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## Rural Or Underserved Practice Interest Among Doctor Of Physical Therapy Students. Do Clinical Education Experiences Change Opinions?

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RURAL OR UNDERSERVED PRACTICE INTEREST AMONG DOCTOR OF PHYSICAL THERAPY STUDENTS:

DO CLINICAL EXPERIENCES CHANGE OPINIONS?

By

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A doctoral project submitted in partial fulfillment

of the requirements for the

Doctor of Physical Therapy

Department of Physical Therapy

School of Allied Health Sciences

Division of Health Sciences

The Graduate College

University of Nevada, Las Vegas

May 2019

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## Doctoral Project Approval

The Graduate College  
The University of Nevada, Las Vegas

May 17, 2019

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Rural or Underserved Practice Interest Among Doctor of Physical Therapy Students: Do Clinical Education Experiences Change Opinions?

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## **Abstract**

**Background and Purpose:** People living in rural and underserved areas are poorly served by our country's healthcare system. The Federal Office of Rural Health Policy reports that approximately 18% of people in the United States live in rural areas. Within the physician and nursing literature the largest reported predictor of rural practice is having a rural background. Mandated rural medical rotations during training have been shown to positively alter interest in rural practice and employment. While nursing and medical students have been thus studied, limited evidence exists for physical therapists. The objective of this study was to determine how rural or underserved full time clinical education experiences completed by physical therapy students affect their interest in rural or underserved employment.

**Subjects:** Students (64) were recruited from a single physical therapy program of which 51 responded. Among them, 14 participated in full-time rural clinical education experiences, 32 in underserved, and 5 in settings considered both rural and underserved.

**Methods:** Pre- and post-full-time clinical education experience surveys, modified from the SOMERS Index of Rural Career Choice Likelihood, were administered online to the students within one week before and one week after their first rural or underserved clinical education experience. Surveys included questions on demographics, interest in practicing in rural, underserved, and urban locations following graduation, perceived barriers and benefits of practicing in these locations, and overall perception of the clinical education experience in which they participated.

**Results:** Students who participated in rural or underserved full-time clinical education experiences had a statistically significant increase in interest for seeking rural employment (0-7 scale with higher scores indicating greater interest; rural pre-interest =  $3.96 \pm 1.60$ , rural post-interest =  $4.41 \pm 1.81$ ,  $p = 0.012$ ), and a positive trend was observed in seeking underserved employment (underserved pre-interest = 4.88

$\pm 1.26$ , post-interest =  $5.16 \pm 1.39$ ,  $p = 0.07$ ). Students with intent to complete a rural or underserved clinical education experience regardless of curriculum requirements reported significantly higher satisfaction ( $6.46 \pm 0.64$ ) compared to those without such intent ( $5.35 \pm 2.17$ ,  $p = 0.012$ ). Upbringing in rural or underserved areas was not associated with interest in employment in these settings (Rural  $r_s = 0.26$ ,  $p = 0.07$ ; Underserved  $r_s = 0.11$ ,  $p = 0.44$ ). Interest in rural and underserved employment post-graduation was significantly associated with previous experience in that setting (Rural  $r_s = 0.36$ ,  $p = 0.009$ ; Underserved  $r_s = 0.38$ ,  $p = 0.006$ ).

**Discussion:** Student interest in seeking rural or underserved employment was higher among students who participated in rural or underserved full time clinical education experiences. Student intention to participate in rural or underserved full time clinical education experiences and previous experience in a rural setting appear to be linked to higher student satisfaction with their clinical education experiences and future intention to work in rural settings respectively. This study illustrates the importance of clinical education experience satisfaction in the recruitment of physical therapists in rural and underserved practice. Data gathered from our study may help educational administrators, employers and healthcare organizations to make informed decisions regarding curricular design changes, recruitment, and retention of physical therapists to improve the availability of health services in rural and underserved areas in the state of Nevada.

## **Acknowledgments**

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## Introduction

The Federal Office of Rural Health Policy (FORHP) reports that approximately 18% of the US population (57 million people) reside in rural areas.<sup>1</sup> In the state of Nevada, 9.7% (281,019 residents) of the population live in rural areas, which is expected to increase to 10.1% over the next decade.<sup>2</sup> The rural population of Nevada is spread over 95,431 square miles, roughly 87% of the state's area, with an average distance between acute care hospitals and tertiary hospitals of 118.1 miles.<sup>2</sup> Rural populations represent one of the largest underserved sectors in the United States healthcare system. In rural Nevada there are 36.1 primary care physicians per 100,000 people compared to 74.5 primary care physicians per 100,000 people in urban Nevada.<sup>2</sup>

Definitions for rural, underserved, and urban areas vary based on different governmental agencies. The Office of Management and Budget, an agency of the federal government within the Executive Office, defines rural as an area that is not a part of a Metropolitan Statistical Area, which is an area with more than 50,000 people, or a "micro" which contains 10,000 - 50,000 people.<sup>1</sup> The Health Resources and Services Administration (HRSA), an agency of the U.S. Department of Health and Human Services, defines medically underserved areas and populations (MUA/Ps) as specific sub-groups of people living in a defined geographic area with a shortage of primary care health services. These groups may face economic, cultural, or linguistic barriers to health care and may include, but are not limited to, those who are: homeless, low-income, Medicaid-eligible, Native American, or migrant workers.<sup>3</sup> The U.S. Census Bureau defines urban areas as 50,000 people or more and urban clusters as populations between 2,500 and 50,000 and assert that what is not urban is thus rural.<sup>1</sup> While broad definitions allow for better generalization to the public, not having clear and concise definitions may lead to ambiguous interpretations of certain populations. This lack of standardization in definitions may also pose issues for

educational programs and different agencies who wish to assess the effects of demographics on employment rates and healthcare availability in certain areas.

In the Eighth Edition of Nevada's Rural and Frontier Health Data Book, it was reported that of the 1,074 physical therapists in Nevada, only 82 practiced in rural counties.<sup>3</sup> Nationally there are 65.2 Physical Therapists per 100,000 people, while Nevada is ranked 45th out of 50 states with only 43.6 Physical Therapists per 100,000 people statewide.<sup>4</sup> A recent estimate by the Bureau of Labor and Statistics found that the nonmetropolitan areas of Northern and Southern Nevada employed 30 and 50 physical therapists in each area respectively per 100,000 people. In contrast, nonmetropolitan areas of other states (e.g. West Texas - 250, Eastern Oregon - 110, Northwest Iowa - 120, Panhandle of Idaho - 120) demonstrate much higher employment of physical therapists per 100,00 people.<sup>5</sup>

Rural populations in the United States tend to be older and sicker when compared to urban populations.<sup>6</sup> Urban populations have also experienced a more rapid decline in mortality rates when compared to rural populations.<sup>7</sup> These trends may contribute to a shortage of healthcare providers, as well as an increasing demand for physical therapy services. Although an increase in graduates from Physical Therapy programs may help address this current workforce shortage, The American Physical Therapy Association states that the need for physical therapy services will only increase in the coming years with projected employment growth of 36% by 2024.<sup>8,9</sup> At the projected growth rate, physical therapy employment may outpace the average for all occupations.<sup>9</sup> In 2013, nearly 1/4 of rural Nevadans reported activity limitations due to health issues and 11.1% reported using assistive devices.<sup>10</sup> Like many regions of the country, Nevada struggles to recruit and retain health care professionals to its rural regions who are affected by the large distances separating these communities from specialty care centers.<sup>11</sup>

Rural physician and health care provider shortage research has been an ongoing process for many healthcare professional schools and state departments.<sup>12,13</sup> Both nursing and medical students have been studied for predictors and indicators of rural practice, however limited evidence for the field of physical therapy is available. Among nurses and physicians, research has shown that the strongest predictor of rural practice is having a rural background.<sup>12,14</sup> Other predictors such as rural schooling, having a partner from a rural area, or having rural undergraduate or postgraduate training have also been shown to predict rural practice among non-physical therapy medical professionals.<sup>15</sup> Furthermore, medical students from a rural background who complete family medicine training are 2.5 times more likely to engage in rural practice than their peers from urban areas.<sup>16</sup> Mandated rural rotations during training positively alter interest in rural practice and intention for rural employment by medical students.<sup>17</sup> Nursing students who were surveyed before and after rural full-time clinical education experiences also demonstrated an increased interest in rural health.<sup>18</sup> Even those students with no prior experience working or living in a rural area have an increased intention to work in a rural community following rural clinical training.<sup>19</sup>

In a recent study, 40 students from 5 doctor of physical therapy programs were surveyed, and reported high levels of satisfaction after participating in their rural clinical education experiences.<sup>20</sup> Among these same students, positive changes in interest were more frequent than negative changes in interest after their rural clinical education experiences.<sup>20</sup> The authors also reported that the number of years a person had lived in a rural area was closely associated with their interest in working in rural settings.<sup>20</sup> In a study conducted in 2000 at the University of Nevada, Las Vegas, 1 cohort of physical therapy students were surveyed after participating in a 1 weekend rural health conference and a 5 week rural full-time clinical education experience.<sup>21</sup> Results from this study revealed increased interest in rural employment following completion of the rural clinical education experiences.<sup>21</sup> The authors

suggested that completing a clinical education experience in a rural setting might be even more effective than a 2-day, classroom-based, rural health conference in terms of influencing student intention to pursue rural practice; however, the study was limited by a small sample size, use of a non-validated survey that did not account for student rural background, and unclear definitions for rural, underserved, and urban areas.<sup>21</sup>

The increasing demand for physical therapy services and rural provider shortages emphasize the need to understand the factors which may influence physical therapy employment in rural and underserved areas. The main objective of this study was to assess student interest in rural or underserved practice before and after completing either a rural or underserved full time clinical education experience. In addition, we sought to identify and describe the benefits and barriers students' perceive to working in rural, underserved and urban settings, and lastly to identify student perceptions and demographic factors that are associated with interest in rural employment post-graduation.

