REVIEWS

Emotional Intelligence as a Predictor of Academic and/or Professional Success

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The concept of "emotional intelligence" has been extensively popularized in the lay press and corporate world as individuals purport the potential ability of emotional intelligence to predict various markers of success. Emotional intelligence (EI) most commonly incorporates concepts of emotional expression and regulation, self-awareness, and empathy. The concept has been criticized by some for its loose definition and parallels to personality traits. Additionally, several limitations to the instruments used to measure emotional intelligence have been identified. This review examines the foundations of the definitions of emotional intelligence as well as existing educational research involving emotional intelligence, both within the health professions and externally. Recommendations for future research and research potential are discussed.

Keywords: emotional intelligence, general intelligence, academic success, performance

INTRODUCTION

Most institutions of higher learning and professional disciplines must ascertain predictors of ability or success in order to make student admissions and assessment decisions. Traditional markers of ability and success, such as grade point average (GPA) and standardized test scores, have varying degrees of predictive value.[1-5] Some institutions employ additional methods to select candidates for admission including but not limited to writing samples, personality inventories, on-site individual interviews, and group interviews.[3,6] Colleges and schools of pharmacy are increasingly scrutinizing their student admissions processes for several reasons. A nationwide shortage of pharmacy practitioners has led to the proliferation of new colleges and schools of pharmacy and forced many existing institutions to increase class sizes.[7] This turn of events has resulted in greater numbers of candidates for admission and the need for greater scrutiny in these processes as colleges compete for the same applicant pool.[7]

Paralleling these changes in the dynamics of the profession has been a growing consensus among faculty members that current pharmacy students often lack empathy and a commitment to pharmacy's professional standards.[8-10] This phenomenon may be occurring for several reasons. With the introduction of several new

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colleges and schools of pharmacy as well as increasing class sizes, greater competition for the pool of qualified or best applicants can be expected. Colleges and schools may be admitting students who are less prepared or who do not fully understand the profession's role and responsibilities in health care. Alternatively, this perceived change in the profile of pharmacy students may be a result of an amalgam of causes, including cultural and/or societal changes that produce a different type of student.[9,10] Today's students may be more concerned with the technical aspects of various professions and more emotionally immature compared to previous generations of learners.[9,10] Regardless of the etiology of the changing profile of students, most colleges and schools are struggling to admit the most qualified applicants. Traditional admissions markers may predict successful academic performance but may not capture many intangible characteristics, behavioral variations, and traits that may be more critical to successful pharmacy practice and life in general.[11] These intangible characteristics, such as empathy, social maturity, and self-awareness may be essential components required for connecting with and caring for patients. Many corporations have examined and to some extent used emotional intelligence as a measure of these intangible characteristics, which some speculate are better predictors of educational and occupational performance.[12,13] Many proponents claim that emotional intelligence may be a distinguishing characteristic of great leaders.[12] Recognizing that aspects of emotional intelligence are central to the provision of care, several health

professions have experimented with strategies aimed at measuring and/or modifying emotional intelligence. No studies involving emotional intelligence have been reported among cohorts of pharmacy students or pharmacists. This paper will review the foundations and proposed definitions of the concept of emotional intelligence as well as discuss health professions and non-health profession trials and issues in this area.

Emotional Intelligence

The concept of EI has roots in discussions that began as early as the late 1930s, when researchers began describing a non-intellective intelligence sometimes described as "social intelligence."[14] EI itself was first defined in the early 1990s by Salvoy and Meyers as "a type of social intelligence that involves the ability to monitor one's own and others' emotions, to discriminate among them, and to use this information to guide one's thinking and actions."[15] Salvoy and Meyers expanded their definition to include "the verbal and non-verbal appraisal and expression of emotion, the regulation of emotion in the self and others, and the utilization of emotional content in problem-solving." Conversely, general intelligence has been defined as a person's overall capacity for adaptation through effective cognition and information processing.[16] In simpler terms, emotional intelligence might be defined as the set of skills people use to read, understand, and react effectively to emotional signals sent by others and oneself.[15] These are skills such as empathy, problem-solving, optimism, and self-awareness which allow people to reflect, react to, and understand various environmental situations.

