

An Exploration of Doctor of Physical Therapy Students' Belongingness in Clinical Education: A Validation Study

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Introduction. The aim of this study was to adapt and validate the Belongingness Scale-Clinical Placement Experience (BES-CPE) for Doctor of Physical Therapy (DPT) students in the United States.

Review of Literature. Belongingness is vital to one's mental, emotional, and physical health. Research has shown that belongingness

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The study received ethical approval from the Duke University Health System's Institutional Review Board (Pro00107965). The study also received approval from Institutional Review Boards at the Northern Illinois University (Protocol #HS21-0416) and the Thomas Jefferson University (45 CFR 46.101 (2-survey) Control #21E.461). The study complies with the Declaration of Helsinki.

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is positively correlated with students' academic performance and achievement. An absence of belongingness may hinder students' full participation in clinical experiences and compromise clinical achievement.

Subjects. Respondents were current or former DPT students at least 18 years of age who had either completed the midterm evaluation of their final terminal full-time clinical education experience (TCE) in their DPT program or were no more than 1 year from the completion of their final TCE.

Methods. The BES-CPE was adapted for DPT students, and the scale was completed electronically by those who met the inclusion criteria. Principal component analysis with promax rotation and Cronbach's α were used to determine construct validity and reliability.

Results. One hundred fifty-nine respondents completed all items on the BES-CPE and demographic survey. A 3-component structure was identified (esteem, connectedness, and efficacy), which was aligned to the original BES-CPE scale. One item was discarded, and the final version of the BES-CPE for DPT students is a 33-item scale with satisfactory internal consistency.

Discussion and Conclusion. This study adapted and provided evidence for validity of the first known scale to measure belongingness in DPT students during their clinical education experiences (CEEs) in the United States. The 33-item BES-CPE provided valid and reliable measures of belongingness in DPT students during CEEs that can be used to provide a better understanding of the student experience in the clinical learning environment.

Key Words: Students, Doctor of Physical Therapy, Belongingness Scale-Clinical Placement Experience, Belongingness, Clinical, Scale.

INTRODUCTION

There is an increased emphasis on the importance of "belongingness" as a key construct when considering the success and engagement of students in a learning environment.

Exploration of student success and the student experience in physical therapy education has received more attention in the literature in the past several years.^{1,2} The profession's American Council of Academic Physical Therapy recently established a task force to find mechanisms to ensure that students and faculty from historically marginalized and excluded racial and ethnic groups in physical therapy experience a sense of belonging.³

Physical therapist education is mainly described as didactic education and clinical experiential learning. In physical therapist education, nearly 30% of a student's time in a Doctor of Physical Therapy (DPT) program is spent in clinical education experiences (CEEs).⁴ These experiences are a core component for DPT students because they provide students with opportunities to solidify didactic content, apply knowledge and skills, and develop clinical reasoning and decision making in the clinical care of patients. Evidence shows that a student's motivation to learn, to be academically successful, and to have a healthy sense of well-being is heavily influenced by belongingness in the clinical learning environment.⁵⁻¹⁰

The construct of belongingness is one of the foundational layers for individuals to truly feel engaged and connected to their learning in meaningful ways, which inherently leads to better learning, better academic outcomes, and better care in clinical settings.^{1,5,6,8-11}

When professional education culminates in clinical experiences, students leave the familiarity of the classroom environment, and often their support system, as they enter an unfamiliar clinical learning environment. This can often foster isolation, diminished self-esteem, and a lack of belongingness.^{6,12} Maslow's hierarchical theory states that a student must satisfy lower-level needs, such as belonging and self-esteem, before progressing to higher-level needs, such as cognition.^{13,14} Those who feel they belong are more likely to acknowledge the value of mandatory work and have higher self-belief in their chances to succeed.¹⁵⁻²⁰ Individuals who are deprived of belongingness, experience diminished self-esteem, increased stress, anxiety, depression, and a decrease in general well-being and happiness.⁶ Therefore, a student's capacity to learn in a clinical environment is directly

influenced by the extent to which they experience belongingness.

