, 0.1	33.6, 2.4	32.4, 3.1	31.2, 3.3
Undergraduate GPA (mean, SD)	3.7, 0.2	--	3.7, 0.2	3.6, 0.2	3.5, 0.3	3.7, 0.2	3.7, 0.2	3.5, 0.3
Prerequisite GPA (mean, SD)	3.7, 0.2	--	3.7, 0.2	3.6, 0.2	3.6, 0.2	3.6, 0.2	3.7, 0.2	3.7, 0.1
GRE Written (mean, SD)	65.9, 18.4	--	66.2, 20.8	70.5, 21.2	49.0, 9.9	67.1, 19.4	64.8, 16.9	72.6, 19.6
GRE Quantitative (mean, SD)	56.9, 16.4	--	61.2, 16.6	45.1, 10.5	33.5, 9.2	48.3, 16.9	58.7, 15.5	53.9, 17.4
GRE Verbal (mean, SD)	65.5, 18.6	--	65.1, 19.5	48.9, 23.8	64.0, 29.7	58.4, 19.7	68.3, 16.5	69.0, 17.4
Observation Hours (mean, SD)	781.3, 1103.9	--	661.9, 840.0	438.4, 588.5	1551.0, 2005.4	754.4, 1033.0	811.7, 1058.7	1256.3, 2484.9
Extracurricular Hours (mean, SD)	1570.8, 3538.3	--	511.2, 1480.2	717.2, 1523.6	1516.5, 857.7	912.2, 1003.7	2199.4, 4468.1	1494.1, 1599.5
Employment Hours (mean, SD)	4039.7, 6835.8	--	2675.1, 4873.4	1193.8, 1624.6	3701.3, 4398.1	2118.1, 2456.2	5106.4, 7967.6	5433.4, 8800.1

Program GPA (mean, SD)	3.7, 0.2	--	3.7, 0.2	3.6, 0.1	--	3.7, 0.2	3.7, 0.2	3.7, 0.1
NPTE Score (mean, SD)	699.8, 49.6	--	685.6, 43.0	700.8, 57.8	--	672.7, 42.3	711.5, 51.1	673.8, 20.9

The proportion of individuals from racial/ethnic identities of all applicants compared to those admitted is visualized in Figure 1. The proportion of applicants were as follows, 55% identified as male, 45% as female. Of admitted students, 56% identified as male, 44% as female.

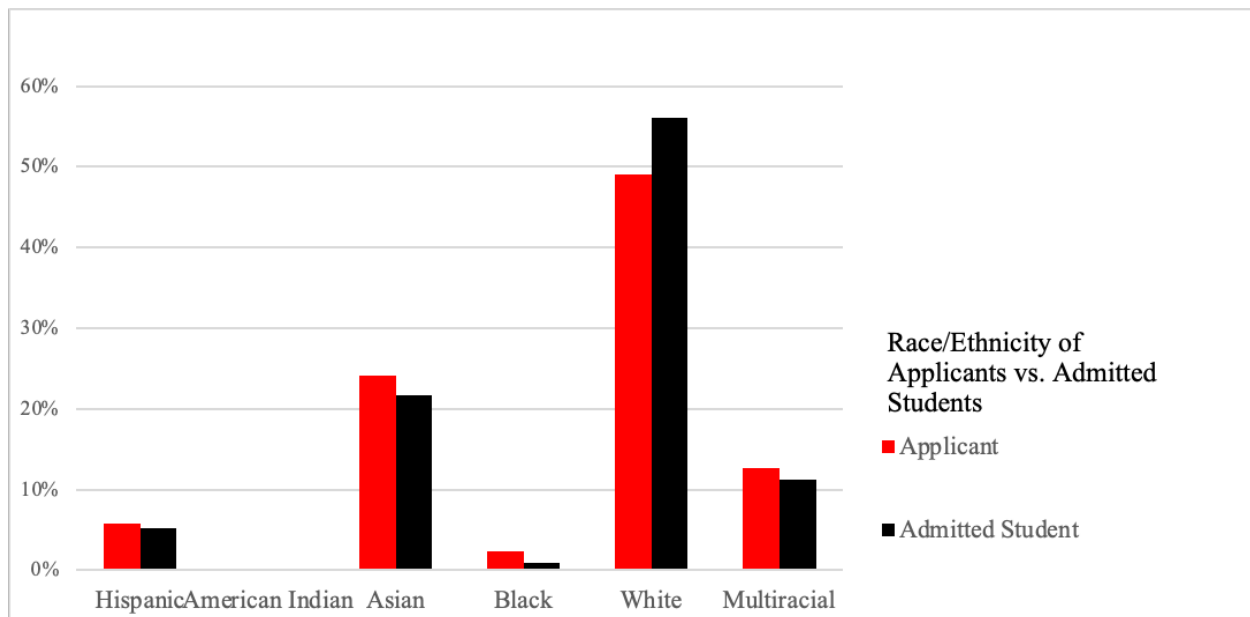


Figure 1. Comparison of race/ethnicity by percentage of applicants vs. admitted students.