## **Methods**

### *Subjects:*

Students from three different cohorts in a single physical therapy program between June 2017 and December 2018 were recruited. The program requires students to complete at least one of their 4 full-time clinical education experience in a rural or underserved setting prior to graduation. The full-time clinical educational experiences are 6 weeks (DPT 761), 11 weeks (DPT 762), 10.5 weeks (DPT 763), and 12 weeks (DPT 764) in duration.

### *Study design:*

Online surveys were administered to the students within 1 week before and after their first full-time rural or underserved clinical education experience. Surveys were a modified version of the SOMERS

Index of Rural Career Choice Likelihood as used in previous studies examining the effects of rural clinical experiences on physical therapy students (A.T. Still University, Glendale, AZ).<sup>20,22</sup> The SOMERS Index uses 10-point Likert Scales and self-reported percentages to measure rural intention, optional rural training, medical sub-specialization, ease (or self-efficacy) and rural status.<sup>22</sup> The validity of the SOMERS index has been previously reported (eigenvalue: 2.78, Cronbach's alpha: 0.78); however, the original SOMERS index does not take into consideration factors we wanted to measure in our study that included perceived barriers, perceived benefits, previous experience in rural or underserved clinics, interest in rural, underserved, and urban practice following graduation, overall perception of the clinical education experience, and student demographics, which we added in our modified survey (Tables 1, 3, 4 and 5).<sup>22</sup> Our new questions included both qualitative (short-answer) and quantitative (Likert Scale) questions (Supplemental Information 1, 2).

Designation of rural, underserved, or urban clinical education experiences were made using the University of Nevada, Las Vegas Physical Therapy (UNLVPT) program definitions, which combine elements from the U.S. Census Bureau, the Office of Management and Budget, and HRSA. At UNLVPT, a rural area is defined as a population consisting of any city, town and territory, incorporated or unincorporated, that the most current US Census approximates to be less than 50,000 persons and is located greater than 50 miles from the nearest Level II trauma center. Underserved locations are medically underserved areas or populations that have a shortage of primary health care services for residents within a geographic area, as designated by HRSA.<sup>1</sup> Urban and/or city locations are any population consisting of any city, town and territory, incorporated or unincorporated, that the most current US Census approximates to be more than 50,000 persons.

*Aim 1:* Determine if student interest for rural or underserved practice following graduation changes after a rural or underserved clinical education experience.

*Hypothesis:* If physical therapy students participate in a rural or underserved clinical placement, then they will demonstrate an increased interest in rural or underserved employment.

*Aim 2:* Determine factors associated with student's interest in rural or underserved employment post-graduation.

*Hypothesis:* If physical therapy students spent the majority of their K-12 years in a rural setting, then they will be more likely to have an interest in seeking rural setting employment.

*Aim 3:* Determine if student clinical satisfaction is associated with the perceived value of rural or underserved clinical experience.

*Hypothesis:* If physical therapy students participate in a rural or underserved clinical placement, then they will demonstrate an increased perception of the educational value of rural experience.

*Statistical Analysis:*

Comparisons of pre-clinical to post-clinical survey data were performed using t-tests for continuous data that met parametric assumptions. Correlations between dependent variables were determined by calculating a Spearman's coefficient. Chi Square analysis was used to test the association between the number of subjects in pre-clinical groups (e.g. rural experience or not) to post-clinical groups (e.g. rural job interest level). A p-value of  $\leq 0.05$  was considered significant for all tests.

**Results**

A total of 64 students were invited to participate in this study. Of these 64 individuals, 51 (mean age: 25.9 years), completed both the pre- and post-surveys, a response rate of 79.7%. Fourteen of the



students participated in rural full-time clinical education experiences, 32 in underserved, and five in a setting that qualified as both rural and underserved (Table 1).

**Table 1. Demographics of students who completed both pre- and post-surveys.**

	No. of students N (%)
<b>Background/Demographic</b>	
Total	51 (100)
Gender	
Male	28 (54.9)
Female	23 (45.1)
Ethnicity	
African-American/Black	---
American Indian/Alaskan Native	---
Asian	11 (21.6)
Caucasian/White	40 (78.4)
Native Hawaiian/Pacific Islander	3 (5.9)
<b>Clinical Experience</b>	
Number of weeks	
6	28 (54.9)
10.5	8 (15.7)
11	10 (19.6)
12	5 (9.8)
Type of Affiliation	
Rural	14 (27.5)
Underserved	32 (62.7)
Rural/Underserved	5 (9.8)
<b>Previous Experience with Rural/Underserved</b>	
Volunteered or Worked	
Yes	29 (56.9)
No	22 (43.1)
<b>Chosen Rural/Underserved (Regardless of Requirements)</b>	
Desire	
Yes	28 (54.9)
No	23 (45.1)

When asked to rate the educational value of their clinical experiences on a 7-point Likert scale (7 = Strongly Agree, 4 = Neutral, 1 = Strongly Disagree), 90.2% of students agreed or somewhat agreed that they were satisfied with their rural/underserved clinical education experiences ( $5.96 \pm 1.61$ ). In addition,

90.2% of the students also reported gaining a greater understanding of rural/underserved practice (5.92 ± 1.31) and 92.2% had more confidence in their clinical abilities (5.96 ± 1.43). See Table 2.

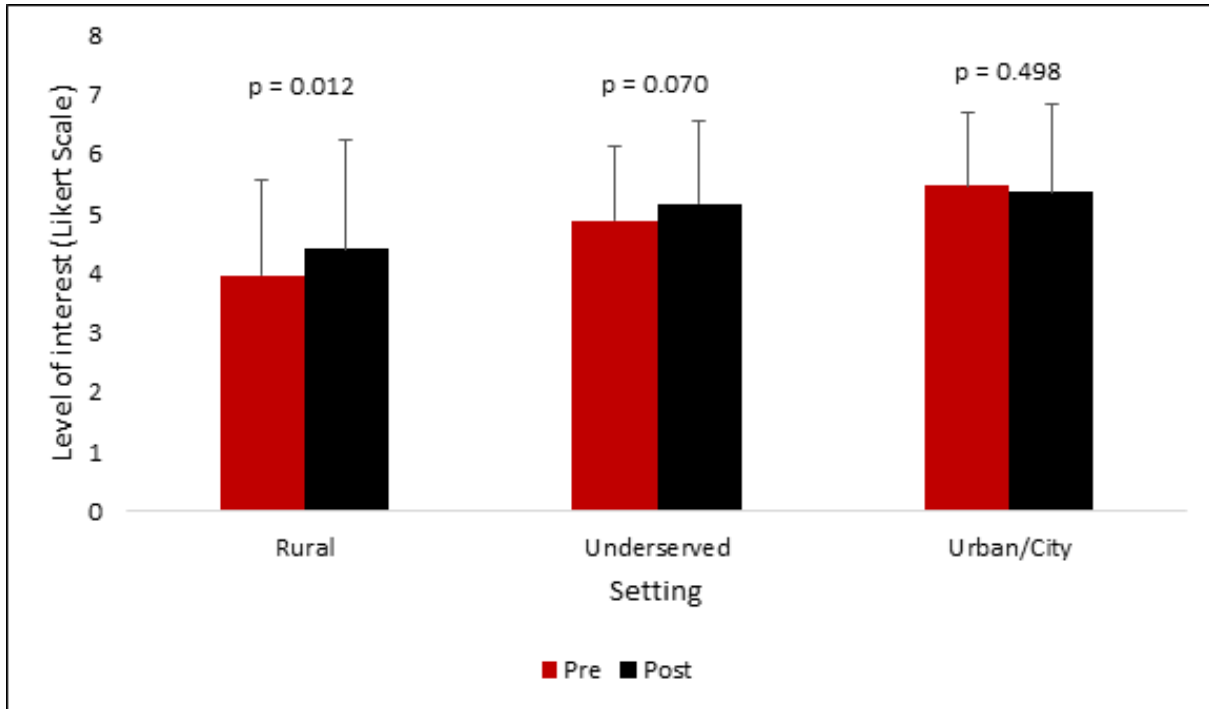
**Table 2. Levels of agreement with post-clinical statements regarding overall experience.**

7 = Strongly Agree, 6 = Agree, 5 = Somewhat Agree, 4 = Neutral, 3 = Somewhat Disagree, 2 = Disagree, 1 = Strongly Disagree.