The Belongingness Scale-Clinical Placement Experience (BES-CPE) was developed and validated for undergraduate-level nursing clinical education as an objective measure of belongingness during clinical placements.^{21,22} This same instrument was adapted and validated for use with medical students in the clinical environment.²³ Both versions of the BES-CPE demonstrated strong psychometric properties.^{22,23} Because belongingness has a significant impact on one's ability to reach their full potential, such an instrument will prove invaluable to understand the CEEs of DPT students. To date, no instrument exists in physical therapy clinical education. Therefore, the aim of our quantitative study was to adapt and validate a version of the BES-CPE for DPT students that would provide adequate measurement properties for student belongingness during CEEs.

REVIEW OF LITERATURE

The literature has multiple definitions of belongingness, which overlap considerably in their core tenets. According to Maslow, the construct of belongingness encompasses the human need to be accepted, recognized, valued, and appreciated by others.²⁴ Others have described it as the need to be and perception of being involved with others at differing interpersonal levels, leading to feeling connectedness and esteem.^{21,25} This can occur simultaneously to individuals providing reciprocal acceptance, caring, and valuing to others.^{21,25} Most recently, Vivekananda-Schmidt and Sandars⁷ inferred that belongingness is an individual's sense of connection to or acceptance from others, established by an interaction between an individual and their surrounding environment. Levett-Jones and Lathlean⁵ defined belongingness as "a deeply personal and contextually mediated experience that evolves in response to the degree to which an individual feels (a) secure, accepted, included, valued, and respected by a defined group, (b) connected with or integral to the group, and (c) that their professional and/or personal values are in harmony with those of the group." Interestingly, this may evolve passively in response to the actions of the group to which one aspires to belong and/or actively through the actions initiated by the individual.⁵ To better serve DPT students' personal and professional growth, an examination of the manner in which belongingness manifests in the classroom and during CEEs is essential.

There is growing evidence on the importance of belongingness in health professions education, and it can be experienced differently in the clinical environment compared with the classroom.^{5,7,26} Most of the research on belongingness in the clinical education environment has been studied in nursing education. Levett-Jones et al²² developed and evaluated the

psychometric properties of the BES-CPE to better understand the experiences of nursing students on clinical placements at 2 Australian universities and 1 English university. The BES-CPE was adapted from Somers' Belongingness Scale,²¹ which was developed in the United States and was based on the theoretical framework of Baumeister and Leary²⁵ who provided evidence for belongingness as fundamental for human motivation. Somers' Belongingness Scale²¹ examined content relevance and representativeness of the construct using feedback from an expert panel of judges followed by a focus group to whom the scale was administered. The subscale from Somers' Belongingness Scale that was used for the development of the BES-CPE was reliable with high internal consistency ($\alpha = .94$).^{21,22} The BES-CPE developed by Levett-Jones et al assesses feelings, cognition, and behaviors. It contains 34 items that are scored on a 5-point Likert scale (1 = never true, 2 = rarely true, 3 = sometimes true, 4 = often true, 5 = always true). Items are both positively and negatively worded to prevent response bias; the 4 negatively worded items are reverse scored such that higher scores on the BES-CPE indicate a higher level of belongingness. Total scores on the BES-CPE range from a minimum of 34 (low belongingness) to a maximum of 170 (high belongingness). Principal component analysis (PCA) of the original BES-CPE yielded 3 components: esteem, connectedness, and efficacy.²² Esteem refers to feeling secure, included, valued, and respected by others in the group. Connectedness refers to being accepted and feeling part of a group. Efficacy refers to behaviors undertaken to enhance one's experience of belongingness in the group. The reliability of the original BES-CPE by Levett-Jones et al²² was assessed through internal consistency and test-retest reliability measurement. Acceptable values of Cronbach's α range from 0.70 to 0.95.²⁷ Levett-Jones et al²² first conducted a pilot study with a smaller sample at 1 private institution to ensure reliability and validity of the BES-CPE ($\alpha = 0.90$). They followed up with further testing in a larger sample at 3 institutions, which revealed high internal consistency reliability ($\alpha = 0.92$).²² Construct validity was assessed using principle component analysis with varimax rotation.²² Since the study by Levett-Jones et al, the original BES-CPE has been translated and validated for nursing students across the globe in several different languages and countries, including the United States.²⁸⁻³¹ Furthermore, it was determined that the original BES-CPE had "potential for replication studies with different contexts and cohorts."²²