Aim 2: Pre-admission Factors Correlated with Success and Analysis of Variance for Pre-Admission Factors, Admission Decision, and NPTE Scores

Correlational analysis revealed a significant but weak correlation between overall pre admission score and race ($r = .101, p < .05$) and no significant correlation between admission

decision and race ($r = .022, p = .117$). There were strong correlations between overall preadmission score and overall total GPA preadmission ($r = .762$) and GRE verbal and GRE quantitative ($r = .715$). When looking at NPTE scores and GRE there was a weak relationship between NPTE and GRE quantitative ($r = .250, p = .005$), but no significant correlation between the NPTE and GRE verbal and written scores.

There was a statistically significant difference in overall pre-admissions score among applicants from different racial/ethnic groups [$F(6, 2930)=21.39, p <.05$; Figure 2). In *post hoc* tests with Bonferroni corrected significance values, there were significantly higher scores for White, Hispanic, and Asian applicants compared to American Indian and Black applicants ($p <.05$).

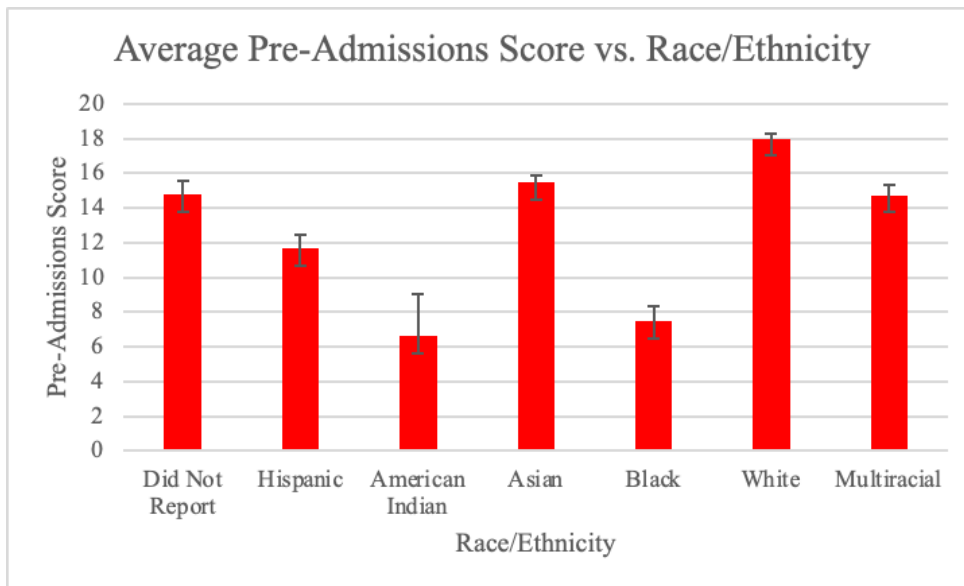


Figure 2. Average Pre-Admission Score vs. Race/Ethnicity.

There was a statistically significant difference in total pre-admission GPA between applicants from different racial groups [Total GPA $F(6, 2891)=26.71, p <.05$; Prerequisite GPA $F(6, 2919)=12.57, p <.05$; Figure 3]. In *post hoc* tests with Bonferroni corrected significance values, there were significant differences for total GPA between White applicants compared to Hispanic, Asian, Black, and multiracial applicants ($p <.05$). Likewise, for prerequisite GPA, significant differences in scores were observed between White and Hispanic, Asian, Black, and Multiracial applicants ($p <.05$).