In assessing any form of intelligence, descriptive models must meet 3 standards.[16] First, an intelligence should be capable of reflecting mental performance rather than preferred ways of behaving, a person's self-esteem, or non-intellectual attainments. New forms of intelligence should also meet prescribed correlational criteria. Lastly, intelligence should vary with experience and age. Meeting these criteria would establish emotional intelligence as a set of abilities rather than a preferred way of behaving or a personality trait. Some researchers claim that emotional intelligence meets all 3 of the aforementioned criteria.[16,17] Several measures of emotional intelligence have been developed and the various criteria used by different measures may converge.[16] In fulfilling the second criterion, some emotional intelligence measures have been validated and appear to have associations with empathy, warmth, and emotional openness.[18] Associations with outside criteria such as scholastic aptitude tests also appear to exist. Finally, a reported difference in emotional intelligence scores between adolescents and adults provides support for meeting the final criterion for a new form of intelligence.[18,19]

Common criticisms of emotional intelligence and emotional intelligence measures are the multitude of qualities encompassed by the concept and its loosely defined nature.[20-22] Some authors have described overlaps between emotional intelligence models and personality constructs. Therefore, careful analysis is required to determine what is and what is not emotional intelligence. This criticism extends to the instruments used to measure and assess emotional intelligence.[22] Various instruments exist and are either self-report (ie, Bar-On EQ-I), ability-based (Multi-Factor Emotional Intelligence Scale [MEIS]), or a combination of these types. No single test is considered to be a gold standard for assessment. Ability-based assessments generally involve hands-on problem sets and require greater resource commitments in terms of cost and time; however, they are considered by most to be more accurate than self-report.[22] All of these instruments have been criticized for deficiencies in validity. Strong validity data may be lacking in part due to the varied definitions of the concept of emotional intelligence itself.[20-22] Without a stringent definition of emotional intelligence, each instrument may be measuring slightly different constructs. Some researchers feel that instruments designed to measure emotional intelligence may actually assess personality characteristics or emotional competence rather than emotional intelligence.[20,22]

Emotional Intelligence and Academics

Various investigators have engaged in research designed to examine and apply emotional intelligence constructs within academic, medical, and other learning settings (Table 1). A Medline search was conducted to identify literature in this area as it pertains to the health sciences. Additional health science and non-health science research papers were then identified using references listed by primary authors of these studies. Since research in this area as it applies to education is limited, all identified studies were included in this review and the limitations identified.

Lam et al investigated the notion that advanced emotional intelligence was correlated with greater individual performance, often above and beyond that associated with one's level of general intelligence.[23] Researchers examined a cohort of 304 undergraduate students (152 men and 152 women) at a University in the western United States. Each participant completed the Multifactor Emotional Intelligence Scale (MEIS). The Shipley Institute of Living IQ Scale was used to determine general intelligence. Cognitive-based performance was assessed using 8 problems selected from a previously published logical reasoning

Table 1. Summary of Emotional Intelligence Research Trials

Investigators	Objective	Study Sample	Study Instruments	Results	Limitations
Lam et al[23]	To determine if EI is associated with performance beyond ones general intellectual abilities.	304 undergraduate students (152 males, 152 females)	Multifactor emotional intelligence scale (MEIS); Shipley Institute of Living IQ Scale	A positive relationship between EI scores above and beyond general intelligence was demonstrated ($p < 0.01$).	Use of situational assessments of general intelligence. Homogeneity of study sample. Reliability of the MEIS instrument.
Jagger et al[24]	To determine the effects of instruction in the area of EI on academic performance in a graduate level management course.	150 total students in 5 sections of a general management graduate course; 31 students from the study cohort comprised the intervention group.	Bar-On EQi	Significant increases in pre versus post EQi scores were documented in the intervention group ($P < 0.001$). Levels of EI were correlated positively with academic performance as measured by final project grades.	Small sample size of the intervention group (n = 31). Reliability of the Bar-On® EQi instrument.
Wagner et al[30]	To develop an instructional module designed to both enhance student's understandings of EI and to improve their own EI scores.	First year medical students. Demographics and sample size not reported.	Bar-On EQi	Study in progress and no results reported to date.	Pilot study. Lack of descriptors regarding the study sample.
Elam et al[31]	To prospectively measure the emotional intelligence of incoming medical school students.	The entering Class of 2000 at the University of Kentucky College of Medicine (n = 101).	Trait Meta-Mood Scale (TMMS); Davis' Interpersonal Reactivity Index (DIRI)	Response rate of 90%. Cornbach's alpha demonstrated moderate internal consistency between the various scales (r = 0.44).	Pilot study employing a convenience sample.
Carrothers et al[32]	To develop and pilot test a semantic differential instrument for measuring medical school applicants emotional intelligence.	147 medical school applicants from 3 consortium medical schools. Study sample was composed of 83 females and 64 males.	Self-developed EI instrument which was based on similar reports as well as input from the admissions committees of each respective medical school.	ACT score ($r^2 = 0.084$) and GPA ($r^2 = 0.138$) were not well correlated with the EI instrument. Interview assessment scores were correlated ($r^2 = 0.761$). Sub-analysis of EI scores found a correlation between EI scores among those applicants with backgrounds in the arts and humanities. Overall EI scores were higher in females than males.	Incompleteness of some applicant information forced exclusion of some participants therefore the study sample was not all inclusive. The EI instrument is limited in that it cannot be used to predict actual medical school performance.