The original BES-CPE has since been adapted and validated for use with medical students. The BES-CPE for medical students underwent a face validity assessment by a panel of judges with experience in medical curricula resulting in the

revision of 12 items and the removal of 1 item.²³ It demonstrated satisfactory internal consistency ($\alpha = 0.86$) and produced the same 3 components of the original BES-CPE: esteem, connectedness, and efficacy.²³

The BES-CPE has become the most widely used instrument to measure belongingness in health professions education.⁷ However, there is no current instrument to measure belongingness in physical therapy clinical education. The aim of this quantitative study is to validate an adapted version of the BES-CPE for DPT students in the United States.

SUBJECTS

For inclusion in the study, respondents attested to being at least 18 years of age, completing the midterm evaluation of their final terminal full-time clinical education experience (TCE) in their DPT program, and being no more than 1 year from completion of their final TCE. Similar to the validation study for the original BES-CPE,²² these time parameters were chosen because students in their final experience were viewed as the best source for reporting on belongingness during CEEs, as they had completed a range of clinical experiences and to best ensure the respondent's ability to recall their experiences during the recall their experiences during the TCE. Subjects were recruited through an email sent directly to DPT students and alumni at 2 private institutions and 1 public institution. In addition, subjects were also recruited through email distribution lists by means of the American Physical Therapy Association, specifically the Academy of Physical Therapy Education and the Student Core Ambassador program. All respondents consented and completed the survey through QualtricsXM Survey platform (Qualtrics, Provo, UT).

METHODS

The study received ethical approval from the Institutional Review Board at the Duke University Health System. The study also received approval from Institutional Review Boards at the Northern Illinois University and the Thomas Jefferson University. The original BES-CPE was adapted by the researchers with permission granted by Levett-Jones et al. The face validity and content relevance of the BES-CPE were assessed by a panel of 5 faculty members currently working in health professions' education programs, all of whom also have experience in DPT clinical education. Adaptations to the original scale were agreed upon by the panel and made to be consistent with nomenclature specific to and typically used within the physical therapy profession and within entry-level physical therapist education programs. For instance, the term "placements" was modified to "clinical experiences" to reflect common