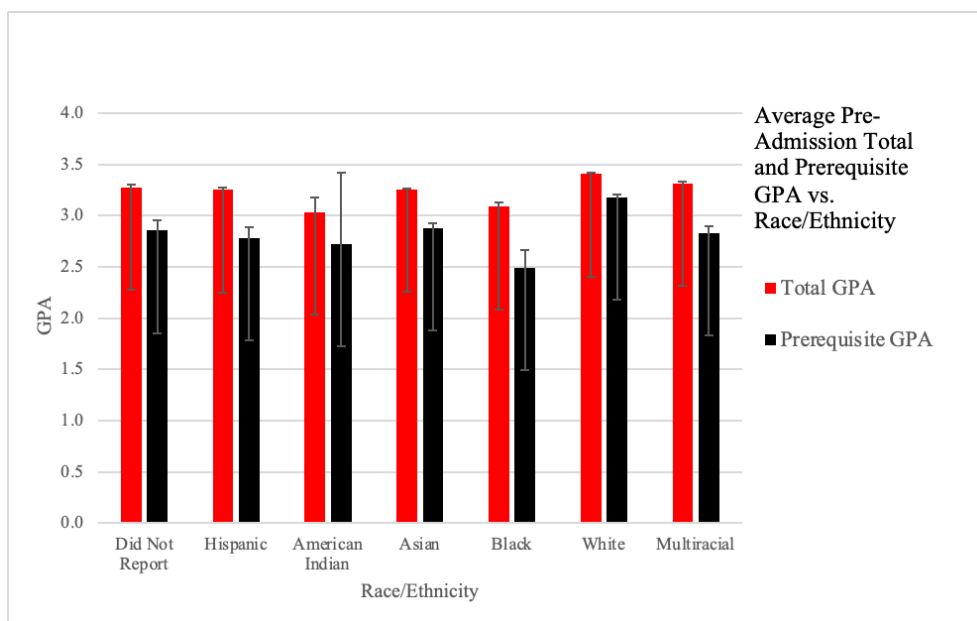


Figure 3. Average Pre-Admission Total GPA, and Pre-Admission Prerequisite GPA by Race/Ethnicity.

Shown in Figure 4, there were statistically significant differences in GRE Written, Quantitative, and Verbal scores between applicants based on race/ethnicity [GRE Written $F(6, 2930)=7.81, p <.05$; GRE Quantitative $F(6, 2930)=19.86, p <.05$; GRE Verbal $F(6, 2930)=12.24,$

$p < .05$]. In the *post hoc* tests with Bonferroni corrected significance values for the GRE Written Scores, there were significant differences between White and Hispanic applicants ($p < .05$) and also White and Black applicants ($p = .05$). For Quantitative scores, significant differences were present between White and Hispanic, Black and Multiracial applicants ($p < .05$) as well as White and Asian applicants ($p < .05$). For Verbal scores, significant differences were present for White and Hispanic, Asian, and Black applicants ($p < .05$), as well as White and Multiracial applicants ($p < .05$).

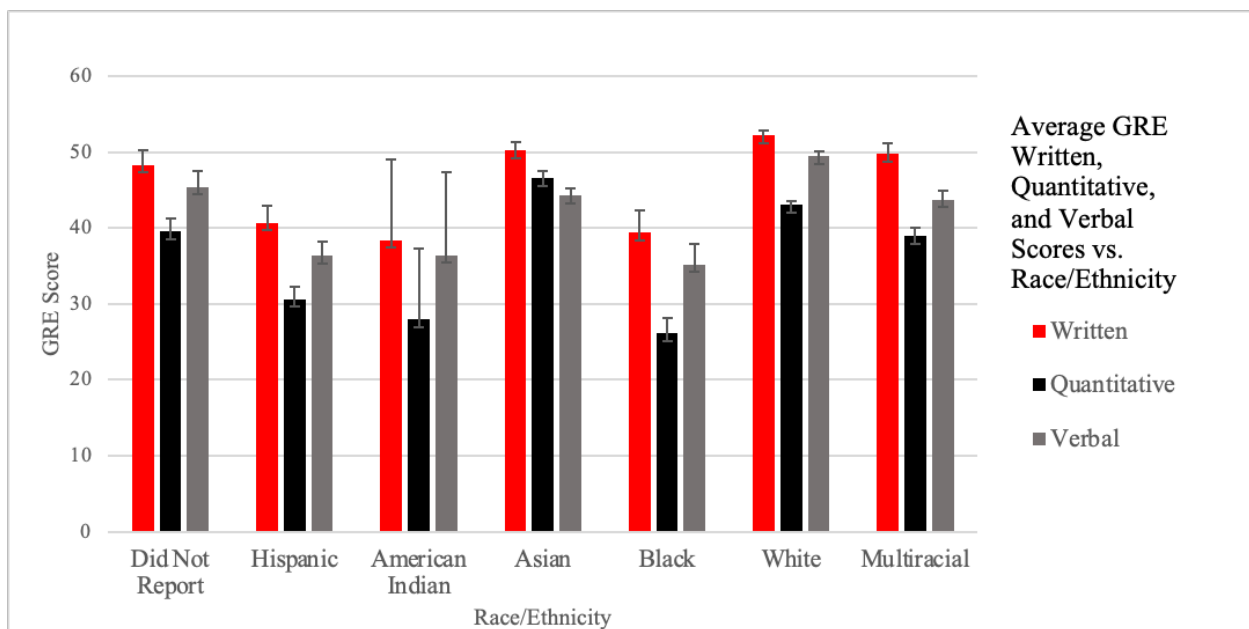


Figure 4. Average GRE Written, Quantitative, and Verbal Score vs. Race/Ethnicity.

