Does Interprofessional Education Influence Self-Efficacy and Cultural Competence in Pre-Clinical Doctor of Physical Therapy Students?

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Abstract

Introduction

Interprofessional education (IPE) promotes collaboration among health professionals to combat health disparities. This study explored differences in self-efficacy and cultural competence among a sample of preclinical entry-level Doctor of Physical Therapy (DPT) students based on curriculum format (traditional or IPE) and examined differences in age and gender as related to self-efficacy and cultural competence.

Methods

This cross sectional study design assessed differences in self-reported levels of self-efficacy and cultural competence. 218 entry-level DPT students enrolled in a traditional (n=109) or IPE (n=109) curricula from 6 different universities was used for analysis.

Results

The IPE group (M = 65.2) rated significantly higher in self-efficacy than the traditional group (M = 62.2, \( p = .002 \)). No significant differences \( (p = .103) \) in cultural competence were observed between traditional and IPE curricula; however, relationships between age and gender \( (p = .001) \) were observed.

Discussion

Self-efficacy is a valuable construct in the success of healthcare students and differences between curricula types and self-efficacy scores were identified. Similar cultural competence scores for the groups may indicate the need for specific graduate-level measurement methods.
Conclusions

IPE curricula may increase self-efficacy among DPT students prior to clinical internship and result in better-prepared interprofessional team members.

Keywords: Cultural Competence, Self-efficacy, Interprofessional education

Introduction

Healthcare professionals are challenged with healthcare disparities [Campinha-Bacote, 2002; Hawala-Druy & Hill, 2012; Institute of Medicine (IOM), 2003], as disparities are widening between dominant and minority groups and health care outcomes are declining [Olshansky et al., 2012; World Health Organization (WHO), 2010]. The IOM [2003] has suggested that the development of cross-cultural skills of healthcare providers might be the solution to this problem. The WHO [2010] defines Interprofessional Education (IPE) as "when students from two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes" [p. 13]. The goal of IPE is to provide an education for healthcare providers that will prepare them for working in a collaborative team environment to address the diverse health care needs of society [IOM, 2003; WHO, 2010]. Interprofessional collaboration, IPE, and collaborative teaching practice models are of growing interest as a means of providing cost-effective, quality patient care [Gilbert, 2005; Reeves et al., 2011; Walsh, Reeves, & Maloney, 2014; WHO 2010].

The American Physical Therapy Association (APTA) [2008] created the Blueprint for Cultural Competence Education that was rooted in the Campinha-Bacote Model [Campinha-Bacote, 2002] to address the need for improved cross-cultural skills of healthcare providers. Additionally, the APTA [2008] has acknowledged cultural competence as an important part of physical therapy practice and education. The overarching goal of IPE is to improve client health through the adequate education of a collaborative, practice-ready workforce that is not only attuned to, but also responsive to local health needs [WHO, 2010]. Collaboration supports cultural competence, because it brings together differing perspectives on the best practices for serving a diverse client population [Curran, Sharpe, Forristall, & Flynn, 2008; Gilbert, 2005]. The IOM [2003] postulated that a patient often requires more than one area of expertise. Furthermore, they recommended that healthcare teams might likely be the solution to more effective patient care. Although a promising prospect, such IPE models are not well established in the area of PT education in the United States [Arenson, Rose, & Lyons, 2010; Bridges, Davidson, Odegard, Maki, & Tomkowiak, 2011; Thiele & Barraclough, 2007].

The Interprofessional Collaborative Expert Panel (IPEC) identified self-efficacy and cultural competence as fundamental competencies within the core domains of IPE and collaborative practice [IPEC, 2011; IPEC, 2016]. Campinha-Bacote [2002] defined cultural competence as "the ongoing process in which the health care provider continuously strives to achieve the ability to effectively work within the cultural context of the client (individual, family, community)" [p. 181]. Self-efficacy is a person's belief in their ability to succeed in a life situation [Bandura, 1977].

The ability of a person to change behavior or experience personal mastery has been associated with self-efficacy [Bandura, 1977]. The construct of self-efficacy has been examined in research regarding professional medical education, learning, and success [Goldenberg, Andrusyszyn, & Iwasiw, 2005; Townsend & Scanlan, 2011]. Other reports have explored self-efficacy and patient care outcomes [Dahl & Hall, 2013; Jungert & Rosander, 2010]. Previous research reported ways to increase self-efficacy among healthcare professionals through communication...
training [Norgaard, Ammentorp, Kyvik & Kofoed, 2012] and problem-based learning [Darkwah, Ross, Williams, & Madill, 2011; Jungert & Rosander, 2010].