Table 1. BES-CPE Adapted Item Descriptions

Items	Original BES-CPE	Adapted BES-CPE for DPT Students
1	I feel like I fit in with other people during my placements	I feel like I fit in with others during my clinical experience(s)
3	Colleagues see me as a competent person	Colleagues perceive me to be a competent person
6	I view my placements as a place to experience a sense of belonging	I view my clinical experience(s) as a place to experience a sense of belonging
8	I am invited to social events outside of my placements by colleagues	I am invited to social events outside of my clinical experience(s) by colleagues
9	I like the people I work with on placements	I like the people I work with on my clinical experience(s)
10r	I feel discriminated against on placements	I feel discriminated against on my clinical experience(s)
12	It is important to me that someone at my placement acknowledges my birthday in some way	It is important to me that someone at my clinical experience(s) acknowledges personal events/milestones in some way
13	I invite colleagues to eat lunch/dinner with me	I invite colleagues to eat meals with me
14r	On placements I feel like an outsider	On my clinical experience(s) I feel like an outsider
15	There are people that I work with on placements who share my values	There are people that I work with on my clinical experience(s) who share my values
16	Colleagues ask for my ideas or opinions about different matters	Colleagues ask for my ideas or opinions about different matters (either professional or personal)
18	I make an effort when on placements to be involved with my colleagues in some way	I make an effort when on my clinical experience(s) to be involved with my colleagues in some way
21	People I work with on placements accept me when I'm just being myself	People I work with on my clinical experience(s) accept me when I'm just being myself
22r	I am uncomfortable attending social functions on placements because I feel like I don't belong	I am uncomfortable attending social functions on my clinical experience(s) because I feel like I don't belong
23	When I walk up to a group on a placement I feel welcomed	When I walk up to a group on my clinical experience(s) I feel welcomed
24	Feeling "a part of things" is one of the things I like about going to placements	Feeling "a part of things" is one of the things I like about my clinical experience(s)
25	There are people on placements with whom I have a strong bond	There are people at my clinical experience(s) with whom I have a strong bond
26	I keep my personal life to myself when I'm on placements	I keep my personal life to myself when I'm on my clinical experience(s)
27	It seems that people I work with on placements like me	I think that the people I work with on my clinical experience(s) like me
29	Colleagues notice when I am absent from placements or social gatherings because they ask about me	Colleagues notice when I am absent from my clinical experience(s) or social gatherings because they ask about me
33	I like where I work on placements	I like where I work on my clinical experience(s)

Abbreviations: BES-CPE = Belongingness Scale-Clinical Placement Experience; DPT = Doctor of Physical Therapy.

language used in physical therapy clinical education.³² Other items were modified to contain more inclusive language, such as replacing "birthday" with "personal events/milestones" and replacing "lunch/dinner" with "meals" to reflect diverse customs and communities. Some items were consistent with the revisions made in the BES-CPE for medical students.²³ No items were removed from the scale. Table 1 provides the complete list of revisions. Three terms were operationally defined in the scale for the respondents. Sense of belonging was defined consistent with the definition of belongingness that emerged in the development of the original BES-CPE.^{6,22} Colleagues was defined as "clinical

instructor, staff, and other students at the clinical site." Work was defined as "any tasks or activities performed as part of the clinical experience."

The Statistical Package for the Social Sciences version 24 was used for data analysis. Principal component analysis (PCA) with promax rotation was used to determine the construct validity. Sampling adequacy and sphericity were tested by means of the Kaiser–Meyer–Olkin test and Bartlett's test, respectively. These statistical measures were identical to those used when adapting the original scale for medical students.²³ Cronbach's α was used to determine the internal consistency reliability of the BES-CPE, which is the same statistical measure used in both the original study

and the adapted version for medical students.^{22,23} Also included in the analysis were mean BES-CPE scores with standard deviation by student demographics as well as item mean and standard deviation for all BES-CPE scores.

RESULTS

A total of 245 respondents started the survey and 159 completed items on the BES-CPE scale. Data were included and analyzed for the 159 students who answered all the BES-CPE items. Demographic characteristics of the study sample and corresponding mean BES-CPE scores with standard deviation are shown in Table 2. Overall,

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Table 2. Overall BES-CPE Scores by Student Demographics (n = 159)^a