Statement	Frequency of Responses (N = 51)			Mean (SD)
	Somewhat Disagree or Lower	Neutral	Somewhat Agree or Higher	
This experience has helped develop my confidence in clinical abilities	3	1	47	5.96 (1.43)
I believe I gained a greater understanding of what it would be like to practice in a rural/underserved setting	2	3	46	5.92 (1.31)
I was satisfied with my rural/underserved clinical experience	4	1	46	5.96 (1.61)
I believe location plays a huge role in the job setting I choose	2	1	48	5.92 (1.25)
Salary and benefits play a huge role in the job setting I choose	4	4	43	5.63 (1.46)

To determine whether student interest in future rural, underserved, and urban/city practice changed after participating in their full-time clinical education experiences, paired t-tests were conducted to compare the students' interest prior to starting their clinical education experiences and after its completion (Figure 1). Of the three settings that were assessed, rural employment was the only setting for which students reported a statistically significant increase in interest comparing pre- to post-clinical education experience (pre-interest = 3.96 ± 1.60; post-interest = 4.41 ± 1.81, p = 0.012). Although a positive trend in interest towards seeking underserved employment was also seen (pre-interest = 4.88

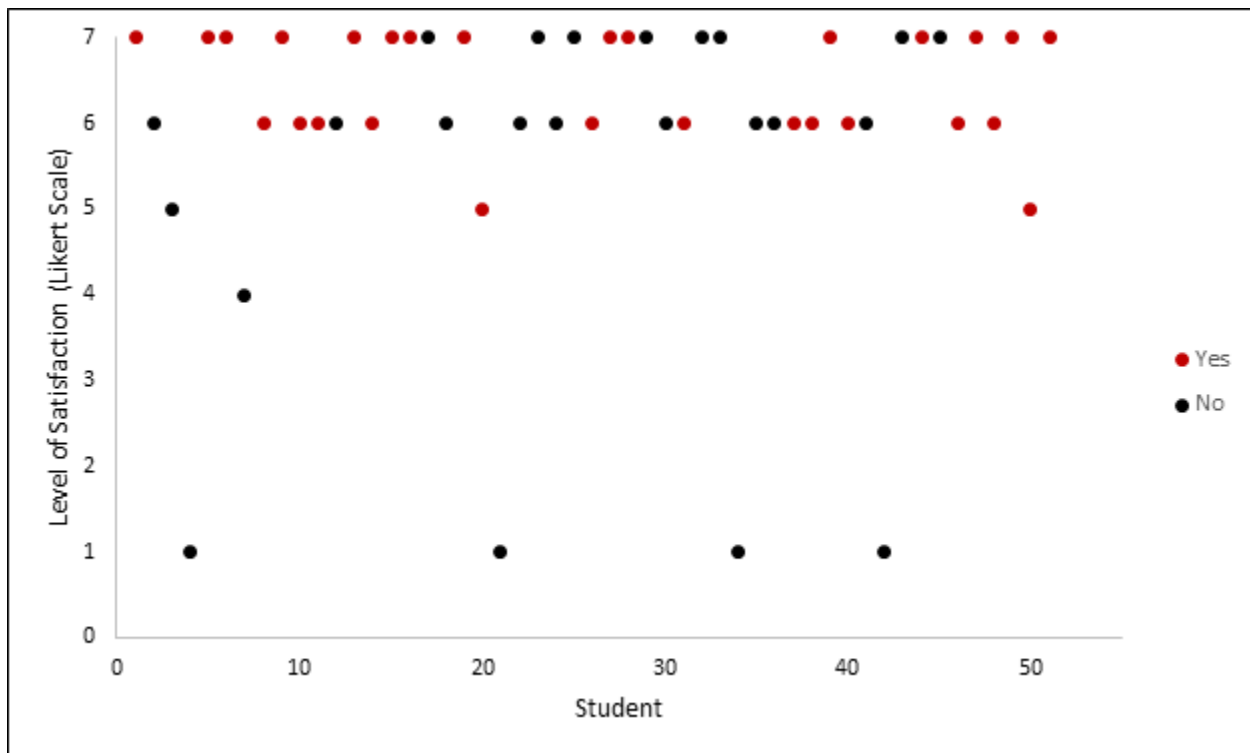
$\pm 1.26$ ; post-interest =  $5.16 \pm 1.39$ ), the difference was not statistically significant ( $p = 0.07$ ). Similarly, the difference between pre- and post-clinical interest levels for urban/city settings was not statistically different (pre-interest =  $5.46 \pm 1.25$ ; post-interest =  $5.36 \pm 1.48$ ,  $p = 0.498$ ).



**Figure 1. Change in interest for rural, underserved, and urban/city practice after clinical experience.** 7 = Very Interested, 6 = Interested, 5 = Somewhat Interested, 4 = Neutral, 3 = Somewhat Interested, 2 = Uninterested, 1 = Very Uninterested. Paired t-test revealed  $p < 0.05$  for rural settings, and  $p > 0.05$  for underserved and urban/city settings.

Regarding the length of rural and underserved clinical education experience, the largest proportion of respondents completed a six-week clinical education experience (54.9%), followed by 11 weeks (19.6%), 10.5 weeks (15.7%), and 12 weeks (9.8%) (Table 1). The correlation between the length of the clinical experience and students' rural interest was not significant ( $r_s = -0.18$ ,  $p = 0.20$ ). Similarly, the correlation between the length of the clinical education experience and students' interest in seeking underserved employment upon graduation was not significant ( $r_s = -0.03$ ,  $p = 0.83$ ).

Of the 51 students who completed the surveys, 28 (54.9%) reported they would have chosen a rural/underserved setting regardless of curriculum requirements and 23 (45.1%) would not (Table 1). Among these same students, those who would have answered “Yes” to choosing a rural/underserved full-time clinical education experience regardless of curriculum requirements also demonstrated significantly higher clinical satisfaction when compared to those who would have answered “No” if given the option (Yes =  $6.46 \pm 0.64$ , No =  $5.35 \pm 2.17$ ,  $p = 0.012$ ) (Figure 2). However, the correlation between a student’s desire to participate in a rural/underserved experience and clinical satisfaction in these settings was not significant ( $r_s = -0.26$ ,  $p = 0.07$ ). Similarly, a student’s understanding of rural/underserved practice ( $r_s = -0.07$ ,  $p = 0.65$ ) also demonstrated no correlation with a student’s desire to participate in these settings, whereas confidence in working in these same settings demonstrated a significant correlation with a student’s initial intent ( $r_s = -0.28$ ,  $p = 0.05$ ). Likewise, we also found that having a desire to participate in either setting regardless of curriculum requirements was significantly correlated with students’ post-clinical interest in seeking both rural ( $r_s = -0.36$ ,  $p = 0.01$ ) and underserved employment ( $r_s = -0.44$ ,  $p = 0.001$ ) upon graduation.



**Figure 2. Level of agreement with rural/underserved clinical satisfaction statement: “I was satisfied with my rural/underserved clinical experience.”**

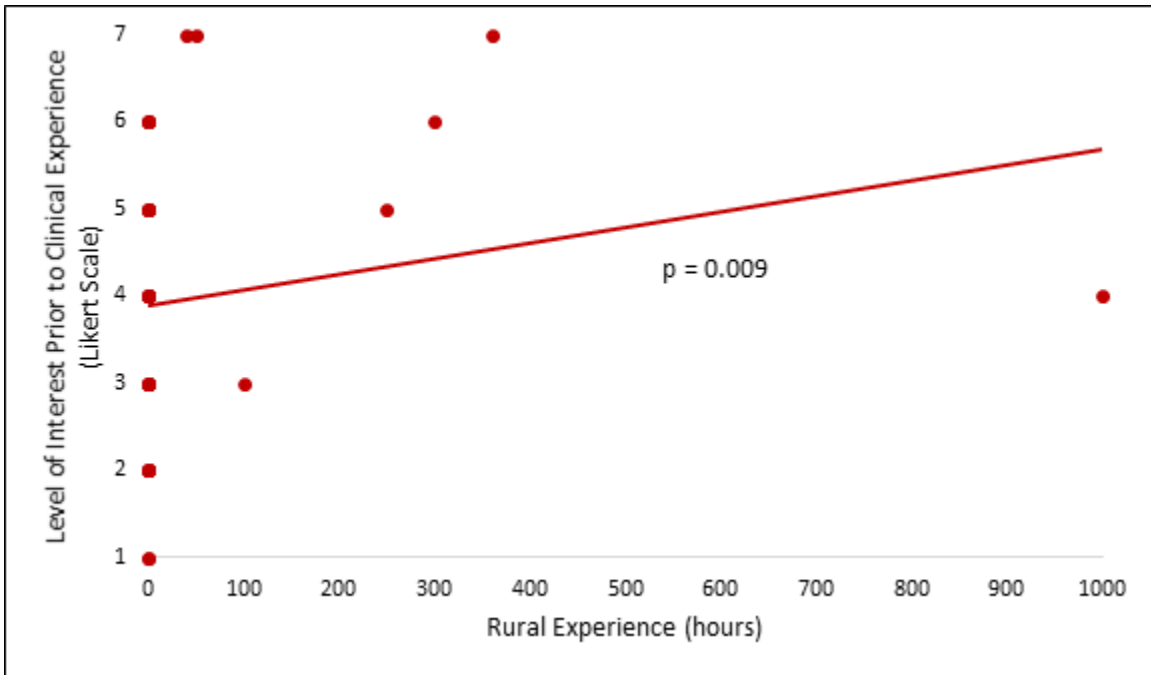
7 = Strongly Agree, 6 = Agree, 5 = Somewhat Agree, 4 = Neutral, 3 = Somewhat Disagree, 2 = Disagree, 1 = Strongly Disagree.

