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Emotional Intelligence as a Predictor for Clinical Performance in Professional Physical Therapy Students

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ABSTRACT

Background and Purpose. The purpose of the admission process in the graduate physical therapy (PT) program is to evaluate information that can predict an individual's potential for success in the program. To date there is no reliable way to predict clinical performance of physical therapy students. Emotional intelligence has been shown to predict clinical performance in other medical professions and may be a predictor for clinical performance in PT. Generic abilities of clinical performance are critically important in the PT profession and are evaluated using the Clinical Performance Instrument (CPI). This study examined the relationship between clinical performance and emotional intelligence. **Subjects.** Fifty-six graduate physical therapy students (46 female, 10 male) between the ages of 23 to 38 years (25.7 $\pm$ 3.6 years) from four Eastern Massachusetts schools participated. **Methods.** Clinical Performance Instrument (CPI) scores (version 4), the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT version 2.0) scores, Graduate Record Exam (GRE) scores, pre-requisite grade point averages (GPAs) and demographic information were collected. **Results.** Total CPI score ($R^2 = 0.36$, $p < 0.02$) and scores on individual items of Professional Behavior ($R^2 = 0.31$), Performing Interventions ($R^2 = 0.35$, $p < 0.04$) and Performing an Examination ($R^2 = 0.28$) were not significantly related to emotional intelligence. Emotional intelligence was not significantly related to GRE scores ($r = .14$, $p = 0.31$) or pre-requisite school GPA ($r = 0.10$, $p = 0.46$). **Discussion and Conclusion.** Within the limitations of this research, the MSCEIT did not prove to be a successful predictor either by itself or in combination with other variables in predicting CPI performance. Future work with emotional intelligence surveys as predictors of CPI performance should start with examining those who pass the clinical experience part of the PT program compared to those who do not. After understanding the relationship between success and failure on the CPI, an examination of those that score high on the CPI versus those that merely pass could be studied.

INTRODUCTION

For many years, past academic performance has been given primary consideration in evaluating applicants for professional health programs and medical schools. The purpose of the graduate program admission process in physical therapy (PT) is to evaluate information that can predict an individual's potential for success in the program. Attrition occurring in mid-program has monetary implication for the PT schools and costs the profession a clinician. In addition, sending a poor student out to a clinic can negatively affect the relationship between the school and clinical training sites. Currently, a candidate's success is predicted using pre-requisite grade point averages (GPAs) and Graduate Record Exam (GRE) scores. The GRE and undergraduate GPAs are predictive of academic school performance.[1-3] However, success in a program requires more than doing well in academic classes; it requires proficiency in the laboratory and the clinical setting as well. To perform well in the clinic requires proficiency in the three domains of learning: cognitive abilities, psychomotor skills, and affective behaviors. Cognitive ability is the physical therapy knowledge base to properly assess and treat a specific injury. Having the necessary psychomotor skills refers to the therapist properly executing a specific set of assessment tests and providing the actual physical treatments. Affective behaviors refer to the therapist effectively interacting with the patient in a caring and sensitive manner, e.g., exhibiting a good "bed-side manner."

Physical therapy generic abilities, important in the clinical setting, are important to master before one graduates from a professional physical therapy program.[4] Generic abilities have been identified by the faculty of the Physical Therapy Department at the University of Wisconsin-Madison and are found in the Clinical Performance Instrument (CPI) as attributes, characteristics, or behaviors that are not explicitly part of a profession's core of knowledge and technical skills, but nevertheless are required for success in the profession.[4] These ten abilities described by May et al.[4] are defined in Table 1.

Three professional documents developed by the American Physical Therapy Association (APTA) explicitly state that interpersonal skills, communication, and professional behavior are required by the clinician and demonstrates the importance of these generic abilities.[5-7] It is during the clinical experience that these generic abilities are assessed. Students can fail the clinical experience and eventually the program if they lack these abilities. The CPI is an ability-based psychometric form used by the majority of APTA professional physical therapy programs in the nation for evaluating student clinical performance utilizing these generic abilities. This instrument was developed to objectively evaluate 24 performance criteria within the cognitive, psychomotor, and affective learning domains.