	Number of Students (%)	Overall BES-CPE Score Mean (SD)	P value
Gender			0.37
Female	128 (81)	132 (17)	
Male	26 (16)	129 (18)	
Not listed or prefer to self-describe	0 (0)	—	
Prefer not to say	0 (0)	—	
Did not answer	5 (3)	139 (13)	
Sexual orientation			0.004
Straight/heterosexual	139 (87)	133 (16)	
Lesbian	5 (3)	106 (20)	
Gay	0 (0)	—	
Bisexual	9 (6)	126 (16)	
Queer	1 (1)	154 (0)	
Asexual	1 (1)	109 (0)	
Not listed or prefer to self-describe	0 (0)	—	
Prefer not say	2 (1)	134 (19)	
Did not answer	2 (1)	146 (23)	
Race			0.24
American Indian or Native American	0 (0)	—	
Alaska native	0 (0)	—	
Asian or Asian American	6 (4)	136 (14%)	
Black or African American	7 (4)	129 (13)	
Native Hawaiian or Pacific Islander	1 (1)	145 (0)	
White	141 (89)	131 (17)	
Not listed or prefer to self-describe	1 (1)	168 (0)	
Prefer not to say	1 (1)	116 (0)	
Did not answer	2 (1)	119 (30)	
Ethnicity			0.16
Not of Hispanic origin	147 (93)	131 (17)	
Mexican, Mexican American, Chicano/a/x	2 (1)	150 (25)	
Puerto Rican	2 (1)	144 (2)	
Cuban	3 (2)	136 (8)	
Another Hispanic, Latino/a/x, or Spanish origin	4 (3)	145 (30)	
Not listed or prefer to self-describe	0 (0)	—	
Prefer not to say	0 (0)	—	
Did not answer	1 (1)	130	

Abbreviation: BES-CPE = Belongingness Scale-Clinical Placement Experience.

^aNo respondents selected nonbinary, transgender, cisgender, agender, genderqueer as responses. Respondents could select all that apply.

individual BES-CPE scores ranged from 86 to 168, with a mean of 131.6 (SD = 17). Higher scores indicate an increased sense of belongingness.

Tests of factorability suggested the survey data were appropriate for PCA. Appropriate

common variance in the belongingness scale was confirmed by the Kaiser–Meyer–Olkin test (0.92) being above 0.50 and the Bartlett’s test of sphericity (Chi-square₍₅₆₁₎ = 2,976.0, P = .00) being statistically significant.³³

Mean and standard deviations for each item were calculated and compared. A ranking of the items is presented in Table 3. The items with the highest means were from the efficacy component (top 5). The items with the lowest means were from

Table 3. Item Mean and Standard Deviation for Belongingness Scale–Clinical Placement Experience Scores Ranked From Highest to Lowest (N=159; 1 = never true, 2 = rarely true, 3 = sometimes true, 4 = often true, 5 = always true)

Item	Item Description	Mean	SD
2	It is important to feel accepted by my colleagues	4.50	0.60
32	I ask my colleagues for help when I need it	4.47	0.61
5	I make an effort to help new students or staff feel welcome	4.43	0.66
19	I am supportive of my colleagues	4.42	0.61
20	I ask for my colleagues' advice	4.42	0.65
7	I get support from colleagues when I need it	4.21	0.75
4	Colleagues offer to help me when they sense I need it	4.21	0.72
31	I let my colleagues know that I appreciate them	4.14	0.77
3	Colleagues perceive me to be a competent person	4.13	0.63
28	I let colleagues know I care about them by asking how things are going for them and their family	4.12	0.80
33	I like where I work on my clinical experience	4.12	0.86
21	People I work with on my clinical experience accept me when I'm just being myself	4.06	0.74
9	I like the people I work with on my clinical experience	4.04	0.73
6	I view my clinical experience as a place to experience a sense of belonging	4.03	0.96
27	I think that the people I work with on my clinical experience like me	4.01	0.64
1	I feel like I fit in with others during my clinical experience	3.96	0.75
15	There are people that I work with on my clinical experience who share my values	3.95	0.66
11	I offer to help my colleagues, even if they don't ask for it	3.92	0.77
18	I make an effort when on my clinical experience to be involved with my colleagues in some way	3.87	0.82
24	Feeling "a part of things" is one of the things I like about my clinical experience	3.85	0.98
23	When I walk up to a group on my clinical experience I feel welcomed	3.81	0.80
16	Colleagues ask for my ideas or opinions about different matters (either professional or personal)	3.75	0.77
17	I feel understood by my colleagues	3.67	0.79
25	There are people at my clinical experience with whom I have a strong bond	3.67	1.10
29	Colleagues notice when I am absent from my clinical experience or social gatherings because they ask about me	3.60	0.99
12	It is important to me that someone at my clinical experience acknowledges personal events/milestones in some way	3.57	0.98
34	I feel free to share my disappointments with at least one of my colleagues	3.31	1.07
30	One or more of my colleagues confide(s) in me	3.29	1.03
13	I invite colleagues to eat meals with me	2.96	1.05
26r	I keep my personal life to myself when I'm on my clinical experience	2.86	0.90
8	I am invited to social events outside of my clinical experience by colleagues	2.75	1.32
22r	I am uncomfortable attending social functions on my clinical experience because I feel like I don't belong	2.40	1.07
14r	On my clinical experience, I feel like an outsider	2.34	0.95
10r	I feel discriminated against on my clinical experience	1.43	0.66