Note: “Yes” or “No” refers to whether or not a student would have chosen a rural/underserved setting regardless of curriculum requirements.

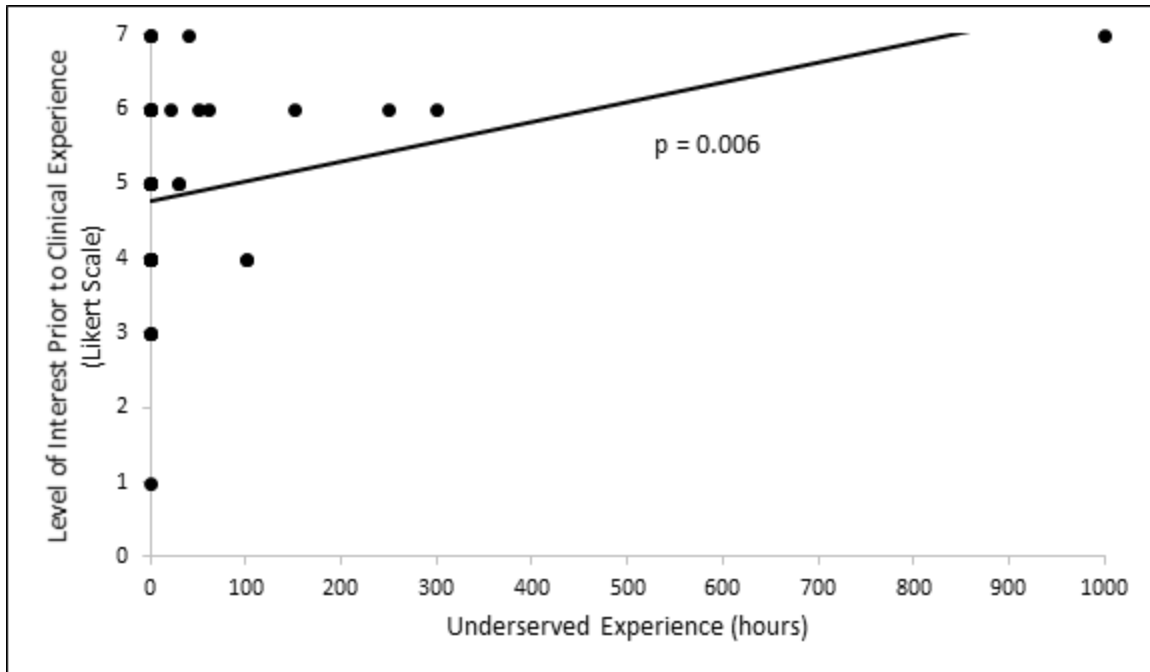
The relationship between participants’ upbringing and their interest in working in a rural or underserved setting upon graduation was also examined using Spearman’s correlation. Results from this test revealed that years spent living in a rural area from K-12 was not significantly correlated with students’ pre-clinical interest levels in seeking rural employment ( $r_s = 0.26, p = 0.07$ ). Similarly, student interest in seeking employment in an underserved setting upon graduation was not significantly correlated with the years spent living in that type of area ( $r_s = 0.11, p = 0.44$ ).

When looking at previous experience with observing, volunteering, or working in a rural/underserved setting prior to starting physical therapy school, 29 students (56.9%) reported having some exposure to either setting, while 22 students (43.1%) did not (Table 1). Having prior experience in

a rural setting was significantly correlated with the students' pre-clinical interest levels in seeking rural employment upon graduation ( $r_s = 0.36$ ,  $p = 0.009$ ) (Figure 3). Similarly, the number of hours a student spent observing, volunteering, or working in an underserved setting prior to physical therapy school was also correlated with their interest in working in this same setting upon graduation ( $r_s = 0.380$ ,  $p = 0.006$ ) (Figure 4).



**Figure 3. Correlation between students' previous experience in rural settings and pre-clinical levels of practice interest upon graduation.**  
7 = Very Interested, 6 = Interested, 5 = Somewhat Interested, 4 = Neutral, 3 = Somewhat Interested, 2 = Uninterested, 1 = Very Uninterested.



**Figure 4. Correlation between students' previous experience in underserved settings and pre-clinical levels of practice interest upon graduation.** 7 = Very Interested, 6 = Interested, 5 = Somewhat Interested, 4 = Neutral, 3 = Somewhat Interested, 2 = Uninterested, 1 = Very Uninterested.

To determine the factors that may influence physical therapy employment upon graduation, students were asked before and after their clinical education experiences to report their top three perceived barriers and benefits to rural, underserved, and urban/city practice (Tables 3-5). Options for response included "other" allowing for a self-generated response. About 25% of the responses in both the pre- and post-surveys reported *limited resources* as a main barrier of practicing in a rural setting. The other two common responses reported were *isolation* and *location*, both of which made up over 21% of the responses in both the pre- and post-surveys. The top three benefits to rural practice reported by students prior to their clinical education experiences were *loan repayment/incentives* (16.6%), *pay/benefits* (16.6%), and *connection to community* (15.9%). For the post-survey, *connection to community* was the most frequent benefit reported at 22.2%, followed by *pay/benefits* (15%), *proximity to nature* (14.4%), and *cost of living* (13.1%) (Table 3).

**Table 3. Frequency of reported barriers and benefits of rural practice based on student perceptions.**

	No. of responses (% of n)	
	Pre-survey	Post-survey
<b>Barriers</b>		
Total	156 (100)	152 (100)
Weather	1 (1)	3 (2)
Location	35 (22.4)	33 (21.7)
Isolation	37 (23.7)	32 (21.1)
Limited resources	39 (25)	40 (26.3)
Distance from family	26 (16.7)	26 (17.1)
Less educational opportunities	16 (10.3)	18 (11.8)
Other*	2 (1.3)	0 (0)
<b>Benefits</b>		
Total	157 (100)	153 (100)
Pay/benefits	26 (16.6)	23 (15)
Location	6 (3.8)	7 (4.6)
Connection to community	25 (15.9)	34 (22.2)
Job opportunities	14 (8.9)	10 (6.5)
Cost of living	21 (13.4)	20 (13.1)
Desire for rural quality of life	12 (7.6)	11 (7.2)
Close-knit hospital environment	8 (5.1)	10 (6.5)
Proximity to nature	17 (10.8)	22 (14.4)
Loan repayment/incentives	26 (16.6)	16 (10.5)
Other**	1 (1.1)	0 (0)

\*Students in pre-survey who chose “other” reported “Less ability to specialize” and “conservative culture/non-diverse population” as barriers.

\*\*Student in pre-survey who chose “other” reported “Wide range of patient population / treatment” as a benefit.

Note: due to survey design, some students were able to choose less than or greater than three barriers and benefits, resulting in different n values.

Prior to their clinical education experiences, the top barriers that students reported for underserved practice were *challenges of reimbursements* (27.6%), *limited resources* (24.3%), and *location* (18.4%) (Table 4). Upon completion of their rural or underserved clinical education experiences, these same three barriers were listed as the most common in post-surveys, with *limited resources* (24.5%) being the top reported barrier followed by *challenges of reimbursements* (21.9%), and *location* (17.9%) . The most frequently reported benefits for underserved practice in the pre-surveys were *special*



patient population (19.7%), community service (17.8%), loan repayment/incentives (15.8%), and pay/benefits (15.8%). After completion of their underserved clinical education experiences, students reported special patient population (20.9%) as the top benefit followed by job opportunities (19%) and pay benefits (17.6%).