Table 1. Generic Abilities and Definitions[4]

Generic Ability	Definition
1. Commitment to Learning	**The ability to self-assess, self-correct, and self direct; to identify needs and sources of learning; and to continually seek new knowledge and understanding.**
2. Interpersonal skills	**The ability to interact effectively with patients, families, colleagues, other health care professionals, and the community and to deal effectively with cultural and ethnic diversity issues.**
3. Communication skills	**The ability to communicate effectively (i.e. speaking, body language, reading, writing, listening) for varied audiences and purposes.**
4. Effective use of time and resources	**The ability to obtain the maximum benefit from a minimum investment of time and resources.**
5. Use of constructive Feedback	**The ability to identify sources of and seek out feedback and to effectively use and provide feedback for improving personal interaction.**
6. Problem solving	**The ability to recognize and define problems, analyze data, develop and implement solutions, and evaluate outcomes.**
7. Professionalism	**The ability to exhibit appropriate professional conduct and to represent the profession effectively.**
8. Responsibility	**The ability to fulfill commitments and to be accountable for actions and outcomes.**
9. Critical Thinking	**The ability to question logically; to identify, generate, and evaluate elements of logical argument; to recognize and differentiate facts, illusions, assumptions, and hidden assumptions; and to distinguish the relevant form the irrelevant.**
10. Stress management	**The ability to identify sources of stress and to develop effective coping behaviors**

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Using an admission process that selects the best applicants with both academic ability and PT generic abilities may increase student retention and pass rates. Current pre-admission testing falls short of screening for the multiple abilities required to meet all the demands of these professional programs. Undergraduate GPAs have not been found to be a significant predictor of clinical performance in PT students, occupational therapy students, or medical students.[8-10] Similarly, GREs have not been found to be a predictor of clinical performance in PT students. One study conducted on students in a family therapy doctoral program did not find that GREs were predictive of clinical performance.[11] Schools have traditionally used interviews to assess non-cognitive abilities in an attempt to predict clinical performance. However, a study by Levine et al. found no correlation between interviews and professional academic and clinical performance on 56 physical therapy students and no significant difference in the attrition rates between universities that perform interviews versus those that do not.[12]

Carrothers developed an emotional intelligence instrument to be used during the medical school admission interview with the intent to select candidates with high personal and interpersonal qualities and abilities.[13] Assessing emotional intelligence with an objective test instead of the interview may be a better predictor to gauge future clinical performance. Clinical staff nurses with higher emotional intelligence had higher nursing performance evaluations, longer careers, and greater job retention.[14] While there has been a reasonable amount of research conducted assessing emotional intelligence within the medical field, there has been a dearth of research within the physical therapy profession. Larin et al. report that emotional intelligence levels did not significantly change after the first academic year of a professional physical therapy program.[15] Boyce showed that master's level physical therapy students possessed a moderate level of emotional intelligence, and it was not related to academic performance.[16] Emotional intelligence was found to be a critical component for clinical success in medical students.[17-20] Physicians' happiness level, a subscale of emotional intelligence, was related to the satisfaction of care in their patients. Those physicians who exhibited higher happiness levels had patients who were more satisfied with their level of care.[21]

With regard to non-medical programs, emotional intelligence score differences were shown to be a significant discriminator with regard to academic performance among university students.[22] Schutte found that 10% of the variance in academic success in first year university students could be predicted from emotional intelligence ability.[23] Emotional intelligence has also been shown to be an important ability component for success in business management personnel, and debt collectors.[24, 25] Companies are seeking to hire candidates with high levels of interpersonal skills, good communication skills, are effective team players, and show leadership, ingenuity, and motivation in the work place.[26] These attributes are in addition to the cognitive or intellectual skills needed to meet the requirements of the vacant position.

Many of these attributes important in other fields are the same as those cited as being important to the physical therapy profession and appear to be part of emotional intelligence constructs. Part of the confusion regarding whether emotional intelligence is related to clinical performance in the medical field is how emotional intelligence is measured. Emotional intelligence may be a significant predictor of CPI scores with those scoring high on emotional intelligence being more likely to have higher clinical performance evaluations.

PURPOSE

The specific goals of this study were to examine the relationship between emotional intelligence and CPI performance, and to assess the predictive capability of emotional intelligence, GRE scores, age, and gender to CPI performance. The following research questions were addressed:

1. Are emotional intelligence scores of physical therapy graduate students related to their clinical performance, as measured by specific items on the CPI and total CPI?
2. Are emotional intelligence scores of physical therapy students related to GRE scores?
3. Are emotional intelligence scores of physical therapy students related to previous academic performance using pre-requisite GPAs?

METHODS

Volunteers

Forty-six female and ten male students currently enrolled in four accredited university or college programs participated in the study. The mean age of study participants was 25.7 $\pm$ 3.6 years with a range of 23 to 38 years. Forty-three of the participants were second year students, and thirteen were third year students. Fifty-four students were doctoral students and two were in the masters program. The inclusion criteria for this study were those students in the program who had completed one or more clinical experience evaluations and had taken GRE exams.