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Study	Objective	Sample	Instruments	Results	Limitations
Wagner et al[33]	To investigate the relationship between EI scores and patient satisfaction with medical care.	14 family physicians and 16 family medicine residents at a southern medical school. Average physician age, 37.7 years, and average years in practice, 8.06. The patient cohort consisted of 232 ambulatory persons (24% male and 76% female).	Bar-On EQi; Commonwealth Patient Satisfaction Survey.	Physicians were separated into 2 cohorts, those with 100% patient satisfaction (n = 11) and those without (n = 19). Poor correlation between patient satisfaction and most every sub-scale of the Bar-On® EQi. A weak correlation was found in relation to physician mood.	Thresholds used to define patient satisfaction were stringently defined. Small sample size.
Pau et al[34]	To investigate the relationship between EI and perceived stress among dental undergraduates.	213 dental school undergraduates with a mean age of 21.3 years. 48% of the study sample was male.	Schuette EI Scale; Perceived Stress Scales (PSS-10).	Mean EI scores were significantly higher among females ($p < 0.05$). Mean perceived stress scores were higher among those over 21 years of age ($p < 0.001$) and for those in higher years of school ($p < 0.001$). Mean PSS-10 scores were inversely related to EI scores.	Cross-sectional study design using a convenience sample.
Pau et al[35]	To investigate how dental school undergraduates with differing levels of EI cope with stress.	Subjects were selected from a cohort of dental school undergraduates and stratified into groups with high vs. low EI. From each EI group, 1 male and 1 female were randomly selected to comprise a cohort of 10 subjects that represented each year of dental school.	Schuette EI scale; unstructured face to face interviews.	Higher EI students were more likely to adopt reflection and appraisal and social/interpersonal methods of stress coping. While low EI students were more likely to engage in health damaging behaviors (e.g., tobacco use, over eating) as a means of stress coping.	Small sample size. Qualitative nature of study design which relied upon interviewer assessments.

test. A demographic questionnaire was also completed by each subject. The mean age of the cohort was 20.8 years and 88.5% of respondents were Caucasian. In order to demonstrate validity, the Shipley Scale IQ was shown to significantly and positively correlate with participant SAT scores. Researchers found that overall emotional intelligence contributed to individual cognitive-based performance over and above the level attributable to general intelligence, and this relationship was positive ($p < 0.01$). The study findings are limited in that the use of specific cognitive-based assessments and generalizability may be hampered beyond the situational assessments employed in the study. Additionally, the generalizability of the study is limited by the degree of reliability of the MEIS and the homogeneity of the study sample.