**Table 4. Frequency of reported barriers and benefits of underserved practice based on student perceptions.**

	No. of responses (% of n)	
	Pre-survey	Post-survey
<b>Barriers</b>		
Total	152 (100)	151 (100)
Patient population	21 (13.8)	23 (15.2)
Location	28 (18.4)	27 (17.9)
Limited resources	37 (24.3)	37 (24.5)
Challenges of reimbursements	42 (27.6)	33 (21.9)
Pay/benefits	13 (8.6)	9 (6)
Less educational opportunities	11 (7.2)	19 (12.6)
Other*	0 (0)	3 (2)
<b>Benefits</b>		
Total	152 (100)	153 (100)
Pay/benefits	24 (15.8)	27 (17.6)
Location	4 (2.6)	1 (1)
Connection to community	18 (11.8)	17 (11.1)
Job opportunities	20 (13.2)	29 (19)
Cost of living	5 (3.8)	6 (3.9)
Community service	27 (17.8)	23 (15)
Special patient population	30 (19.7)	32 (20.9)
Loan repayment/incentives	24 (15.8)	18 (11.8)
Other	0 (0)	0 (0)

\*Students in post-survey who chose “other” reported “Job openings in a VA system,” and “Complexity of pt population (esp right out of school)” as barriers. Third student did not provide another barrier.

Note: due to survey design, some students were able to choose less than or greater than three barriers and benefits, resulting in different n values.

Up to 30.1% of the students in the pre-survey had *high cost of living* as the top barrier to urban/city practice while responses from the post-survey had *traffic/commute* (29.8%) as the top barrier (Table 5). *Traffic/commute* (28.8%) and *overcrowding* (26.8%) were the 2<sup>nd</sup> and 3<sup>rd</sup> ranked barriers in the

pre-survey compared to post-survey results which had *high cost of living* (28.5%) and *overcrowding* (25.8%) as 2<sup>nd</sup> and 3<sup>rd</sup> ranked barriers. Prior to their rural or underserved clinical education experiences, the top benefits to urban/city practice reported were *location* (21.1%), *employment opportunities* (13.7%) and *practice specialization* (12.4%). Upon completion of their clinical education experiences, *location* (17%), *employment opportunities* (15.1%), and *proximity to family* (13.8%) were reported as the top 3 benefits.

**Table 5. Frequency of reported barriers and benefits of *urban/city* practice based on student perceptions.**

	No. of responses (% of n)	
	Pre-survey	Post-survey
<b>Barriers</b>		
Total	153 (100)	151 (100)
High cost of living	46 (30.1)	43 (28.5)
Pollution	5 (3.3)	5 (3.3)
Overcrowding	41 (26.8)	39 (25.8)
High rate of crime	11 (7.2)	12 (7.9)
Lack of privacy	5 (3.3)	5 (3.3)
Traffic/commute	44 (28.8)	45 (29.8)
Other*	1 (1)	2 (1.3)
<b>Benefits</b>		
Total	161 (100)	159 (100)
Location	34 (21.1)	27 (17)
Proximity to family	19 (11.8)	22 (13.8)
Proximity to malls/recreational facilities/ cinemas, etc.	18 (11.2)	15 (9.4)
Educational opportunities	10 (6.2)	19 (11.9)
Desire for urban quality of life	17 (10.6)	17 (10.7)
Employment opportunities	22 (13.7)	24 (15.1)
Practice specialization	20 (12.4)	19 (11.9)
Larger healthcare environment	19 (11.8)	16 (10.1)
Other**	2 (1.2)	0 (0)

\*Student in pre-survey who chose “other” did not provide another barrier. Students in post survey reported “# of pt’s per day in order for reimbursement,” and “less personal patient experience because of an increased caseload due to larger population” as barriers.

\*\*Students in pre-survey who chose “other” reported “Proximity to hospital, fire department, etc.” and “diverse population” as benefits.

Note: due to survey design, some students were able to choose less than or greater than three barriers and benefits, resulting in different n values.

## Discussion

In our study of one DPT program across 3 cohorts, student satisfaction with their clinical education experiences and the number hours they spent before PT school in rural and underserved settings observing, volunteering, or working were the primary indicators of a student's interest in seeking employment in these settings post-graduation. Previous research has demonstrated the effects of rural experiences in physician and nursing education, but information on the effect of these experiences in the training of physical therapists has been limited. As the need for physical therapy services continue to increase in rural and underserved areas around the country, educational administrators, employers, and health service organizations will need to be aware of potential employment factors to make informed decisions regarding curricular design changes, recruitment, and retention to improve the availability of health services in these settings.

While previous studies on nursing and medical students have shown rural upbringing to be one of the largest predictors of rural practice<sup>12,14</sup>, we found that the number of years a student spent in a rural or underserved area from K-12 was not significantly correlated with practice interest for either setting. Instead, we found that the main contributing factor was having previous experience observing, volunteering, or working in a rural or underserved setting. We believe this finding is related to a student's understanding of rural or underserved practice and possibly having more hands-on experience prior to starting physical therapy school. This also suggests that while clinical education experience may positively alter students' interest, a better indicator of whether students pursue rural or underserved employment upon graduation may be exposure before graduate school as volunteers or employees in a physical therapy practice.

In addition, we suspected that clinical education experience duration would influence interest in seeking employment post-graduation. However, our findings were that duration in a setting did not influence interest levels. We believe that the differences in duration among our clinical experiences (6, 10.5, 11, and 12-week experiences) were not enough to cause any significant changes in students' levels of interest, which again supports the idea that previous experience in a rural or underserved setting is a stronger predictor of post-graduation employment.

Similar to previous studies, our findings also demonstrated the positive impact of rural or underserved clinical education experiences on student perceptions of future practice in those settings.<sup>20</sup> <sup>21</sup> Although the difference between pre-clinical and post-clinical interest levels in underserved settings were not significant, an overall positive trend in interest towards seeking rural and underserved employment was seen. In addition to this, 90.2% of the respondents reported being satisfied with their clinical education experience, 90.2% reported gaining a greater understanding of rural/underserved practice, and 92.2% had more confidence in their clinical abilities. These results suggest that incorporating rural and underserved clinical requirements are beneficial for students and may ultimately increase the likelihood of seeking employment in these settings upon graduation.

Since no data was collected from these students after graduation, it is possible that other factors (e.g. spouse or partner, children, residency) that occur after physical therapy school may have an even greater impact in rural/underserved employment. To determine what some of these factors may be, students were asked to report some of their perceived barriers and benefits of rural, underserved, and urban/city practice upon graduation. In an urban/city setting respondents reported high cost of living and traffic/commute as the two main barriers, while location and employment opportunities were commonly listed as the greatest benefits. Our subjects reported that limited resources were a major barrier to working in a rural or underserved setting, while pay/benefits was commonly listed as one of

the greatest benefits. It is important to note that the top barriers to rural practice reported in the pre-survey were the same top barriers reported in the post-survey, and that the top benefits to rural practice reported in the pre-survey differed in the post-survey. The biggest change in perceived benefits to rural practice (pre-survey to post-survey) occurred in *connection to community* which increased from 15.9% to 22.2%, and *loan repayment incentives* which decreased from 16.6% to 10.5%.

These results may help to inform DPT program admission policies as well as didactic and clinical education curriculum decisions where rural or underserved employment of graduates is desired. For rural states such as Nevada these results may be even more important to help reduce the shortage of physical therapists in rural and underserved settings. Most importantly, admission policies that favor students with rural or underserved clinical practice experience and not just place of residence may be the most effective strategy to help promote student employment in these settings post-graduation.

Although this study presents some of the benefits of incorporating rural/underserved full-time clinical education experiences into physical therapy program curriculums, further research is still needed. First, because this data was obtained from a small sample of 50 students at a single DPT program, these findings may not generalize to different student populations. In addition to this, the students' knowledge of participation in the study may also have some influence on the survey responses, resulting in data that may be biased towards favorable outcomes. The change in Likert scale from its original 10-point to a 7-point scale would benefit from psychometric testing. Future studies should also include more students from multiple physical therapy programs. In addition to this, collecting data on actual employment post-graduation would confirm whether or not clinical education experiences really do have an impact on career choices. Furthering determination of student interest post clinical experiences in the future should also include assessment of their satisfaction and likelihood of seeking employment in other settings as well.

**Appendix 1**  
**Pre-Experience Survey**

**Title of Study: Physical Therapy Practice Interest Amongst Doctor of Physical Therapy Students Prior to and After Rural or Underserved Clinical Affiliations**

**Investigator(s) and Contact Phone Number:** Carrie Gillis, Keoni Kins, Daniel Young, Brandon Godin, Mac Neil Moresca, Tyler Satoshige, and Trenton Poulson. 702-895-4768

The purpose of this study is to determine the effects of rural/underserved clinical experiences on student perception of educational value of affiliations and interest in working in a rural or underserved setting. In addition, to examine if demographics are predictors of the desire an individual has for rural employment. You are being asked to participate in the study because you meet the following criteria: DPT student, age between 18 and 50, enrolled in the Physical Therapy Department at the University of Nevada Las Vegas, who is about to begin or has just finished a required rural or underserved clinical affiliation.

If you volunteer to participate in this study, you will be asked to do the following: Complete a survey 1 week prior to the required rural or underserved clinical affiliation, and another survey the week following the same clinical affiliation.