Procedure

To maintain consistency across schools during the recruitment process, a standardized briefing was given to potential volunteers at each school. Students were admitted into the study after signing the Internal Review Board (IRB) approved informed consent. Demographic data using a survey were collected from the students on the same day of the briefing. The following demographic data was obtained: age, gender, school, program type (master's vs. doctoral), and year in the program. Each participant received a packet of information which included a cover letter explaining the study and instructions for completing the online emotional intelligence test within three weeks at their convenience. A randomly assigned identification number to ensure confidentiality of the data transmitted over the internet was provided. Participants were sent up to three e-mail reminders to take the online test. Of the 91 students eligible to participate, 77 enrolled and 56 completed the study. The principal investigator obtained the GRE scores, pre-requisite GPAs, and CPI scores directly from the PT schools. Pre-requisite GPA is a specific set of classes (ranging from 8-14) that are determined by each graduate PT school. The GRE consisted of three scores: verbal, quantitative, and

analytical. Each section was scored on a scale of 200 to 800, for a possible maximum total score of 2400. When there were two sets of GRE scores in the student's file the highest score from each of the categories were used. Pre-requisite GPAs were based on a 4.0 scale.

The emotional intelligence test used was the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) - Version 2.0.[27] This test was chosen over the self-report tests that ask personal questions and are easy for subjects to fake their answer to make a good impression.[22] Schutte et al. found the MSCEIT to be the most comprehensive assessments of emotional intelligence.[23] Barchard found the MSCEIT (Version 1.1) to have good internal consistency.[28]

The principal investigator was notified automatically via an e-mail after a volunteer completed the MSCEIT through its publisher, Multi-Health Systems, Inc. (MHS).[27] The MSCEIT score was calculated by MHS' program software using a general consensus method as recommended by MSCEIT User's Manual.[27] General consensus refers to the answer that is considered correct by the majority of people.[27] Also, no corrections for age, gender, or ethnicity were performed while scoring. A score of 100 is average with a standard deviation of 15. The highest possible score is 167. Table 2 demonstrates the qualitative descriptors developed by MHS for ranges of scores on the MSCEIT.[27] The overall reliability of the MSCEIT is r = .93 for general consensus scoring.[29] The test-retest reliability is r = .86.[23, 30]

Table 2. Emotional Intelligence Scores, Qualitative Descriptors[27] and Percentiles[27]

Emotional Intelligence Total Score	Qualitative Description	Percentiles
130-167	Significant Strength	
120-129	Strength	
110-119	Competent	**115 = 84th percentile**
100-109	High Average Score	
90-99	Low Average Score	
78-89	Consider Improvement	**85 = 16th percentile**
<78	**Consider Development**	

Independent measurements (predictors) collected included demographic variables (age, gender, and school) and performance measures (pre-requisite GPA, total GRE score, math GRE score, verbal GRE score, analytical GRE score, and emotional intelligence total score). The dependent measure predicted was CPI total score. Also predicted were CPI individual scores "Demonstrates professional behavior during interactions with others" (CP3), "Performs a physical therapy examination" (CP11) and "Performs interventions in a competent manner" (CP14) as shown in Table 3. These sub-items were chosen because they are the items that would most likely be related to emotional intelligence and are the more comprehensive items. For example CP2 "Presents self in a professional manner" is less comprehensive than CP3 but would be highly correlated to CP3. In addition, to minimize the effects of committing a Type I error the number of sub-items examined were limited to 3 items of the total 24 possible items and chosen *a priori.*

Data Analysis

Data were analyzed using SPSS Version 15 Software (SPSS Inc., Chicago, IL). Descriptive statistics are reported as means, standard deviations and ranges. Multiple linear regression was used to determine the relationship between the predictor variables and clinical performance.

Table 3. CPI Items and Definitions

CPI Item	Definition
3. Demonstrates professional behavior during interactions with others	Maintains productive working relationships with patients, families, CI and others; treats others with positive regard, dignity, respect, and compassion; maintains objectivity; demonstrates behaviors that contribute to a positive work environment; accepts criticism without defensiveness; manages conflict in constructive ways; makes choices after considering the consequences to self and others; assumes responsibility for choices made in situations presenting legal or ethical dilemmas; maintains patient privacy and modesty (e.g., draping, confidentiality).
11. Performs a physical therapy patient examination.	Selects reliable and valid physical therapy examination methods relevant to the chief complaint, results of screening, and history of the patient; obtains accurate information by performing the selected examination methods; adjusts examination according to patient response; performs examination minimizing risk to patient, self and others involved in the delivery of the patient's care; performs physical therapy examination procedures in a technically correct manner.
14. Performs physical therapy interventions in a competent manner	Performs effective, efficient, fluid, and coordinated movement in providing technically competent interventions for patients; performs interventions consistent with the plan of care; provides intervention in a manner minimizing risk to self, to the patient, and to others involved in the delivery of the patient's care; uses intervention time efficiently and effectively; adapts intervention to meet the individual needs and responses of the patient.