The results in Figure 5 demonstrate the average scores by race/ethnicity for qualified applicants who attended UNLV PT's in-person interviews [$F(5, 513)=2.03, p = .07$]. While not

statistically significant, in-person interview scores trend towards significance with Black applicants receiving the highest scores on average.

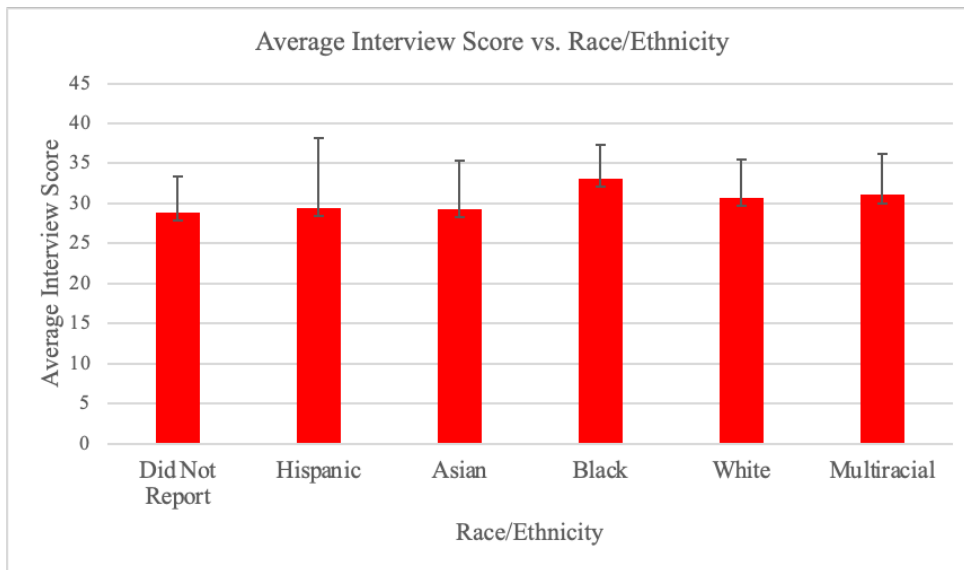


Figure 5. Average Interview score vs. Race/Ethnicity.

Shown in Figure 6, there was a statistically significant difference in NPTE score between students from different racial/ethnic groups [$F(4, 139)=3.76, p < .05$]. In the *post hoc* tests with Bonferroni corrected significance values for the NPTE Scores, there were significant differences between White and Multi-racial students ($p < .05$).

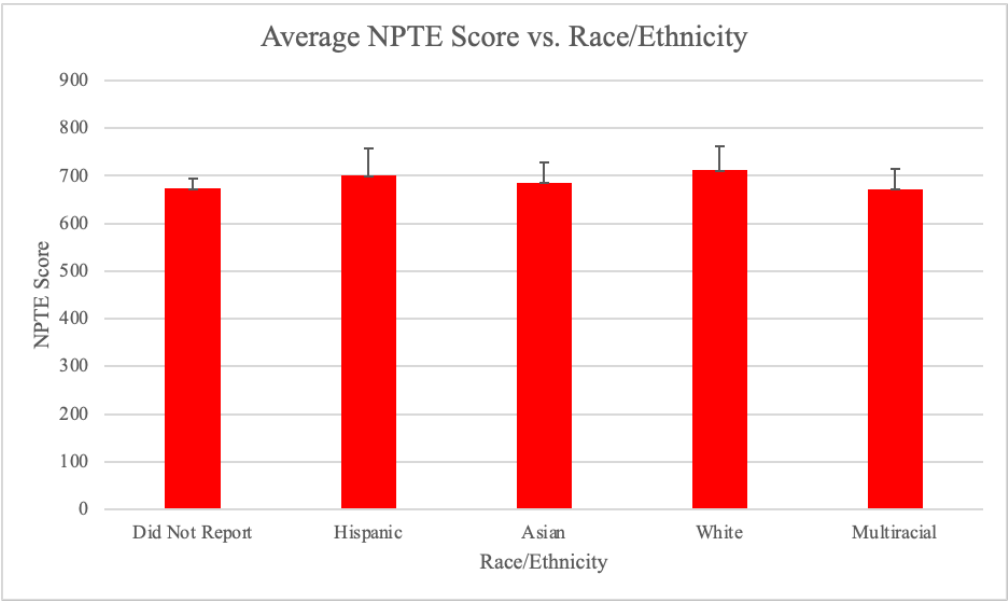


Figure 6. Average NPTE Score vs. Race/Ethnicity.