This study includes only minimal risks. The study will take 10-20 minutes of your time (5-10 minutes per survey). You will not be compensated for your time.

For questions regarding the rights of research subjects, any complaints or comments regarding the manner in which the study is being conducted you may contact **the UNLV Office of Research Integrity – Human Subjects at 702-895-2794, toll free at 877-895-2794, or via email at IRB@unlv.edu.**

Your participation in this study is voluntary. You may withdraw at any time. You are encouraged to ask questions about this study at the beginning or any time during the research study.

Please proceed to the next page for participant consent.

---

**Participant Consent:** I have read the above information and agree to participate in this study. I acknowledge that completing and submitting this survey serves as my consent, and that a copy of the informed consent form has been provided to me.

This study involves a pre and post affiliation survey. For the purposes of the study, please use the following definitions (UNLVPT definitions) as you complete the survey:

**Rural:** Any population consisting of any city, town, territory, incorporated or unincorporated, that the most current US Census approximates to be less than 50,000 persons AND the population is greater than 50 miles from the nearest Level II trauma center as designated by state and local authorities.

**Underserved:** Medically underserved areas have a shortage of primary care health services for residents within a geographic area.

**Urban/City:** Any population consisting of any city, town, territory, incorporated or unincorporated, that the most current US Census approximates to be more than 50,000 persons.

---

Please enter your unique identifier:

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Please indicate your current age:

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Please indicate your identified gender:

- Male (1)
  - Female (2)
  - Transgender (3)
- 

Please indicate your ethnicity:

- Hispanic/Latino (1)
  - Not Hispanic/Latino (2)
-

Please indicate your race:

- African-American/Black (non-Hispanic) (1)
  - American Indian/Alaskan Native (2)
  - Asian (3)
  - Native Hawaiian/Other Pacific Islander (4)
  - Caucasian/White (not of Hispanic origin) (5)
- 

Please indicate your year in a Doctorate of Physical Therapy Program:

- 1st year (1)
  - 2nd year (2)
  - 3rd year (3)
- 

At the present time, what is your level of interest in practicing in a rural area?

	Very Uninterested (1)	Uninterested (2)	Somewhat Uninterested (3)	Neutral (4)	Somewhat Interested (5)	Interested (6)	Very Interested (7)
Rural (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

---



What do you perceive as the top three benefits of working in a Rural area? If other, please explain.

- Pay / benefits (1)
  - Location (2)
  - Connection to community (3)
  - Job opportunities (4)
  - Cost of living (5)
  - Desire for rural quality of life (6)
  - Close-knit hospital environment (7)
  - Proximity to nature (8)
  - Loan repayment / incentives (9)
  - Other (10) \_\_\_\_\_
- 

What do you perceive as the top three barriers to working in a Rural area? If other, please explain.

- Weather (1)
  - Location (2)
  - Isolation (3)
  - Limited resources (4)
  - Distance from family (5)
  - Less educational opportunities (6)
  - Other (7) \_\_\_\_\_
-

At the present time, what is your level of interest in practicing in an underserved area?

	Very Uninterested (1)	Uninterested (2)	Somewhat Uninterested (3)	Neutral (4)	Somewhat Interested (5)	Interested (6)	Very Interested (7)
Underserved (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

---

What do you perceive as the top three benefits of working in an Underserved area? If other, please explain.

- Pay / benefits (1)
  - Location (2)
  - Connection to community (3)
  - Job opportunities (4)
  - Cost of living (5)
  - Community service (6)
  - Special patient population (7)
  - Loan repayment / incentives (8)
  - Other (9) \_\_\_\_\_
-

What do you perceive as the top three barriers to working in an Underserved area? If other, please explain.

- Patient population (1)
  - Location (2)
  - Limited resources (3)
  - Challenges for reimbursement (4)
  - Pay / benefits (5)
  - Less educational opportunities (6)
  - Other (7) \_\_\_\_\_
- 

At the present time, what is your level of interest in practicing in an Urban/City area?

	Very Uninterested (1)	Uninterested (2)	Somewhat Uninterested (3)	Neutral (4)	Somewhat Interested (5)	Interested (6)	Very Interested (7)
Urban/City (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

---




What do you perceive as the top three benefits of working in an Urban/City area? If other, please explain.

- Location (1)
  - Proximity to family (2)
  - Proximity to malls/recreational facilities/cinemas etc. (3)
  - Educational opportunities (4)
  - Desire for urban quality of life (5)
  - Employment opportunities (6)
  - Practice specialization (7)
  - Larger healthcare environment (8)
  - Other (9) \_\_\_\_\_
- 

What do you perceive as the top three barriers to working in an Urban/City area? If other, please explain.

- High cost of living (1)
  - Pollution (2)
  - Overcrowding (3)
  - High rate of crime (4)
  - Lack of privacy (5)
  - Traffic / commute (6)
  - Other (7) \_\_\_\_\_
-

Please indicate how many years of your K-12 education you spent in each of the following areas:

Rural (1)	
Underserved (2)	
Urban/City (3)	

Prior to Physical Therapy school, did you perform observation, work, or volunteer hours in a rural or underserved area?

- Yes (1)
- No (2)




How many hours did you spend in a Rural area?

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How many hours did you spend in an Underserved area?




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Our Doctor of Physical Therapy Program allows for 39 weeks of clinical affiliations. How many of those weeks would you prefer to spend in each of the following areas?

Rural (1)	
Underserved (2)	
Urban/City (3)	

---

Upon graduation from a Doctor of Physical Therapy Program, how much of your first 5 years of employment would you like to spend in the following areas?

Rural (1)	
Underserved (2)	
Urban/City (3)	

End of Block

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## Appendix 2

### Post-Experience Survey

**Participant Consent:** I agree to participate in this study and acknowledge that completing and submitting this survey serves as my consent, and that a copy of the informed consent form has been provided to me.

This study involves a pre and post affiliation survey. For the purposes of the study, please use the following definitions (UNLVPT definitions) as you complete the survey:

**Rural:** Any population consisting of any city, town, territory, incorporated or unincorporated, that the most current US Census approximates to be less than 50,000 persons AND the population is greater than 50 miles from the nearest Level II trauma center as designated by state and local authorities.

**Underserved:** Medically underserved areas have a shortage of primary care health services for residents within a geographic area.

**Urban/City:** Any population consisting of any city, town, territory, incorporated or unincorporated, that the most current US Census approximates to be more than 50,000 persons.

If you have participated in more than 1 underserved/rural clinical affiliation, please answer the following questions based on your **FIRST** underserved/rural clinical affiliation.

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Please enter your unique identifier from the previous survey:

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Please indicate which educational experience your rural/underserved clinical affiliation was associated with:

- DPT 761 (1)
- DPT 762 (2)
- DPT 763 (3)
- DPT 764 (4)

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Please identify if your experience was:

- Rural (1)
  - Underserved (2)
  - Rural/Underserved (3)
- 

At the present time, what is your level of interest in practicing in a rural area?

	Very Uninterested (1)	Uninterested (2)	Somewhat Uninterested (3)	Neutral (4)	Somewhat Interested (5)	Interested (6)	Very Interested (7)
(1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

---



What do you perceive as the top three benefits of working in a Rural area? If other, please explain.

- Pay / benefits (1)
  - Location (2)
  - Connection to community (3)
  - Job opportunities (4)
  - Cost of Living (5)
  - Desire for rural quality of life (6)
  - Close-knit hospital environment (7)
  - Proximity to nature (8)
  - Loan repayment / incentives (9)
  - Other (10) \_\_\_\_\_
- 

What do you perceive as the top three barriers to working in a Rural area? If other, please explain.

- Weather (1)
- Location (2)
- Isolation (3)
- Limited resources (4)
- Distance from family (5)
- Less educational opportunities (6)
- Other (7) \_\_\_\_\_

---

At the present time, what is your level of interest in practicing in an underserved area?

	Very Uninterested (1)	Uninterested (2)	Somewhat Uninterested (3)	Neutral (4)	Somewhat Interested (5)	Interested (6)	Very Interested (7)
(1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

---

What do you perceive as the top three benefits of working in an Underserved area? If other, please explain.

- Pay / benefits (1)
  - Location (2)
  - Connection to community (3)
  - Job opportunities (4)
  - Cost of Living (5)
  - Community service (6)
  - Special patient population (7)
  - Loan repayment / incentives (8)
  - Other (9) \_\_\_\_\_
-

What do you perceive as the top three barriers to working in an Underserved area? If other, please explain.

- Patient population (1)
  - Location (2)
  - Limited resources (3)
  - Challenges of reimbursement (4)
  - Pay / benefits (5)
  - Less educational opportunities (6)
  - Other (7) \_\_\_\_\_
- 

At the present time, what is your level of interest in practicing in an Urban/City area?

	Very Uninterested (1)	Uninterested (2)	Somewhat Uninterested (3)	Neutral (4)	Somewhat Interested (5)	Interested (6)	Very Interested (7)
(1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

---

What do you perceive as the top three benefits of working in an Urban/City area? If other, please explain.