Further, research supports that changes in self-efficacy [Coogle, Hackett, Owens, Ansello, & Mathews, 2016; Goldenberg et al., 2005; Mann et al., 2012; Townsend & Scanlan, 2011], and cultural competence [Hawala-Druy & Hill, 2012; Jackson, 2011; Oliveira, North, Beck, & Hopp, 2015] happen with participation in IPE activities. A need for culturally competent health care providers exists [IOM, 2003; WHO, 2010]. Knowledge about the differences between traditional and IPE curricula on self-efficacy and cultural competence prior to clinical internship may enhance the future learning and performance on clinical internships, better preparing students for working in a collaborative workplace.

The purpose of this study was to explore differences in self-efficacy and cultural competence for a sample of preclinical entry level Doctor of Physical Therapy (DPT) students based on curriculum format (traditional or IPE). A secondary objective was to examine differences in age and gender in self-efficacy and cultural competence scores.

**Methods**

**Subjects**

All participants were over the age of 18 years and were entry-level DPT students who had not participated in a formalized clinical internship as part of their professional education. Participants represented six different physical therapy programs in the United States. Students who were on a part-time admission status or who had completed a 6-week or longer clinical internship were excluded from the study. Prior to recruitment, an Institutional Review Board (IRB) approved the study protocol.

Data was collected using a sample of 218 Doctor of Physical Therapy (DPT) students from three programs with interprofessional education (IPE) curricula and three programs with traditional curricula. The operational definition for an IPE curriculum for this study was that 25% or more of the physical therapy curriculum included IPE. This was determined by reviewing the website for the program, then confirming the details of the IPE curriculum with the program director. The program director confirmed that the sample of pre-clinical students were exposed to IPE prior to data collection. A traditional curriculum for this study meant that the curriculum did not have any IPE courses or experiences for their students listed on the website, which was then confirmed by the program director from the participating institutions.

**Recruitment**

An invitation e-mail was sent to the program directors from a list of PT education programs provided by the Commission on Accreditation in Physical Therapy Education [Commission on Accreditation in Physical Therapy Education (CAPTE), 2014] that met the criteria of traditional or IPE curricula. Once a program director confirmed interest in participating, the primary researcher had a meeting with them to confirm the curriculum type and review the process for data collection.

**Procedures**

On the day of data collection, participants completed a demographic questionnaire, including gender identity and age. After completion of the demographic questionnaire, participants completed two instruments, the Scherer Self-Efficacy Scale [Scherer et al., 1982] and the Inventory for Assessing the Process of Cultural Competence Among
Healthcare Professionals–Student Version [IAPCC-SV; Camphina-Bacote, 2007]. All of the data was collected anonymously in a face-to-face environment using paper and pencil instruments for participants in both traditional and IPE curricula. The primary investigator did not have any educational relationship with the participants in this study; hence no perceived coercion.

**Sherer Self-Efficacy Instrument**

The Sherer Self-Efficacy Scale is an instrument that operationalizes self-efficacy of students by measuring general confidence level for various activities [Sherer et al., 1982]. The scores on the general self-efficacy subscale were used in the data analysis. Sherer Self-Efficacy Scale reliability scores have been consistently reported with values .78 to .88 [Chen, Gully, & Eden, 2001], .88 [Scherbaum, Cohen-Charash, & Kern, 2006], and .84 [Woodruff & Cashman 1993]. Further, the reported Cronbach's alpha reliability estimates for scores were .84 for the general self-efficacy subscale [Sherer et al., 1982]. This scale includes 30 statements about personal attitudes and traits. The answer format is a 5-point Likert-type response with answer categories of disagree strongly, disagree moderately, neither agree or disagree, agree moderately, or agree strongly. These ratings are scored and summed to produce a general score with range from 17–85, with higher scores indicating a higher level of self-efficacy.