A statistically significant difference in program GPA among students from different racial/ethnic groups was not found [$F(4, 148)=1.70, p =.153$; Figure 7].

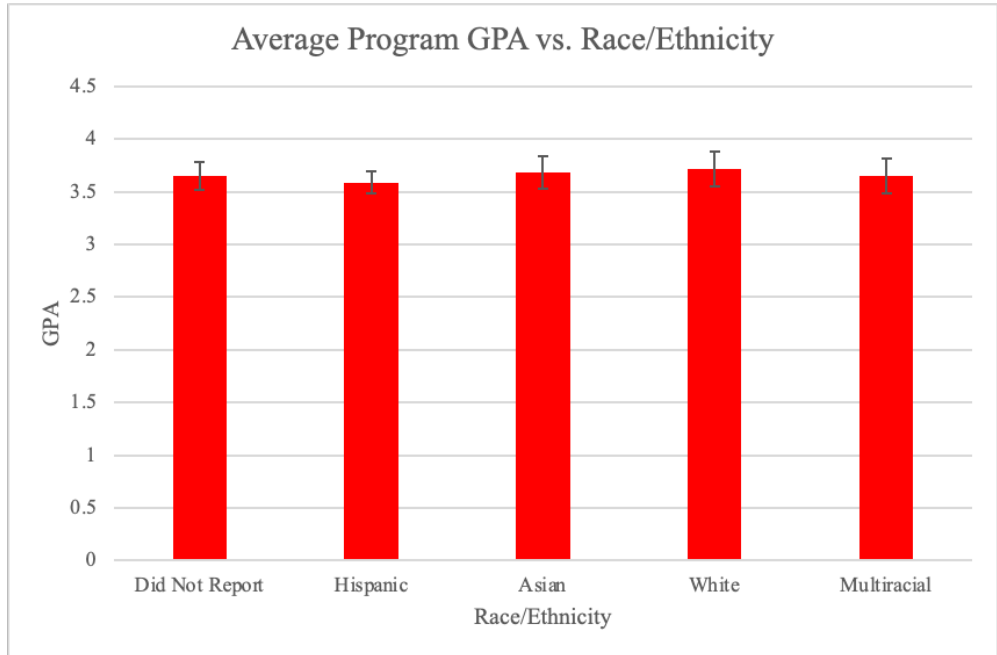


Figure 7. Program GPA vs. Race/Ethnicity.

Using a chi-square analysis we observed a statistically significant association between race and admissions decision. Applicants who identified as White were more likely to decline an admissions offer than those from other racial/ethnic groups ($p < .05$, adjusted residual 4.8). There was also a significant association between being denied admission due to an incomplete application and being American Indian ($p < .05$, adjusted residual 2.5). Additionally, there was a negative association between being White and being denied due to not being qualified ($p < .0001$, adjusted residual -5.7). Figure 8 displays the three main denial categories based on race.