Abbreviation: r = reverse scored item.

the connectedness and esteem components, with 4 of the lowest 5 being items that required reverse coding due to negative concepts or wording.

Principal component analysis was conducted with promax rotation resulting in 6 components with eigenvalues >1 and explained 61.22% of the

total variance. The initial eigenvalues for components 1 to 6 ranged from 1.084 to 13.015 and the percentage of variance was 38.3%, 6.5%,

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5.6%, 4.2%, 3.4%, and 3.2%, respectively. The solution was challenging to interpret due to several items with poor loadings or cross-loadings on more than 1 component in the pattern matrix. The first 3 components had eigenvalues ≥ 2 , resulting in retaining a 3-component structure explaining 50.1% total variance. Several items loaded onto more than 1 component, which resulted in discussion among collaborators to determine the inclusion or exclusion of the item and where the item should fall on the scale. Content validity was reassessed, and final placements of items in the scale were based on loadings and agreement among researchers on differences in clinical environments and training for DPT students compared with students from other health professions in which the instrument was used. The results have some items under different components than the original scale by Levett-Jones et al²² and the version adapted for medical students.²³

The final version of the BES-CPE for physical therapy students is a 33-item scale with a 3-component structure that demonstrates satisfactory internal consistency ($\alpha = 0.93$). Table 4 presents the rotated pattern matrix for the items. The component names were retained, and each had satisfactory reliability estimates (esteem—11 items, $\alpha = 0.81$; connectedness—13 items, $\alpha = 0.89$; efficacy—9 items, $\alpha = 0.84$).

DISCUSSION

This study provided evidence for the validity of an adapted version of the BES-CPE for DPT students in the United States. The BES-CPE for DPT students has several implications for physical therapy practice. In a recent scoping review, it was shown that belongingness in undergraduate health professions education is linked to identity formation, student performance, and mental health.⁷ It recommended that more validated instruments be developed to measure belongingness in health professions education, especially during CEEs.⁷ Currently, there are only 2 validated instruments to measure belongingness in clinical education, the original BES-CPE for nursing students²² and an adapted version of the BES-CPE for medical students.²³ These 2 belongingness scales were validated outside the United States; therefore, the BES-CPE for DPT students is the first known validated scale to measure belongingness in physical therapy CEEs in the United States.

The BES-CPE for DPT students was found to be reliable with high internal consistency ($\alpha = 0.93$). This value was similar to the original version for nursing students ($\alpha = 0.92$) and higher than the version adapted for medical students ($\alpha = 0.86$).^{22,23} The 3 components also had acceptable internal

consistency ranging from α of 0.81 to 0.89, which aligned with the original BES-CPE where component α ranged from 0.80 to 0.90.²² Therefore, the results of this study are compatible with previous studies and indicative of high reliability of the BES-CPE for DPT students.