- Location (1)
  - Proximity to family (2)
  - Proximity to malls/recreational facilities/cinemas etc. (3)
  - Educational opportunities (4)
  - Desire for urban quality of life (5)
  - Employment opportunities (6)
  - Practice specialization (7)
  - Larger healthcare environment (8)
  - Other (9) \_\_\_\_\_
- 

What do you perceive as the top three barriers to working in an Urban/City area? If other, please explain.

- High cost of living (1)
  - Pollution (2)
  - Overcrowding (3)
  - High rate of crime (4)
  - Lack of privacy (5)
  - Traffic / commute (6)
  - Other (7) \_\_\_\_\_
-

This experience has helped develop my confidence in my clinical abilities.

	Strongly Disagree (1)	Disagree (2)	Somewh at Disagree (3)	Neutral (4)	Somewh at Agree (5)	Agree (6)	Strongly Agree (7)
1 (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

---

I believe I gained a greater understanding of what it would be like to practice in a rural/underserved setting.

	Strongly Disagree (1)	Disagree (2)	Somewh at Disagree (3)	Neutral (4)	Somewh at Agree (5)	Agree (6)	Strongly Agree (7)
(1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

---

I was satisfied with my rural/underserved clinical experience.

	Strongly Disagree (1)	Disagree (2)	Somewh at Disagree (3)	Neutral (4)	Somewh at Agree (5)	Agree (6)	Strongly Agree (7)
(1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

---

I believe location plays a huge role in the job setting I choose.

	Strongly Disagree (1)	Disagree (2)	Somewh at Disagree (3)	Neutral (4)	Somewh at Agree (5)	Agree (6)	Strongly Agree (7)
(1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

---

Salary and benefits play a huge role in the job setting I choose.

	Strongly Disagree (1)	Disagree (2)	Somewh at Disagree (3)	Neutral (4)	Somewh at Agree (5)	Agree (6)	Strongly Agree (7)
(1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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Would you have chosen a rural/underserved setting if there was no rural/underserved requirement from your academic program?

- Yes (1)
  - No (2)
- 

What did you enjoy most about your rural/underserved clinical experience?

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What did you least enjoy about your rural/underserved clinical experience?

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What appeals to you the most about working in a rural/underserved setting?

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What appeals to you the least about working in a rural/underserved setting?

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If you chose to participate in an underserved affiliation rather than participating in a rural affiliation to fulfill the program requirement, what influenced your decision to do so?

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## Curriculum Vitae

**Brandon W. Godin, SPT**

Godinb32b@gmail.com

### Licensure as a Physical Therapist

- Nevada State Board of Physical Therapy Examiners, Test Date: July 24, 2019

### Professional Membership

- American Physical Therapy Association, ID: 761501 (2016-Current)
  - Section or Research, member
  - Academy of Orthopaedic Physical Therapy, member
- Nevada Physical Therapy Association, member (2016-Current)

### Education

DPT	<b>University of Nevada, Las Vegas</b> Las Vegas, Nevada	2016 – 2019	Doctor of Physical Therapy
PhD	<b>University of Nevada, Reno</b> Reno, Nevada	2014 – 2016	Biochemistry, Candidate
BS	<b>University of Nevada, Reno</b> Reno, Nevada	2009 – 2014	Biology, Molecular Biology, Biochemistry

### Professional Experience

- Student Physical Therapist - Lander Physical Therapy (July 2017-August 2017)
  - Battle Mountain, Nevada
  - Supervised by: Mary Bengoa, MPT
- Student Physical Therapist - The Orthopedic Specialty Hospital, Intermountain Healthcare (July 2018-October 2018)
  - Murray, Utah
  - Supervised by: Dr. Tyler Peck, DPT
- Student Physical Therapist - Advanced Healthcare of Reno (October 2018-December 2018)
  - Reno, Nevada
  - Supervised by: Dr. Aaron Copeland, DPT and Angela Cook, MPT
- Student Physical Therapist - Fyzical Balance and Therapy Center, Keith Kleven Institute (January 2019-April 2019)
  - Las Vegas, NV
  - Supervised by: Dr. Micah Weber, DPT

### Research Activities

- Graduate Student; Department of Physical Therapy, University of Nevada, Las Vegas (2016-2019)
  - Dr. Carrie Gillis, DPT and Dr. Keoni Kins, DPT
- Graduate Student, Department of Biochemistry and Molecular Biology, University of Nevada, Reno (2015-2016)
  - Dr. Christine Cremo, PhD

- Laboratory Technician and Researcher, Department of Biochemistry and Molecular Biology, University of Nevada, Reno (2014-2015)
  - Dr. Ian Wallace, PhD
- Undergraduate Researcher, Department of Biochemistry and Molecular Biology, University of Nevada, Reno (2013-2014)
  - Dr. David Schooley, PhD

#### **Invited Talks and Presentations**

- **Godin, B.G.**, Moresca, M.N., Poulson, T., Satoshige, T., Young, D.L., Kins, K., and Gillis, C. Rural or Underserved Practice Interest Among Doctor of Physical Therapy Students: Do Clinical Experiences Change Opinions? University of Nevada, Las Vegas Department of Physical Therapy Thesis Presentation. May 17<sup>th</sup>, 2019. Las Vegas, NV.
- **Godin, B.G.**, Moresca, M.N., Poulson, T., Satoshige, T., Young, D.L., Kins, K., and Gillis, C. Rural or Underserved Practice Interest Among Doctor of Physical Therapy Students: Do Clinical Experiences Change Opinions? APTA Combined Sections Meeting poster presentation. January 25<sup>th</sup>, 2019. Washington, D.C.
- **Godin, B.G.**, Sen, S., Schegg, K., and Schooley, D. Isolation and identification of an Isoprenoid Transport Protein Using an Isopentenyl Pyrophosphate Analog. University of Nevada, Reno Undergraduate Senior Thesis poster symposium. May 7<sup>th</sup>, 2014. Reno, NV.

#### **Professional Development and Continuing Education**

- Combined Sections Meeting (February 2017) – San Antonio, Texas
  - Advanced Cervicothoracic and Shoulder Interventions for Upper Limb Symptoms
  - Update on Minimal Footwear – Is Less More?
  - Fibromyalgia, Chronic Fatigue Syndrome, Etc: Treat the Patient, Not the Label
  - Interdisciplinary Fitness, Wellness, and Chronic Disease Management for Children
  - Therapeutic Technologies: Peripheral Arterial Disease and Diabetes Mellitus
- HawkGrips Level I: IASTM Fundamentals (August 2017) – Las Vegas, NV
  - Certified HawkGrips Practitioner
- Nevada Physical Therapy Association Annual Business Meeting (September 23, 2017)
- Combined Sections Meeting (January 2019) – Washington D.C.
  - Elbow Biomechanics and Rehab of the Overhead Throwing Athlete
  - Clinical Practice Guideline: Shoulder Stability and Movement Coordination Deficits
  - Undertreating 40% of your Patients? The Older Adult in the Outpatient Office
  - Pain talks: Conversations with Pain Science Leaders on the Future of the Field
  - The Athlete in Pain: Moving Beyond the Tissues to the Person

#### **Teaching Activities**

- Teaching Assistant for Biochemistry 403: Biochemistry Lab, University of Nevada, Reno (2014-2016)
- Teaching Assistant for Biochemistry 303: Biochemistry Analysis, University of Nevada, Reno (2014-2016)
- Senior thesis mentor, University of Nevada, Reno (2014-2016)

#### **Honors and Awards**

- University of Nevada, Reno College of Agriculture, Biotechnology, and Natural Resources Medal (2014)
- College of Science Graduation Honors (2014)
- Alpha Epsilon Delta Health Sciences Honor's Society (2010-2014)
- Associated Students of the University of Nevada Scholarship (2012-2013)
- Undergraduate Access Grant (2012-2013)
- Nevada State Grant (2012-2014)
- Regents Undergraduate Grant (2011-2012)

**Outreach:**

- Physical Therapy Aid Volunteer (2015-2016)
- Challenger Project Volunteer (2009-2012)
- Campbell's Can Hunger Volunteer and Coordinator (2013)
- Enactus Project for Nevada's Recovery and Prevention of Substance Abuse (2011-2013)
- Jacob's Well Youth Center Volunteer Tutor (2009-2016)
- Lander County Hospice Volunteer Caregiver (2010-2015)
- Physician Shadowing (2010-2014)

**Mac Neil A. Moresca, SPT**  
macneilmoresca@gmail.com

**Licensure as a Physical Therapist**

- Nevada State Board of Physical Therapy Examiners, Test Date: April 23, 2019 (PASSED)

**Professional Membership**

- Member of American Physical Therapy Association (2016 – present)
- Member of Nevada Physical Therapy Association (2016 – present)