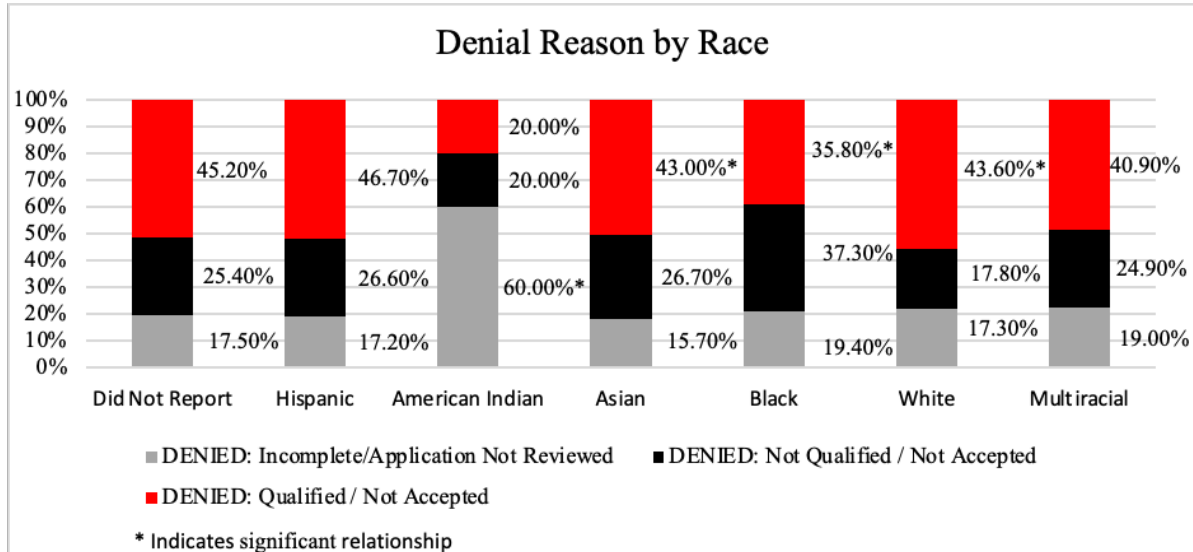


Figure 8. Percentage of admissions decision by race.

Discussion

The results of the current study are consistent with previous research analyzing admission statistics for Physical Therapy programs regarding diversity (Cahlo, 2022; Cahn, 2015; Grumbach, 2008; Kume 2019). The findings of the study demonstrate that there was an disproportionate number of minority students represented within the program compared to their United States population, weak correlation between overall pre-admission score and overall total GPA preadmission, significant differences amongst race/ethnicities, and several relationships between race and admission status.

The proportion of applicants and matriculated students from minority racial groups from our data was less than their proportion in the United States population. With data highlighting that underrepresented minority groups more frequently submitted an incomplete application, after the deadline, without meeting minimum criteria. Additionally, despite having the highest interview scores, Black applicants had the lowest GPA and GRE scores. These shortcomings may indicate that minority applicants will need more support during undergraduate preparation to be successful applicants if GPA and GRE are reliable indicators of ability to complete DPT curriculum and pass the NPTE. The validity of this conclusion, however, may be limited due to the small number of minority students applying to and matriculating into the UNLVPT program.

Overall pre-admissions score and overall total GPA preadmission had only a weak correlation with NPTE score. This may suggest that while the UNLVPT admissions process prioritizes GPA, it may not be as important for performance on the NPTE. Additionally, there is only a weak correlation between GRE quantitative scores and NPTE scores. For the other two portions of the GRE, written and verbal, there was no significant correlation with NPTE scores. Currently both the verbal and quantitative portions of the GRE are weighted equally in the

UNLVPT admissions process while the written portion is weighted lower. Previous studies have shown a relationship only between NPTE scores and GRE verbal and quantitative scores (Kume et al., 2019). However, it is recommended that no one physical therapist applicant variable be used as an independent predictor for success on the NPTE (Wolden et al., 2020). There continues to be mixed research findings on which variables are or are not valuable when predicting success. However, programs that analyzed variables, such as scores from decision-making and problem-solving measures, interpersonal skills, patient/client focus, communication, and teamwork constructs, saw increased diversity within the physical therapy program and better NPTE performance results (Woods, 2020). Therefore, a holistic approach to application review may be the key to improving diversity within the profession.

The results also indicated significant differences amongst race/ethnicities in average pre-admission scores, average pre-admission total GPA, and pre-admission prerequisite GPA, average GRE written, quantitative, verbal score, average NPTE score and average program GPA. Applicants and admitted students who identified as White scored the highest in all those factors except for GRE quantitative where those who identified as Asian scored the highest. Those who identified as American Indian and Black respectively scored the lowest in those categories except for the GRE verbal where American Indians scored the third lowest and those who identified as Black scored the lowest. Interestingly, Black applicants scored higher during in-person interviews compared to other racial/ethnic groups, however, these results were not significantly different from other racial/ethnic groups. These results highlight a lack of equity in traditional academic admissions factors. In-person interviews may be key in providing Black and other minority applicants the opportunity to succeed in the application process.

In regard to admission status, there were several key findings. First, the data showed that White applicants had the highest qualified, but not accepted admission status, whereas Black applicants had the lowest percentage of qualified, but not accepted admission status. Additionally, those applicants who identified as White were not denied admission as frequently due to lack of qualifications. Those relationships may highlight that “many students of color — particularly those from lower-income areas — have lower levels of academic preparation than their White peers upon entering college, which can affect degree attainment rates” (U.S. Department of Education, 2016). Lastly, American Indian applicants were denied due to incomplete applications more than other race/ethnicity applicants. However, there were only five applicants who identified as American Indian alone, which may limit the generalizability of this result.