Among the items on the scale, item 2 (*It is important to feel accepted by my colleagues*) had the highest mean score (4.50). This is consistent with the original BES-CPE where item 2 had a mean score of 4.56²² as well as other versions where item 2 also scored highest.^{29,30} Notably, the 5 items with the highest ranked mean scores were consistent among the nursing students and the DPT students (items 2, 5, 29, 20, 32). However, items that ranked lowest differed among the health professions. Item 10 (*I feel discriminated against on my clinical experience*) had the lowest mean score for DPT students, and item 12 (*It is important to me that someone at my placement acknowledges my birthday in some way*) ranked lowest for nursing students in the original study.²² Item 10 referring to discrimination was deleted in the Korean version of the BES-CPE.³⁰ Participants interpreted belongingness and discrimination as separate entities, and there are few cases of discrimination against ethnicity in Korea; therefore, the question was not relevant to the Korean clinical environment.³⁰ Item 10 is likely relevant for DPT students, but the underrepresentation of diverse ethnicities and races in this study may have contributed to the low mean score for this item in DPT students. Concordant with the nursing literature, the lowest scoring items in this study were social or personal in nature, such as item 8 (*I am invited to social events outside of my clinical experience by colleagues*) and item 26 (*I keep my personal life to myself when I'm on my clinical experience*). Students have expressed that they often feel like a guest in the clinic without the authority to make decisions for themselves, which could explain the low scores.³⁴ Furthermore, length of CEEs are known to impact belongingness.⁵ The limited duration of CEEs may cause students to minimize the intersection of their professional and personal identities additionally explaining the lower scores on these items.

The BES-CPE for DPT students yielded the same 3 components (esteem, connectedness, and efficacy) as the original scale from the nursing literature and the adapted scale for medical students.^{22,23} The connectedness component consisted of 13 items, and the esteem and efficacy components consisted of 11 items and 9 items, respectively; this was similar to the adapted version for medical students where the connectedness component contained a greater number of items (12 items)

and the efficacy component contained the smallest number of items (8 items).²³ Like prior studies, some items cross-loaded onto more than 1 component. When cross-loading occurred, the study team discussed the items and achieved consensus on whether to retain the highest loading component, remove the item, or include the item in a specific component based on empirical evidence. One item (*I view my clinical experience as a place to experience a sense of belonging*) was removed from the final BES-CPE for DPT students to avoid a potentially biased response given the use of the word “belonging” in the statement. This was similar to the nursing literature where this item was the only item that loaded onto all 3 components.²² In addition, several items in this study loaded differently from previously validated versions of the scale. For instance, 1 item (*I let colleagues know I care about them by asking how things are going for them and their family*) loaded into the efficacy component in DPT students, the connectedness component in nursing students, and the esteem component in medical students. This could be due to variations in program-specific education cultures across the various health professions resulting in different experiences in the clinical learning environment.³⁵ This variation further demonstrates the necessity for a validated instrument to measure belongingness specific to DPT students. The BES-CPE for DPT students yields valid and reliable scores, providing a new scale that can quantify belongingness during CEEs.

LIMITATIONS

There are a few limitations to consider regarding the results of this study. The respondents in this study were primarily based in private DPT institutions (77%) versus public (23%), which may have resulted in different responses. Due to the low response rate from public and minority-serving colleges and universities, the results cannot confirm if belongingness in each of the 3 components would be similar or different. Lengths of the TCE varied from 4 weeks to 36 weeks, and the current literature suggests that the length of time for a CEE is a factor in developing belongingness.⁵ Another limitation is that students in this study only reported on belongingness in their final TCE. Students in their final experience were perceived by the researchers to be the best source for obtaining information about belongingness during the clinical experience because they had undertaken a range of clinical experiences. It was also important in the context of this study to select 1 consistent time frame for the purpose of validation; however, it is possible that measures of belongingness could be different for early versus later clinical experiences. Despite this, prior research has

Table 4. Belongingness Scale-Clinical Placement Experience Rotated Pattern Matrix^a