Jaeger studied the effects of emotional intelligence instruction on academic performance among a convenience sample of 150 students in 5 sections of a general management graduate-level course in the northeastern United States.[24] Additional data regarding the demographics of the study cohort was not provided by the authors. Students registering for 1 of the 5 sections of the course were blinded to the study goals. In 1 of the 5 sections (intervention group, n = 31), formal instruction regarding emotional intelligence was incorporated into the curriculum. The remaining 4 sections of the course did not have any formal or informal discussion of emotional intelligence. All students completed a preintervention and postintervention Bar-On E-Qi test, but only students in the intervention section were provided with the results and an analysis. Academic performance was measured by the final project course grade achieved by individual students. Final project grades were selected as the dependent measure since in the intervention group these grades would reflect only learning that occurred following the emotional intelligence instruction. Beginning level of knowledge was controlled for through the examination of GPAs for each subject. Teaching effectiveness was also controlled for by using mean scores from teaching evaluations submitted by students at the conclusion of the semester. Using the Games-Howell posthoc test, researchers found statistically significant increases in EQi scores among the students who completed the emotional intelligence curriculum compared with scores of students in the group that was not given the emotional intelligence curriculum, although scores in both groups improved. Mean EQi scores in the emotional intelligence curriculum group improved from 101.16 to 111.06 ($p < 0.001$) and in the non-emotional intelligence curriculum group from 101.92 to 103.7 ($p < 0.01$). Levels of emotional intelligence at the end of the study period were associated with academic performance, with a greater correlation existing in the emotional intelligence curriculum group. These findings led researchers to conclude that emotional intelligence could be taught or learned and is not a fixed parameter. Additionally, greater levels of emotional intelligence can be expected to correlate with academic performance even when controlling for traditional markers of intelligence, such as GPA. Limitations to this research include the small sample size (particularly of the emotional intelligence curriculum group) and inherent limits of the scales and instruments used in this trial.

Emotional Intelligence and the Health Professions

Health professions have been described as an amalgam of clinical competence and a service-orientation towards caring.[25] Aptitudes for a service and caring orientation may be reflected by one's emotional intelligence. Some believe that recent proliferations in technological advances have resulted in an overemphasis on clinical competence and a disproportionate emphasis on service and caring within the health professions. This may certainly be true of pharmacy, in which in the last century modernization of medication production processes and dispensing systems has resulted in a reduced need for individualized compounding and pharmacist-patient interactions.[7,26] Only recently has the profession begun to renew its commitment to patient-centered practice.[27]

All health care professions are rooted in a need to establish therapeutic relationships with patients. Within these relationships, the professional must respond to both the technical aspects of disease as well as associated emotional aspects. A specific example from pharmacy practice might involve recognition that adherence to treatment regimens can be improved not only with attention to a patient's technical needs but also to emotional requirements in fulfilling their therapeutic covenant. The capacity to develop this kind of a relationship (ie, patient-pharmacist) may be facilitated by one's emotional intelligence.[25,28-29] If this theory holds true and with various managed care and other environmental constraints being placed upon practitioners from all health fields, it may become critical for students in the health professions to have emotional intelligence to provide high-quality patient care.

Recognizing the potential for significant contributions of emotional intelligence to patient outcomes, some suggest that it is important to expect, recognize, develop, and assess emotional intelligence within health professions education. Several researchers have examined various aspects of emotional intelligence and how the concept may relate to the health professions.[30-35] These studies have taken multiple approaches with regard to the

aspects of emotional intelligence examined as well as methods by which emotional intelligence is measured. Some researchers have examined correlates to the admissions process while others have attempted interventional trials aimed at improving emotional intelligence scores. The majority of studies have involved medical and dental students. While the concept of emotional intelligence has been discussed in the nursing literature, no formal trials have been published.[25,28] Similarly, little is available in the pharmacy literature.

Some medical schools have experimented with various aspects of measuring and assessing emotional intelligence. As part of the Essentials of Clinical Medicine Course at the Medical College of Georgia, Wagner et al developed a module intended to increase medical students' understanding of emotional and interactional skills and to improve emotional intelligence.[30] Students and faculty members who enrolled in the course completed the Bar-On E-Qi and subsequently participated in a lecture series on emotional intelligence. Baseline demographic data for study participants were not reported by the authors. Subsequently, each participant received their EQi scores. Faculty members shared and reflected upon their scores and students were encouraged to do the same. The goals of this process were to allow students to gain a self-awareness of their emotional intelligence strengths and weaknesses and to improve their patient-physician interactions and to provide a more formalized approach to improving patient-physician interactions." No formal statistical or outcome data were collected by the investigator in this pilot study.