**IAPCC-SV Instrument**

The Inventory for Assessing the Process of Cultural Competence Among Healthcare Professionals–Student Version (IAPCC-SV) [Camphina-Bacote, 2007] measures cultural competence. The scores for the IAPCC-SV instrument were calculated by taking the sum of the 20 items that cover the cultural constructs of desire, awareness, knowledge, skill, and encounters [Camphina-Bacote, 2011]. The reported Cronbach's alphas for IAPCC-SV scores have been largely consistent, with values such as .79 [Wilson, 2011], .75 [Okere, Gleeson, Melzer, Olson, & Mitchell, 2011], .84 [Young, 2009], and .86 [Fike, Denton, Esparza, & Palombaro, 2016]. For this study, participants were classified as culturally incompetent/aware or culturally competent/proficient based on the cutoff score of 60. The answer format is a 4-point Likert-type item responses with categories of strongly agree, agree, disagree, and strongly disagree. The total scores range from 20–80, and based on the total score for the instrument the student is categorized at the level of cultural proficiency (highest level), cultural competence, cultural awareness, or cultural incompetence (lowest level).

**Statistical Analysis**

Descriptive statistics were used to describe the participant demographic characteristics. A Mann-Whitney test was used to analyze differences in levels of self-efficacy and cultural competence of traditional and IPE curricula groups [Mann & Whitney, 1947; McKnight & Najab, 2010]. Cultural competence scores for traditional and IPE groups were assessed using a 2x2 design and chi-square analysis. The cultural competence ratings were split into two groups, rating those with scores ≥60 as culturally competent/proficient and those with scores <60 as culturally aware/incompetent. Additionally, the prevalence of responses for questions 4, 7, 19 on the IAPCC-SV were reported. A correlation analysis was conducted to examine the relationships between gender and age to the composite scores on the Sherer Self-Efficacy Scale [Scherer et al., 1982] and IAPCC-SV [Camphina-Bacote, 2007].

Estimates of reliability were calculated for the self-efficacy and cultural competence scales. The interpretation of the ICCs followed guidelines suggested by Baumgartner, Jackson, Mahar, & Rowe [1999] where coefficients exceeding 0.80 suggest good reliability, coefficients between 0.60 and 0.79 suggest moderate reliability, and coefficients below 0.60 suggest poor reliability. The Statistical Package for the Social Sciences (SPSS version 21) was used (SPSS Inc., Chicago, Illinois) for all analyses.
Results

A total of 218 entry-level DPT students (64 male/152 female/2 missing) participated in this study. Participants represented 6 programs from 3 different states. There was an equal number of participants from the traditional programs (n=109) and interprofessional education programs (n=109). There was a significant difference in mean age by gender \((p = .001)\), with the mean age of 24.9 years for males and 23.7 years for females (Table 1). No significant differences between men and women in ratings of self-efficacy \((p = 0.59)\) or cultural competence \((p = 0.42)\) were observed.

Using the Mann-Whitney test, only self-efficacy had any significant results in the between-subjects analysis \((U = 4509, p = .002, r = -0.21)\). In the post hoc analysis of self-efficacy results, those in the interprofessional education (IPE) group had a significantly higher mean rank of 122.6 when compared to the traditional group with a mean rank of 96.4. Those in the IPE group \((M = 65.2)\) rated significantly higher on the measure of self-efficacy when compared to the traditional group \((M = 62.2)\). Cultural competence results suggest no significant difference between the mean rank of 116.46 for the interprofessional education (IPE) group and the mean rank of 102.54 for the traditional education group \((U = 5182, p = .103, r = -0.09)\). Table 2 displays these results.

Within the traditional group, 52.3\% \((n=57)\) of participants had total scores ≥60 and 47.7\% \((n=52)\) of participants rated had total scores <60. Within the IPE group, 60.6\% \((n=66)\) of participants had total scores ≥60 and 39.4\% \((n=43)\) of participants rated had total scores <60. With \(p = .22\), there was no significant difference between traditional and IPE curricula within scores of cultural competence. The lowest mean scores of selected individual questions were for questions 4 \((x^- = 2.06)\), 7 \((x^- = 2.44)\), and 19 \((x^- = 2.45)\) on the IAPCC-SV, corresponding, respectively, to the Cultural Knowledge, Cultural Skill, and Cultural Encounters subscales. The remaining 17 items had a mean range of scores of \(x^- = 2.73\) to \(x^- = 3.72\) (Figures 1 and 2).