Item	Item Description	Esteem	Connectedness	Efficacy
30	One or more of my colleagues confide(s) in me	0.854		
13	I invite colleagues to eat meals with me	0.841		
34	I feel free to share my disappointments with at least one of my colleagues	0.717		
8	I am invited to social events outside of my clinical experience by colleagues	0.693		
25	There are people at my clinical experience with whom I have a strong bond	0.528		
26r	I keep my personal life to myself when I'm on my clinical experience	0.436		
29	Colleagues notice when I am absent from my clinical experience or social gatherings because they ask about me	0.413		
16	Colleagues ask for my ideas or opinions about different matters (either professional or personal)	0.386		
17	I feel understood by my colleagues	0.338		
22r	I am uncomfortable attending social functions on my clinical experience because I feel like I don't belong	0.308		
24	Feeling "a part of things" is one of the things I like about my clinical experience	0.334		
10r	I feel discriminated against on my clinical experience		0.921	
9	I like the people I work with on my clinical experience		0.758	
7	I get support from colleagues when I need it		0.722	
1	I feel like I fit in with others during my clinical experience		0.683	
14r	On my clinical experience, I feel like an outsider		0.675	
4	Colleagues offer to help me when they sense I need it		0.654	
23	When I walk up to a group on my clinical experience I feel welcomed		0.646	
3	Colleagues perceive me to be a competent person		0.624	
33	I like where I work on my clinical experience		0.614	
27	I think that the people I work with on my clinical experience like me		0.591	
21	People I work with on my clinical experience accept me when I'm just being myself		0.562	
15	There are people that I work with on my clinical experience who share my values		0.505	
12	It is important to me that someone at my clinical experience acknowledges personal events/milestones in some way		-0.451	
2	It is important to feel accepted by my colleagues			0.909
31	I let my colleagues know that I appreciate them			0.598
20	I ask for my colleagues' advice			0.592
28	I let colleagues know I care about them by asking how things are going for them and their family			0.584
32	I ask my colleagues for help when I need it			0.536
11	I offer to help my colleagues, even if they don't ask for it			0.496
5	I make an effort to help new students or staff feel welcome			0.468
19	I am supportive of my colleagues			0.394
18	I make an effort when on my clinical experience to be involved with my colleagues in some way			0.343
6 ^b	I view my clinical experience as a place to experience a sense of belonging	0.359		0.305

Abbreviation: r = reverse scored item.

^aRevised and adapted for Doctor of Physical Therapy students.

^bItem was not included in the 3-component scale.

confirmed that the BES-CPE has the capacity to discriminate between respondents and groups.²² A secondary aim of this study was to measure and compare the extent to which DPT students experience belongingness related to their clinical placements and sociocultural identities. Given the homogeneity of the respondents, there was not sufficient data to compare belongingness between students of diverse sociocultural identities. Despite these limitations, the BES-CPE has shown evidence for validity and reliability to quantify belongingness across health professions globally.^{22,23,28,29,36}

Future research should consider surveying DPT students after each clinical experience to determine whether belongingness changes or remains the same over time as students progress through their clinical experiences. Students completing their first full-time CEE may have different perceptions of belongingness compared with students completing their intermediate or final TCE given the different levels of knowledge and skills acquired to navigate the experience. Future research should expand to specifically target a wider sample of DPT students, such as those from minority-serving institutions and those with diverse sociocultural identities. These data can help determine similarities and/or differences in belongingness among students from diverse sociocultural backgrounds. Furthermore, it would be beneficial to collect more data to determine whether belongingness is affected by regional culture, clinical practice setting, or length of the clinical experience. The results from this study may better inform clinical sites and academic institutions as they develop initiatives to facilitate learning environments that foster belongingness.

CONCLUSION

This study adapted and provided evidence for the validity of the first known scale to measure belongingness in DPT students during their CEEs in the United States. The 33-item BES-CPE for DPT students showed evidence for validity and reliability as an instrument that can be used to quantify student belongingness and provide a better understanding of the student experience in their clinical learning environment. Belongingness has a significant impact on a learner's identity formation, engagement, perceived competence, self-confidence, health, well-being, and academic success.^{1,5,7-10,22} Therefore, having an instrument that measures the construct of belongingness will be essential in improving the landscape of the clinical education learning environment and the overall student experience.

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