Elam et al sought to gather information related to emotional intelligence from entering medical students at the University of Kentucky (UK) College of Medicine.[31] Two existing scales, the Trait Meta-Mood Scale (TMMS) and the Davis' Interpersonal Reactivity Index (DIRI), were used to measure emotional intelligence. The TMMS is designed to assess individual differences in abilities to recognize, discriminate, and regulate moods and emotions, while the DIRI is a measure of empathy. Both instruments were administered to the 2000 entering class of the UK College of Medicine (n = 101), with a participation rate of 90%. No background information regarding the study participants was reported. Cronbach alpha assessment demonstrated internal consistency similar to previously published results. The researchers intend to use the garnered information to prospectively monitor the development of communication and interpersonal skills among the cohort. Additionally, students' emotional intelligence scores at admission will be compared to results from standardized patients' assessments of medical interviewing and interaction. The final goal of

this project is to identify the characteristics in individuals that determine emotional intelligence and which ultimately result in students becoming more effective physicians. The results of this secondary analysis have not yet been published.

In an effort to identify valid measurements that could be applied within a health professions framework, some researchers have developed and piloted emotional intelligence assessment instruments. Carrothers et al developed and piloted a trial of an emotional intelligence assessment instrument intended for applicants at 3 consortium medical schools.[32] Researchers developed a 34-item semantic differential instrument that was intended to measure emotional intelligence constructs. The instrument was based on extensive reviews of the emotional intelligence literature and repeated focus groups involving the admissions committees of the medical schools involved in the project. Information from the pilot test of the emotional intelligence instrument was not used for making any decisions with regard to admission. Using Pearson correlation coefficients, applicant scores on traditional admissions criteria (eg, GPA, interview scores, Aptitude College Test [ACT] scores) were compared with emotional intelligence instrument scores. The instrument was pilot tested, and complete data for analysis were available for 147 applicants. The applicant pool was composed of 83 women and 64 men. ACT score ($r2 = 0.084$) and GPA ($r2 = 0.138$) were not well correlated with the emotional intelligence instrument; however, interview assessment scores were correlated with emotional intelligence ($r^2 = 0.761$). In a sub-analysis of emotional intelligence scores categorized by medical school, those applicants who had matriculated from the institution considered to have the strongest requirements in terms of the arts and humanities had the highest overall emotional intelligence scores (mean overall emotional intelligence score of 186.5 versus 177.3 and 182.7). Additionally, variability in emotional intelligence scores at this institution was lower in comparison to the other institutions. Lastly, the authors compared emotional intelligence scores by applicant gender. The presumption in this testing was that women were more competent in interpersonal skills and thus should present with higher emotional intelligence scores. Researchers found that overall emotional intelligence scores were higher among women than men (189.2 vs.176.5). Furthermore, scores for each dimension of the instrument were higher among women with less variance. The authors concluded that based on this pilot study, the emotional intelligence instrument that was developed by the consortium demonstrated the ability to measure attributes that indicate desirable personal and interpersonal skills in medical school applicants. Additionally,

emotional intelligence seemed related to educational programs that included a strong emphasis on social sciences and the humanities. This study was limited in that complete admissions data were not available for all applicants, thus the sample size was not completely inclusive. These data are also restricted in that the instrument cannot be used to predict actual medical school performance unless a follow-up analysis is performed.

Even if the importance of emotional intelligence among health professions applicants is validated and ideal assessment instruments are identified, outcome data will need to correlate emotional intelligence capacity and actual outcomes. Outcomes might be defined in one of several ways, including but not limited to patient satisfaction. Wagner et al investigated the relationship between patient satisfaction and physicians' emotional intelligence scores as assessed using the Bar-On EQi instrument.[33] Fourteen family medicine faculty members and 16 family medicine residents at a southern US medical school completed the Bar-On EQi. Patients were recruited at the conclusion of an office visit to complete an 11-item patient satisfaction survey. Two scores were derived from the satisfaction survey: the "total satisfaction sum" and the "relationship satisfaction score." The total satisfaction score reflected patients' impressions of their overall health care, while the relationship score was more specific for services provided by their individual physician. Spearman rank order correlation coefficients and *t* tests were used to examine the relationship between EQi composite and subscale scores and patient satisfaction. The average age of the physician participants was 37.7 years and the average number of years in practice since receiving their medical degree was 8.1 years. The subjects were 232 ambulatory patients, of whom 24% were male and 76% female. Physicians were separated into 2 groups: those with 100% patient-reported relationship satisfaction (n = 11) and those with less than 100% satisfaction (n = 19). When correlating relationship satisfaction scores and Bar-On EQi scores, researchers found that only one EQi subscale (that of the physician's level of "happiness") had a weak correlation with patients' higher satisfaction. The "happiness" subscale most closely correlated with physician mood. This was not a surprising finding given that a physician's mood will often be transmitted to patients. This study was limited by the constructs used to define patient satisfaction (eg, 100% satisfaction) and the study's small sample size, which could only detect large effects. Despite this limitation, the researchers concluded that a health care professional's satisfaction with his/her own life and his/her personal happiness is a component in maximizing a patient's satisfaction with health care services.