Adapted with permission by the American Physical Therapy Association from *Physical Therapy Clinical Performance Instruments*, Alexandria, Virginia, American Physical Therapy Association, 1998. [31]

RESULTS

Demographics

No differences between schools existed in any of the measured variables: GRE, emotional intelligence, pre-requisite GPA, and age. Table 4 presents the descriptive statistics for emotional intelligence, GRE, pre-requisite GPA, CPI scores (total and CP3, CP11 and CP14). GRE scores are high. The CP11 scores had the most variability and had the lowest score.

Table 4. Descriptive Statistics for Emotional Intelligence, GRE, GPA, and Clinical Performance Scores

	Whole Group		
	Mean	**Standard Deviation**	Range
Emotional Intelligence Score	101.69	11.29	**71.04 - 121.48**
GRE	1739	217.49	**1050 - 2230**
Pre-requisite GPA	3.37	0.42	**2.67 - 4.00**
CPI Total Score	88	10.13	**62 - 100**
CPI Item 3	96	7.60	**70 - 100**
CPI Item 11	83	14.10	**52 - 100**
CPI Item 14	**88**	**11.83**	**56 - 100**

Table 5 presents the distribution, qualitative range, and frequency of the emotional intelligence standard scores by the sample as a whole. Also included in the table are the descriptive statistics (means and standard deviations) of the emotional intelligence standard scores, pre-requisite GPA, and GRE scores by emotional intelligence qualitative range. There was good distribution across all qualitative ranges for this sample a greater percentage of people had higher emotional intelligence ability.

Table 5. Distribution of Emotional Intelligence Scores and Descriptive Statistics of Emotional Intelligence, GPA, and GREs

Standard Score EI	Qualitative Range EI	% Students	EI		CP		Pre-Requisite GPA		GRE	
			Mean	SD	Mean	SD	Mean	SD	Mean	SD
70-89	Consider Improvement	16	83.94	5.73	85.70	11.56	3.33	0.30	**1650**	**318**
90-99	Low Average	29	96.80	2.47	86.96	11.12	3.40	0.30	**1726**	**169**
100-109	High Average	21	103.55	2.97	87.78	7.73	3.28	0.27	**1763**	**206**
110-129	**Competent/Strength**	**34**	**114.09**	**3.47**	**87.86**	**10.61**	**3.50**	**0.34**	**1742**	**214**

**Qualitative range and standard score from Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) User's Manual by John D. Mayer, Peter Salovey and David R. Caruso, 2003, New York: Multi-Health Systems Inc. Copyright ©2002, Multi-Health Systems Inc. All rights reserved. P.O. Box 950, North Tonawanda, NY 14120-0950, 1-800-456-3003. In Canada, 3770 Victoria Park Ave., Box 950, Toronto, ON M2H 3M6, 1-800-268-6011. Internationally, +1-416-492-2627.Fax, +1-416-492-3343. Reproduced with permission.*

The mean emotional intelligence score for the study sample of professional physical therapy students was "average" at 101.69 ± 11.29 with a range of 71.04 - 121.48. Sixteen percent (16%) scored in the lower "Consider Improvement" category on the emotional intelligence test. This group also had the second lowest GPA mean. Thirty-four percent of the students achieved scores in these combined categories of "Competent and Strength." The majority of emotional intelligence scores (55%) reached the "High" or greater category.

There was a significant relationship when entering emotional intelligence total score and the other potential predictor variables (pre-requisite GPA, GRE scores, age, school, and gender) to total CPI score ($R^2 = 0.36$, $p < 0.02$). However, only two variables entered into the equation were significant predictors, age and pre-requisite GPA. Entering just pre-requisite GPA and age into a new regression equation produced a non-significant ($R^2 = 0.01$) prediction. Two of the individual CPI items, professional behavior ($R^2 = 0.31$) and performing examinations ($R^2 = 0.28$) could not be significantly predicted with emotional intelligence and the other potential predictor variables. With respect to performing interventions, a significant equation was observed ($R^2 = 0.35$, $p < 0.04$) using the same potential predictors listed above. However, the only item that contributed significantly was total emotional intelligence score. When entering just total emotional intelligence score into a separate regression equation a non-significant relationship ($R^2 = 0.08$) was observed. Emotional intelligence was not significantly related to GRE scores ($r = .14$, $p = 0.31$) or pre-requisite school GPA ($r = 0.10$, $p = 0.46$).