There were several limitations that affect the generalizability of the current study including the inability to separate employment data, issues surrounding interpretation of GRE scores, lack of data concerning financial status of applicants, and lack of NPTE data for minority students. First, while analyzing the relationship between employment hours and admissions status there were multiple issues, the largest being that the PTCAS system does not separate employment that occurred during undergraduate education from all employment gained over an applicant’s career. One of the initial aims of the current study was to analyze the relationship between undergraduate employment and admission into UNLVPT. Employment data was also self-reported, which impacted our analysis if an applicant did not provide enough information about their employment. Regarding GRE, the current admissions process for UNLVPT does not assess individual GRE scores based on section or number of testing attempts. The process instead takes the highest score for each section. This could allow an advantage for applicants

who have the financial means to take the GRE multiple times, improving their score during each testing session. Additionally, the current study was not able to properly analyze socioeconomic status. While this was an area of focus during the initial development of the study, the financial questions on PTCAS are not required for applicants to report and these questions were only added in the 2019-2020 application cycle. Next, while qualified applicant data consisted of over 3,000 applicants, there were only 212 admitted students and only 144 with NPTE scores and program GPA. This limits our ability to look at race data as only 2 of the 212 admitted students were Black, 11 were Hispanic, and 24 identified as multiracial. Finally, all students who identified as more than one race were combined into a multiracial category. This was a limitation as it eliminated the ability to determine the effects of individuals who may have identified as more than one minority group. Another notable detail is that average NPTE score and average program GPA were not compared within the ANOVA for those who identified as American Indian and Black respectively due to a lack of students from these minority groups matriculating into the program.

Further research should investigate the specific reason(s) why differences were found in racial/ethnic backgrounds of students and admission trends. This may help further identify the gaps in the admission processes that may hinder students of color. The admissions process is not stagnant and continues to change over time, therefore identifying these changes and how they correlate with the pre, admitted, and denied applicants may be beneficial to help gaps in the admissions process. Academic “grit” may prove to be an important area for future Diversity, Equity, and Inclusion research. Grit is defined as “perseverance and passion towards longer-term goals and sustained commitment to completing an endeavor despite episodes of failure, setbacks, and adversity,” which can be analyzed through self-administered surveys (Calo et al., 2022). In

one study, a high level of academic grit in 3rd year DPT students was associated with better academic and clinical performance. Students with low academic grit scores demonstrated low coping skills and academic success (Calo et al., 2022).

As the field of Physical Therapy continues to grow, DPT programs should continue to evaluate their assessment methods for incoming students, especially for students from racial/ethnic minority backgrounds. While limitations exist in our research, the results of our study suggest race/ethnicity is an important factor in admission decisions. Findings of this study also demonstrate that the correlation of GPA and GRE score with NPTE score results are not as strong as other studies may indicate. There continues to be a need for research in Diversity, Equity, and Inclusion within DPT program admissions to ensure the demographics of future physical therapists is congruent with patient populations.

Declarations of interest: The authors declare no conflict of interest is present in this study

Funding Source: None

References

- American Council of Academic Physical Therapy Board Report Diversity Task Force.* (2016). <https://acapt.org/news/2016/04/28/diversity-report>
- Bailey, Z. D., Krieger, N., Agénor, M., Graves, J., Linos, N., & Bassett, M. T. (2017). Structural racism and health inequities in the USA: evidence and interventions. *Lancet (London, England)*, 389(10077), 1453–1463. [https://doi.org/10.1016/S0140-6736\(17\)30569-X](https://doi.org/10.1016/S0140-6736(17)30569-X)
- Beasley, T. M., & Schumacker, R. E. (2010). Multiple regression approach to analyzing contingency tables: Post hoc and planned comparison procedures. *Taylor & Francis Online*. Retrieved July 5, 2022, from <https://doi.org/10.1080/00220973.1995.9943797>
- Bleske-Rechek, A., & Browne, K. (2014). Trends in GRE scores and graduate enrollments by gender and ethnicity. *Intelligence*, 46(September-October 2014), 25–34.
- Cahn, P. (2015). Do health professions graduate programs increase diversity by not requiring the graduate record examination for admission? *Journal of Allied Health*, 44(1), 51–56.
- Calo, M., Judd, B., Chipchase, L., Blackstock, F., & Peiris, C. L. (2022). Grit, resilience, mindset, and academic success in physical therapist students: A cross-sectional, Multicenter Study. *Physical Therapy*, 102(6). <https://doi.org/10.1093/ptj/pzac038>
- Comparing the Black Population to the Number of Black Doctors by State. (2022). *The Journal of Blacks in Higher Education*, The Journal of blacks in higher education, 2022.
- Cooper-Patrick, L., Gallo, J. J., Gonzales, J. J., Vu, H. T., Powe, N. R., Nelson, C., & Ford, D. E. (1999). Race, Gender, and Partnership in the Patient-Physician Relationship. *JAMA*, 282(6), 583–589. <https://doi.org/10.1001/jama.282.6.583>
- Grumbach, K., & Mendoza, R. (2008). Disparities in human resources: Addressing the lack of diversity in the health professions. *Health Affairs*, 27(2), 413–422. <https://doi.org/DOI 10.1377/hlthaff.27.2.413>
- Hu, J. C. (2020). Online GRE test heightens equity concerns. *Science*, 368(6498), 1414. <https://doi.org/10.1126/science.368.6498.1414>
- Kume, J., Reddin, V., & Horbacewicz, J. (2019). Predictors of physical therapy academic and NPTE licensure performance. *Health Professions Education*, 5(3), 185–193. <https://doi.org/10.1016/j.hpe.2018.06.004>
- List of PTCAS Programs - University of Nevada, Las Vegas.* (2020). PTCAS. <https://ptcasdirectory.apta.org/535/University-of-Nevada-Las-Vegas>
- Logan, J., Hughes, T., & Logan, B. (2016). Overworked? An Observation of the Relationship Between Student Employment and Academic Performance. *Journal of College Student Retention: Research, Theory & Practice*, 18(3), 250–262. <https://doi.org/10.1177/1521025115622777>
- Naidoo, K., Yuhaniak, H., & Abel, Y. (2020). An ecological systems approach to exploring facilitators and barriers to success for minority students enrolled in a doctor of physical therapy program. *Health Professions Education*, 6(3), 394–405.
- Office of Decision Support. (2020). *Headcount Enrollment by College of Major, Race/Ethnicity and Gender.* University of Nevada, Las Vegas. <https://ir.unlv.edu/IAP/reports/diversity/headcount-by-college-race-and-gender/>