Discussion

Population

In this study, more females (69.7\%) were represented in the sample than males (29.4\%); however, this is consistent with the reported average of 62\% female enrollment average within 2015-2016 physical therapy programs [CAPTE, 2016]. Similar to previous research, no significant differences were observed between genders in ratings of self-efficacy [Ateah et al. 2011] or cultural competence.

Self-Efficacy

Participants in the IPE curriculum scored higher on average in ratings of self-efficacy as compared to those within traditional curricula. This finding is consistent with previous studies reporting a positive association between a collaborative health professional student settings and self-efficacy [Mann et al., 2012] and that interprofessional learning had a positive impact on self-esteem and resulted in confidence and pride when communicating with the team [Davies et al., 2011].

Self-efficacy is a valuable construct that often contributes to student success in an academic environment [Peterson, 2015]. Furthermore, the demand for social interaction between members of the medical team requires a clinician to demonstrate a strong sense of self-efficacy. This makes self-efficacy an important focal point in promoting interprofessional collaboration and care for diverse groups of patients, including physical therapy students of whom
little research regarding this subject has been done. This study indeed suggests that there may be differences between curricula types and ratings of self-efficacy. The significantly higher self-efficacy scores among this sample of interprofessional curricular students suggests that this curricular content may impact DPT students’ reported self-efficacy.

**Cultural competence**

**High overall scores**

The mean score for the IAPCC-SV was high ($\bar{x} = 61.0$), yet is consistent with previous reports in dental hygiene students [Daugherty-Wood, 2015] and DPT students [Black, Palombo, Dole, & Guay, 2015]. This finding and its implications on the self-perceived preparedness for DPT students before going to the clinic should be interpreted cautiously. (Figure 1). The frequency of participants ranking in the cultural incompetence (scores 20-40) was low (n=2) and is consistent with another study of health professions students in which no one rated culturally incompetent [Daugherty-Wood, 2015]. In fact, in a sample of 78 DPT students, everyone rated culturally aware to culturally proficient during their pre-test; no participants were rated culturally unaware [Black et al., 2015]. Similarly, in a study of 27 undergraduate dental hygiene students everyone rated culturally aware and above [Daugherty-Wood, 2015].

The elevated scores on the IAPCC-SV may be explained by the year in which the instrument was developed [2007] or that it was originally validated with undergraduate medical students [Campinha-Bacote, 2007], this may contribute to higher scores among graduate students. Another possible limitation of using the IPACC_SV for this study is that the instrument was validated in 2007, and this scale may not account for the increase in globalization of society and ease of access of diverse cultures. Further, research suggests the need for reliable and validated IPE-specific measures as well [Lutfiyya, Brandt, & Frank, 2016]. This indicates the need for reconsideration of the population of interest, including graduate-level coursework, real-world experiences, and IPE curricula when assessing learning experiences and cultural competence.

In fact, one study posited that depending on the population of interest, the minimal detectable change (MDC) values may differ [Fike et al., 2016]. This occurred when comparing the DPT and Athletic Training and Rehabilitation Science students in their sample. A limitation is that the MDC for the IAPCC-SV is 8.57 for Doctor of Physical Therapy students [Black et al., 2015], making those with the highest pre-test scores unable to meet the MDC. Further, dichotomizing the cultural competence scores may pose a limitation as this may ignore individual differences and can impact the psychometric properties of the measure [MacCallum, Zhang, Preacher, & Rucker, 2002]. The dichotomized variable was used in this study to highlight the difference between those with total scores $\geq 60$ (culturally competent/proficient) as considered more able to provide culturally competent healthcare whereas those with total scores <60 (culturally aware/incompetent) would not be considered to meet the scale total score indicating the ability to provide culturally competent healthcare. Though those who scored near 60 may not be as significantly different from each other as those with extreme high and low scores, the dichotomized variable provides an indicator of acceptable levels of cultural competence applicable in providing healthcare.