**Education**

DPT	<b>University of Nevada, Las Vegas</b> Las Vegas, Nevada	2016 – 2019	Physical Therapy
BS	<b>University of Hawaii at Manoa</b> Honolulu, Hawaii	2010 – 2014	Kinesiology and Rehabilitation Sciences

**Professional Experience**

- Encompass Health Hospital of Henderson | Henderson, NV
  - Student Physical Therapist (January 2019 – March 2019) | Inpatient Rehab
- Mike O’Callaghan Federal Hospital, Nellis Air Force Base | North Las Vegas, NV
  - Student Physical Therapist (October 2018 – December 2018) | Outpatient Orthopedics
- St. Rose Dominican Hospital – San Martin Campus | Las Vegas, NV
  - Student Physical Therapist (July 2018 – September 2018) | Inpatient Acute
- Kelly Hawkins Physical Therapy Works – Henderson | Henderson, NV
  - Student Physical Therapist (July 2017 – August 2017) | Outpatient Orthopedics

**Research Activities**

- Godin B, **Moresca MN**, Poulson T, Satoshige T, Young D, Kins K, Gillis C. Rural or Underserved Practice Interest Amongst Doctor of Physical Therapy Students: Do Clinical Affiliations Change Opinions?
  - University of Nevada, Las Vegas: Department of Physical Therapy Thesis Presentation – Las Vegas, NV (May 2019)
  - Poster presentation: APTA Combined Sections Meeting – Washington, DC (January 2019)

**Professional Development and Continuing Education**

- HawkGrips Level I: IASTM Fundamentals – Las Vegas, NV, 9 hours
  - Presented by Ted Forcum (August 26, 2017)

**Honors and Awards**

- UNLVPT Scholarship (2017-19)
- Western Interstate Commission for Higher Education (WICHE) Recipient (2016-19)

**Trenton N. Poulson, SPT**  
Trent.n.poulson@gmail.com

### Licensure as a Physical Therapist

- Physical Therapy Licensure pending graduation (May 2019)

### Professional Membership

- American Physical Therapy Association, ID: 761627 (2016-Current)
  - Academy of Acute Care Physical Therapy
  - Academy of Neurologic Physical Therapy
  - Academy of Orthopedic Physical Therapy
  - Academy of Cardiovascular & Pulmonary Physical Therapy
  - Academy of Geriatric Physical Therapy
  - Academy of Oncologic Physical Therapy
- Nevada Physical Therapy Association (2016-Current)

### Education

DPT	<b>University of Nevada, Las Vegas</b> Las Vegas, Nevada	2016 – 2019	Doctor of Physical Therapy
BS	<b>Utah Valley University</b> Orem, Utah	2008 – 2015	Exercise Science

### Professional Experience

- **Student Physical Therapist** – Select Physical Therapy (July 2017 – August 2017)  
821 N Nellis Blvd Suite 130, Las Vegas, NV 89110
- **Student Physical Therapist** – Cleveland Clinic (July 2018 – September 2018)  
888 W Bonneville Ave, Las Vegas, NV 89106
- **Student Physical Therapist** – Sunrise Hospital (October 2018 – December 2018)  
3186 S. Maryland Pkwy, Las Vegas, NV 89109
- **Student Physical Therapist** – Summerlin Hospital (January 2019 – March 2019)  
657 N. Town Center Drive, Las Vegas, NV 89144

### Research Activities

- Graduate Student; Department of Physical Therapy, University of Nevada, Las Vegas (2016-2019)
  - Dr. Daniel Young, DPT, Dr. Carrie Gillis, DPT and Dr. Keoni Kins, DPT

### Invited Talks and Presentations

- Godin, B.G., Moresca, M.N., **Poulson, T.**, Satoshige, T., Young, D.L., Kins, K., and Gillis, C. Rural or Underserved Practice Interest Among Doctor of Physical Therapy Students: Do Clinical Experiences Change Opinions? University of Nevada, Las Vegas Department of Physical Therapy Thesis Presentation. May 17<sup>th</sup>, 2019. Las Vegas, NV.

### Professional Development and Continuing Education

- Combined Sections Meeting – February 16-18, 2017
  - Anne Shumway-Cook Lecture: You Can Let Go of Me Now
  - Academy of Neurologic Physical Therapy Platform Session I
  - Fatigue in Neurologic Disorders: Pathophysiology, Evaluation, and Intervention
  - Science Meets Practice: Rotator Cuff Tears, Surgical Repairs, and Rehabilitation
  - Fibromyalgia, Chronic Fatigue Syndrome, Etc: Treat the Patient, Not the Label
  - Triggering Plasticity to Improve Rehabilitation Outcomes After Neurologic Injury
  - Harnessing Neuroplasticity with Brain Stimulation and Rehabilitation
  - A Cognitive-Biomechanical Approach to Common Chronic Musculoskeletal Conditions
  - Optimizing Motor Learning in Rehabilitation: Optimal Theory and Applications
- Nevada Physical Therapy Association Annual Business Meeting (September 23, 2017)
- Carolee Winstein, PhD, PT, FAPTA “Past, Present, and Future of Neurologic Physical Therapy” (November 17-18, 2016)
- Sharon Dunn, DPT “APTA: Pursuing our Transformative Vision” (October 26, 2017)
- Sharon Dunn, DPT “Disruption and Opportunity in Health Delivery: Go Hard or Go Home” (October 27, 2017)

#### **Honors and Awards**

- University of Nevada, Las Vegas Physical Therapy Scholarship (2016, 2017, 2018)

#### **Service**

- University of Nevada, Las Vegas Department of Physical Therapy: Student Participant on Campus Tour and Interviewee Escort (January 2017, 2018)
- Cardiac Risk Factors Research Participant: Dieu-My T. Tran, Ph.D. RN, CNE (April 2017)
- Cupping Effects on Hamstring Flexibility Research Participant: Matthew Shafer, Graduate Program in Athletic Training (October 2017)
- The Church of Jesus Christ of Latter-Day Saints
  - Service/Humanitarian Mission – Mexico (February 2009 – February 2011)
  - Instructor (July 2016 – December 2018)
  - Counselor to the Elder’s Quorum President (February 2017 – April 2018)
  - Boy Scouts of America: Cub Scouts – Webelos Leader (December 2017 – February 2019)



**Tyler T. Satoshige, PT**  
tsatoshige@gmail.com

### **Licensure as a Physical Therapist**

- Nevada State Board of Physical Therapy Examiners, Test Date: April 23, 2019

### **Professional Membership**

- American Physical Therapy Association, (2017-Current)
  - Academy of Orthopaedic Physical Therapy, member
- Nevada Physical Therapy Association, member (2016-Current)

### **Education**

DPT	<b>University of Nevada, Las Vegas</b> Las Vegas, Nevada	2016 – 2019	Doctor of Physical Therapy
BS	<b>Washington State University,</b> <b>Pullman</b> Pullman, WA	2010 – 2014	Kinesiology

### **Professional Experience**

- Student Physical Therapist – Complex Care Hospital (January 2019-April 2019)
  - Las Vegas, NV
  - Supervised by: Dr. Michael Bitterman, DPT
- Student Physical Therapist – Tim Solder Physical Therapy (October 2018-December 2018)
  - Henderson, NV
  - Supervised by: Mr. Calvin Wang, MPT
- Student Physical Therapist – MountainView Hospital (July 2018-October 2018)
  - Las Vegas, NV
  - Supervised by: Mr. Steve Gottfredson, MPT
- Student Physical Therapist – Optimal Physical Therapy (July 2017-August 2017)
  - Henderson, NV
  - Supervised by: Dr. Jason Melton, DPT

### **Research Activities**

- Graduate Student; Department of Physical Therapy, University of Nevada, Las Vegas (2016-2019)
  - Dr. Carrie Gillis, DPT and Dr. Keoni Kins, DPT

### **Invited Talks and Presentations**

- Godin, B.G., Moresca, M.N., Poulson, **T., Satoshige**, T., Young, D.L., Kins, K., and Gillis, C. Rural or Underserved Practice Interest Among Doctor of Physical Therapy Students: Do Clinical Experiences Change Opinions? University of Nevada, Las Vegas Department of Physical Therapy Thesis Presentation. May 17<sup>th</sup>, 2019. Las Vegas, NV.

### **Professional Development and Continuing Education**

- Combined Sections Meeting (February 2017) – San Antonio, Texas
  - Total Joint Arthroplasty in Acute Care: Way Beyond Ice, CPM and Transfers

- Update on Minimal Footwear – Is Less More?
- Beyond 3 Sets of 10: Individualized Exercise Prescription for Chronic Conditions
- The Nuts and Bolts of Sports Physical Therapy: Treating the Common Conditions
- Managing the Recreational Runner from Head to Toe
- HawkGrips Level I: IASTM Fundamentals (August 2017) – Las Vegas, NV
  - Certified HawkGrips Practitioner

**Outreach:**

- Judith Steele Elementary Volunteer (03/2017)
- Rock 'n' Roll Marathon (11/2016)
- Opportunity Village (09/2016)