Lastly, some investigators have examined relationships between emotional intelligence and the capacity to cope with stress. Since health professions education and training is associated with strenuous academic and non-academic demands and stressors, increased emotional intelligence might result in better stress coping mechanisms and thereby augment performance and/or lifestyle. Using a cross-sectional survey design, Pau et al investigated the relationship between emotional intelligence and perceived stress among a cohort of dental undergraduates.[34] Emotional intelligence was assessed using a validated instrument developed by Schuette et al, while perceived stress was measured using the Perceived Stress Scales (PSS-10).[35] T tests were used to compare mean scores. Two hundred and thirteen respondents completed the survey instrument for a response rate of 70%. Forty-eight percent of respondents were male and the mean age of the total sample was 21.3 years. Mean emotional intelligence and perceived stress scores were 117.5 (SD = 14.9) and 17.7 (SD = 6.5), respectively. The mean population norms for the PSS-10 scale is 13.0. Internal consistency (as determined by Cronbach's alpha assessment) for the emotional intelligence scale and PSS-10 were 0.9 and 0.86, respectively. Mean emotional intelligence scores of the women were significantly higher than those of the men ($p < 0.05$). Mean perceived stress scores were higher in students over 21 years of age ($p < 0.001$), female students ($p < 0.05$), and those in higher years of school ($p < 0.001$). Correlational analysis demonstrated that emotional intelligence scale scores were inversely related to PSS-10 scores. Researchers concluded that dental students with greater degrees of emotional intelligence may be more adept at coping and dealing with academic and non-academic stressful situations, and that reducing perceived stress may improve academic performance as well as patient satisfaction. The authors emphasize that modalities for improving emotional intelligence of dental students might also augment stress coping mechanisms. This study was limited by its cross-sectional design, which involved a convenience sample of a single academic institution.

In a follow-up report, Pau et al examined how dental undergraduates with differing levels of emotional intelligence dealt with stress.[35] Researchers selected a population of undergraduate dental students from a 5-year program and used the emotional intelligence scale by Schuette et al to determine emotional intelligence scores.[19] Subjects were then stratified into high and low emotional intelligence score groups using median scores as breakpoints. From each emotional intelligence group in each academic year, 1 male and 1 female student were randomly selected to comprise a cohort of 10 subjects that

represented all 5 years of the dental program. Each subject then underwent focused, in-depth, face-to-face interviews with blinded interviewers for the purposes of identifying predictors and coping mechanisms related to stress for each student. Each interview was then systematically transcribed and qualitatively analyzed. Four sets of coping strategies adopted at varying degrees of emotional intelligence were identified. Students with high emotional intelligence were more likely to adopt reflection and appraisal, social and intrapersonal, and organization and time-management skills. Students with low emotional intelligence were more likely to engage in health damaging behaviors (eg, procrastinating, social withdrawal, use of tobacco products). The study authors concluded that future research was needed to establish whether modalities aimed at enhancing emotional intelligence in dental students would result in better stress coping skills. This study was limited by its small sample size and the qualitative nature of the data and analysis.

DISCUSSION

While the corporate world seems to have embraced the concept of emotional intelligence as a predictor of worker success, this is less true within the health professions where research is lacking and a greater level of scrutiny can be expected. This is especially evident in pharmacy. A more natural relationship which predicts success might exist within the health professions, where if accepted as a construct, emotional intelligence may prove to be critical for the development of productive therapeutic pharmacist-patient relationships.