- Papa, E. (2022). *Diversity, Equity, and Inclusion in PT Research: Where Are We Now? Where Do We Grow?* APTA Combined Sections Meeting, San Antonio, TX.
- Perez, K. (2011). *GRE as a Predictor of Graduate Student Success at a Hispanic Serving Institution of Higher Education*. Florida International University.
- Physical Therapist Member Demographic Profile 2016-2017*. (2019). American Physical Therapy Association.
- Population by Race in United States* (American Community Survey ACSDP1Y2019.DP05). (2020). United States Census Bureau.
<https://data.census.gov/cedsci/profilechartwidget?geoID=0100000US&metricFormat=percent&topic=Race&type=bar>
- PTCASApplicantDataRpt.pdf*. (n.d.). Retrieved November 18, 2020, from
http://www.ptcas.org/uploadedFiles/PTCASorg/About_PTCAS/PTCASApplicantDataRpt.pdf
- Salsberg, E., Richwine, C., Westergaard, S., Portela Martinez, M., Oyeyemi, T., Vichare, A., & Chen, C. P. (2021). Estimation and Comparison of Current and Future Racial/Ethnic Representation in the US Health Care Workforce. *JAMA Network Open*, 4(3), e213789.
<https://doi.org/10.1001/jamanetworkopen.2021.3789>
- Taylor, K. (2012). *Redictors of success to pass the National Physical Therapy Exam: Is there a correlation between Gre/Gpa scores and success rates?* (thesis). Retrieved February 2023, from <https://dc.etsu.edu/honors/27/>.
- U.S. Census Bureau quickfacts: United States*. United States Census Bureau. (2021). Retrieved April 27, 2022, from
<https://www.census.gov/quickfacts/fact/table/US/PST045221>
- U.S. Department of Education, Office of Planning, Evaluation and Policy Development and Office of the Under Secretary. (2016). *Advancing diversity and inclusion in Higher Education*. Advancing Diversity and Inclusion in Higher Education. Retrieved February 27, 2023, from <https://www2.ed.gov/rschstat/research/pubs/advancing-diversity-inclusion.pdf>
- Utzman, R., Riddle, D., & Jewell, D. (2007). Use of demographic and quantitative admissions data to predict academic difficulty among professional physical therapist students. *Physical Therapy*, 87(9), 1164–1180.
- Wenz, M., & Yu, W.-C. (2010). Term-Time Employment and the Academic Performance of Undergraduates. *Journal of Education Finance*, 35(4), 358–373.
<http://www.jstor.org/stable/40704398>
- Wolden, M., Hill, B., & Voorhees, S. (2020). Predicting Success for Student Physical Therapists on the National Physical Therapy Examination: Systematic Review and Meta-Analysis. *Physical Therapy*, 100(1), 73-89.
- Woods, L. (2020). *An Examination of Diversity and Inclusion in Physical Therapy Admissions* [Doctoral Dissertation, Auburn University]. Auburn University Electronic Theses and Dissertations. <https://etd.auburn.edu/handle/10415/7145>.

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