DISCUSSION

Previous studies have stated that an evaluation tool capable of predicting clinical performance is needed but has not yet been identified.[16] It was hypothesized in this study that emotional intelligence may be a predictor either by itself or in combination with other measures in predicting clinical performance outcomes of PT students. Determining the relationship of standardized testing outcomes to practice behaviors is important in these professions. This study found that emotional intelligence was not related to clinical performance total score, nor was it related to three of the specific CPI items examined. There are a number of potential causes for the lack of meaningful correlation between the level of emotional intelligence and clinical performance. First, it is possible that emotional intelligence is related to CPI scores but a meaningful relationship was not found because of the homogeneity of the data. All volunteers had already been admitted to the program and successfully made it through to their 2nd or 3rd year of a graduate PT program. The requirements to get into the program and stay in the program are stringent resulting in relatively small differences in academic performance of the students in this study. Second, students that were on the verge of failing academically or clinically may not have been captured as volunteers in this study. Students that are struggling academically or clinically may not have wanted to devote the extra time to volunteer for this study nor have emotional intelligence assessed and their academic records revealed.

A third possibility is that the emotional intelligence measurement instrument used in this study, the MSCEIT, did not possess the necessary specificity or sensitivity to assess the subtle aspects of emotional intelligence that may be related to CPI performance. Carrothers developed a specific emotional intelligence instrument to be used during the medical school admission process.[13]

Perhaps this instrument, edited slightly to pertain to PT students, would provide the necessary attributes to discriminate amongst high and lower scores of students evaluated on the CPI.

In addition, it is possible that emotional intelligence is measuring a different construct than the PT generic abilities. While conceptually, it appeared that these abilities might be the similar, it should be acknowledged that no other study to date has shown emotional intelligence to be related to the generic PT abilities. However, there was also a lack of studies reporting no relationship between emotional intelligence and CPI scores either, perhaps related to a bias of not publishing non-significant findings.[32]

It was assumed in this study that emotional intelligence would not change during the program, which is supported by findings by Larin, et al.[15] However, the present study design did not allow for this finding to be confirmed or refuted. Previous research has shown that with a concentrated effort, emotional intelligence can be improved.[22] It may be worth investigating if emotional intelligence changes over time as students progress through the three year program. If emotional intelligence could be acquired/learned and it were found to be related to clinical performance, then identifying those lacking in ability and offering training to improve emotional intelligence abilities early in the program may increase program pass and retention rates.

While emotional intelligence did not show a meaningful relationship to clinical performance, neither did pre-requisite GPA, one of the criteria currently used in admission to the program. This finding was not surprising as these results confirm previous findings that showed GPA not to be related to clinical performance.[3,9,12] Likewise, GRE scores were unrelated to clinical performance. There was also no relationship between emotional intelligence and GPA or GRE scores. These results support the findings of Newsome et al., Boyce, and Schutte et al. who all concluded that no relationship exists between emotional intelligence and GPA.[16,23,38] However, the problem still exists of how do PT programs screen PT graduate school candidates to ensure that they possess the attributes necessary to meet all the demands of the rigorous program? One possibility that may help address this question would be a study of emotional intelligence of students at the time they are applying to programs. One could examine if those who are admitted to the program differ from those who are not admitted. Another possibility is to examine if those students that cease their studies differ from those who continue in the program and eventually graduate.

CONCLUSIONS

This research examined the role of emotional intelligence in predicting success in professional PT graduate programs. There is limited published research with regard to which attributes contribute to a successful physical therapist. To date there are no screening tools that can be used in the admission process to screen for clinical practice abilities. This study hypothesized that the MSCEIT might be an appropriate tool to assess the impact of the level of emotional intelligence on CPI performance. Within the limitations of this research, the MSCEIT did not prove to be a successful predictor either by itself or in combination with other variables in predicting CPI performance. Future work with emotional intelligence surveys as predictors of CPI performance of PT students should start with examining those who pass the clinical experience part of the PT program compared to those who do not. After understanding the relationship between success and failure on the CPI, an examination of those that score high on the CPI versus those that merely pass, could be studied.

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