In order for pharmacists and pharmacy students to successfully provide care of any type, they must cultivate patient interactions that engender trust, empathy, and self-awareness. Additionally, the dynamic nature of the pharmacy profession, which in recent years has undergone both educational and professional paradigm shifts, may be best served by students and practitioners who can manage emotions, adapt to change, and manipulate stressful environments and situations. Whether emotional intelligence is a predictor of these skill sets has not been well described. Lack of research in this area by pharmacy and other health professions may be for one of several reasons. Most health professions have a long-standing history of relying upon traditional markers of intelligence to both predict successful completion of a degree program and to determine individual mastery of topics. Traditional measures have been used with relative reliability in predicting technical success for several years.[1-5] Often the use of newer, less traditional measures is met with resistance and questions of reliability and other limitations.

Potential researchers in this area should have a critical understanding of the underpinnings of the emotional intelligence debate. Many psychologists and intelligence experts fail to find differences between emotional intelligence and personality constructs and often identify the loosely defined nature of emotional intelligence as a major impediment to acceptance of the concept.[21-23] Others support the notion that existing data and research in this area are sufficiently robust to justify acceptance of emotional intelligence or at a minimum support of ongoing research in this area.[15-18] Both groups recognize the need to embrace a single definition and the need for better assessment instruments and measures.

Most instruments designed to measure emotional intelligence are either self-report scales or performance-based evaluations involving the completion of observed problem sets.[19,22] Performance-based assessments may provide better reliability since they assess demonstrated ability-based skills rather than self-reports; however, they are generally more costly and time consuming to perform. Additionally, performance-based tests are hindered by the objectivity in selecting what are considered correct responses to the problem sets posed to the test subjects. Self-report scales must be understandable to the test subject and are prone to response biases such as social desirability effects which may result in exaggerated responses. Self-report reliability may be increased by combining self-responses with peer assessments.[22] However, this introduces several research issues as well as the need for increased resources. All assessment instruments may be hindered by the loosely defined nature of emotional intelligence which makes concrete criteria for measurements difficult to define. Nevertheless, several instruments are available and researchers should recognize the limitations of both self-report and performance-based measures and the specific instrument from either category that is selected for use. Table 2 lists some of the more commonly cited and available instruments for assessing emotional intelligence. Additionally, research examining emotional intelligence should attempt to exclude as many confounders as possible. As a minimum, some have suggested that any research involving measurement of emotional intelligence should also include an analysis of academic success markers, personality (eg, the Big Five test), and technical knowledge.

CONCLUSION

Several potential implications regarding emotional intelligence exist for all health professions including pharmacy. Various studies examining emotional intelligence in other health professions have been conducted. No studies have examined the concept of emotional

Table 2. Major Emotional Intelligence Assessment Instruments

Instrument	Description	Advantages	Limitations
Emotional Competence Inventory (ECI)[22]	110 item self-report survey which includes peer and supervisor ratings.	Includes a performance based component.	Proprietary rights have limited peer reviewed assessment of results. Potential overlap with personality constructs.
Bar-On Emotional Quotient Inventory (EQi)[12,21,22]	133 item self-report survey.	Easily administered over 30 minutes. Adequate reliability. Rsults reported in an easily quantifiable fashion (eg, emotional intelligence quotient).	Weak validity data and potential overlap with personality constructs. Lacks an ability or performance based component.
Multifactor Emotional Intelligence Scale (MEIS)[12,20,22]	402 item abilities based survey with consensus scoring.	Includes an abilities based component.	Potential for scoring inconsistencies among consensus group.
Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT)[12,22]	Developed as an update to the MEIS. 141 item abilities based survey with consensus scoring.	Easier to administer and less time consuming than the MEIS. Relies upon both consensus and expert scoring.	Newer scale lacking published evaluations. Most data to support this instrument relies upon assumptions regarding the MEIS.

intelligence within the framework of pharmacy or pharmacy education. Given the current external environment of the profession, which includes pressures to increase student enrollment, the advent of several new colleges and schools of pharmacy, and a professional recommitment to patient-centered practice, the prospect of using emotional intelligence measures as a predictor of success or capacity to provide care is attractive. Some information can be garnered from educational research conducted by colleagues in medical and dental fields. However, prior to advocating research in this area, several issues must be addressed, including establishing a clear definition of emotional intelligence and assessing the validity and reliability of existing measurement instruments. If these limitations to studying emotional intelligence are eventually addressed, a new marker or modifiable factor that will allow colleges and schools of pharmacy to graduate students, and subsequently practitioners, with the skills and desire to engage in meaningful therapeutic relationships might be identified.

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