**Low mean scores**

A documented concern with the scale is that some content of the questions may not be understood without a formal class or the questionable ability of a 4-point Likert-type scale with 20 questions capturing applicable cultural competency levels [Gallagher, 2011]. In this study, the three questions (4, 17, 19) on the IAPCC-SV instrument had the lowest mean scores of 2.06, 2.44, and 2.45, respectively, among the sample for this study. In order, these questions belong to the Cultural Knowledge, Cultural Skills, and Cultural Encounters subscales.
The lack of discernable relationship between the IAPCC-SV scores in participants in the IPE and traditional curricula may be explained by the potential for self-inflation. A previous report identified that self-report error may exist, favoring one’s own cultural competence skills within the IAPCC-SV [Gallagher, 2011]. Further, the IAPCC-SV may be focused on attitudes and, "...it is unclear as to whether attitudes may or may not result in culturally competent behavior," [Gallagher, 2011, p. 41]. For this reason, there has been suggestion to use another measure in conjunction with the IAPCC-SV, such as the Transcultural Self-Efficacy Tool, may provide a more complete gauge of cultural competence [Gallagher, 2011], especially application of cultural competency skills among diverse patient populations [Fitzgerald et al., 2009]. A positive association between cultural competence education and students self-reported self-efficacy has been reported in undergraduate nursing students [Jeffreys & Dogan, 2012]; however, this study is the first to compare entry level DPT students between a traditional versus IPE curriculum prior to clinical internship.

This study has some limitations. The self-reported nature of the Sherer Self-efficacy and IAPCC-SV instruments may result in over-estimating one’s level of self-efficacy and cultural competence. The cross sectional design limited the ability to follow the participants over time; hence, a causal pathway could not be established. Also, the study was limited to entry-level DPT students which limits the generalizability to other health professions.

**Conclusion**

In this study of entry level (DPT) students prior to clinical internship, students within the IPE curricula reported significantly higher levels of self-efficacy as compared to DPT students enrolled in a traditional curriculum. There was no significant difference in levels of cultural competence between groups. Also, no observable differences exist between age and gender for self-efficacy and cultural competence. Therefore, applying the knowledge that self-efficacy and cultural competence may best be developed prior to clinical internships may be beneficial to DPT students as they prepare to treat a diverse patient population. Future cultural competency research should also include the use of additional measures of competence, in particular a graduate-level and interprofessional education-specific measure of self-efficacy and cultural competence.

**Tables and Figures**

| Table 1  |
|----------|

| Gender, n (%) | Mean Age (Years) | SE Mean | CC Mean |
|--------------|------------------|---------|---------|
| Male         | 64 (29.4)        | 24.9    | 65.1    | 62.2    |
| Female       | 152 (69.7)       | 23.7    | 63.2    | 60.5    |
| Missing      | 2 (0.9)          | 23.5    |         |         |
| Total        | 100.0% (n=218)   | 24.01   | 63.7    | 61.0    |

*Note. There was a significant difference between males and females in mean age (p = .001). There were no significant differences between males and females on scores of self-efficacy (p = .59) or cultural competence (p = .42). SE=self-efficacy; CC=Cultural Competence*
Table 2
Tests of Between-Subjects Effects (n=218)

| Variable        | Traditional Education Mean Rank (n = 109) | Interprofessional Education Mean Rank (n = 109) | U   | r   | p   |
|-----------------|------------------------------------------|-----------------------------------------------|-----|-----|-----|
| Self-efficacy   | 122.63                                   | 96.37                                         | 450 | -0.21 | .00 |
| Cultural Competence | 102.54                                  | 116.46                                        | 518 | -0.09 | .10 |

Note. $U =$ U-statistic, $r =$ Effect size
Figure 1

*Histograms showing distributions for self-efficacy scores*

![Histograms showing distributions for self-efficacy scores](image)
Take Home Messages

- Interprofessional education may influence doctoral physical therapy students’ pre-clinical levels of reported self-efficacy.
- A need for graduate-level measures of health professions students’ cultural competence exists.

Notes On Contributors

Dr. Laura Smith is an Assistant Professor in the Physical Therapy Department and Director of the Orthopedic Residency Program at the University of Michigan-Flint. Her research interests are in interprofessional education, interprofessional collaborative practice, and injury reduction and performance measures.

Morgan Perry is an MPH candidate at the University of Michigan-Flint. She works primarily with diverse population health care needs, professional contracting and networking. Her research interests lie in social determinants of health, including implications on health disparities, literacy, and care access.

Dr. Amy Yorke is an Assistant Professor in the Physical Therapy Department at the University of Michigan-Flint.
Her research interests are in teaching and learning in physical therapy education, concussion, and influences on physical measures in population based surveys.

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Appendices

Declaration of Interest

The author has declared that there are no conflicts of interest.