

Emotional Intelligence and Perceived Stress in Medical Education: A Questionnaire Based Survey among Medical & Dental Undergraduates

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ABSTRACT

Aim: To investigate the levels of EI and perceived stress (PS) among two groups of healthcare students (medical and dental) and examined their relationship.

Methods: A cross-sectional questionnaire survey was conducted among medical and dental undergraduates and interns at CMH Lahore Medical College and Institute of Dentistry to assess their levels of EI and PS. Participants were assessed on self-administered Sterrett's EI questionnaire and Perceived Stress Scale (PSS). The data collected from 627 participants was analyzed using SPSS version 24.

Results: Correlational analysis showed an inverse relationship between EI and PS among medical and dental undergraduates. Significant association was observed between level of EI and year of study for both the disciplines. Majority of the participants reported moderate levels of EI and PS.

Conclusion: EI can positively affect the students' ability to perform well under stressful situations in healthcare education. Undergraduate curriculum should be designed to focus on EI based education in order to enable healthcare students to cope well with the stress related to their clinical training.

Keywords: Emotional Intelligence, stress, medical education, medicine, dentistry

INTRODUCTION

Emotional Intelligence (EI) is a distinct form of intelligence which refers to a collective set of skills related to self-control, self-motivation and ability to recognize emotions^{1,2}. The concept of EI was defined by Salovey and Mayer as the capability of an individual to recognize and manage emotions in oneself and other individuals, and to utilize this information to guide one's activities, reasoning, and thinking³. It can be characterized as a cluster of skills and competencies which provide an individual the ability to encourage oneself regardless of hindrances, to deal with compulsion and disappointment and to be persistent and optimistic⁴. By involving skills such as motivation and determination, EI plays an important role in achieving goals and success. Recently EI has gained recognition as new aspect of intelligence which forms an important basis for professional success and contributes greatly to personal growth, mental health, and career development^{5,6}. It provides the ability to be more creative in problem solving and according to some studies, success in life and workplace depends more on EI as compared to intellect^{7,8}. EI is increasingly becoming relevant in healthcare disciplines as well, where it serves as an important factor for effective learning and practice^{9,10}. It has been suggested that EI can be a significant indicator of professional competence in the field of medical education¹¹ which has led to its recommendation as an important criterion for the selection of healthcare students¹². Beha-

vioural skills related to EI form a basic requirement for healthcare students and it has been suggested that good interpersonal skills and emotional competence are essential for healthcare students in order to effectively manage and promote their professional practice¹³. The clinical training in medical education demands working in challenging environments involving interpersonal work and good communication skills¹⁴. As a result, stress and workplace related anxiety are well documented phenomena among healthcare students^{15,16,17}. In this context several indicators of stress have been identified such as new learning environment¹⁸, financial security¹⁹, work load²⁰, academic requirements²¹ and learning of applied clinical skills²². Perceived stress (PS) is an individual's self-evaluation about his/her stress during a specific point or period of time. It is important for the students to be able to cope with this stress in order to maintain good mental health²³. Since emotional intelligence deals with the individual's ability to perceive, communicate, and use emotions effectively, it may be suggested that high level of emotional intelligence would be helpful to better manage stress during clinical training and consequently achieve more satisfactory patient outcomes.

The aim of this paper is to highlight the level of emotional intelligence among two healthcare student groups (medicine and dentistry) in all years of undergraduate curriculum including the interns and examines its relationship with perceived stress. We also attempt to investigate whether level of emotional intelligence varies among students in two different disciplines belonging to different years of study.

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MATERIALS AND METHODS

A cross-sectional survey was conducted at CMH Lahore Medical College and Institute of Dentistry from August 2020 to October 2020 in which medical (MBBS) and dental (BDS) undergraduates in all academic years of the curriculum and interns were invited to complete a questionnaire on EI and PS. Ethical approval was granted by the Ethical Review Committee, CMH Lahore Medical College and Institute of Dentistry.

A pilot study was conducted on 50 students of BDS 2nd year for reliability analysis. It was performed by calculating Cronbach's alpha for the 30-item Sterrett's EI questionnaire (N=***; alpha=0.89) and 10-item Perceived Stress Scale (N=***; alpha=0.77) using the data from all participants of the pilot study. The reliability of each scale was found to be adequate. After this, the sample size for actual study was calculated as 627. Simple random sampling technique was used for selection of participants of the study.

A three-sectioned questionnaire was used for data collection. A brief introduction of the study along with its aims was mentioned on the questionnaire for better understanding and more accurate response of the participants. Informed written consent was taken before collecting data. The first section consisted of demographic details (age, gender, discipline, academic year and status). The second section assessed the EI using Sterrett's EI questionnaire²⁴. It consists of 30 statements with 5 statements for each of the six domains of EI (self-awareness, self-confidence, self-control, empathy, motivation and social competency). The scoring criteria were based on five-point Likert scale from 'always Virtually' to 'never' Virtually'(1-5). The maximum and minimum total scores were 150 and 30 respectively. The third section assessed the PS using Perceived stress scale²⁵. This scale consists of 10 item questionnaire which is used to measure the PS of individuals relating to different situations. Individuals grade themselves on a 5 point Likert scale (0 = never to 4 = very often), with total score varying from 0 to 40, where a high total score indicates a higher level of perceived stress. Statistical analysis was carried out using SPSS version 24.

RESULTS

The gender distribution and age summary statistics of the participants is described in Table 1 and 2. Of 627 participants (308 from MBBS and 319 from BDS), 202 were males and 425 were females; all of them aged between 17 and 27 years.

Emotional Intelligence (EI): Disciplines were compared with respect to each domain of EI. The score of each domain was categorized in to four groups as shown in table 3. The percentages of participants falling in each group were calculated for both medical and dental students for comparison. Chi-square test of association was used which was statistically insignificant (p-value > 0.05) for all domains. When each domain was evaluated, a few participants scored above 20 while majority of the students obtained average scores (less than 20) in all domains. The same trend was noticed when overall score of EI was calculated with majority of the students falling in average category.

Comparison was also made with respect to the academic year. To check whether there exists some association between EI and academic year of study, chi-square test of association was used. For this purpose, the total EI score for all the six domains obtained by each student was considered. The overall frequency and percentage of students for each level of EI for different academic years were calculated as shown in table 4 (BDS) and table 5 (MBBS). The p-value for the chi-square test of association was statistically significant i.e. p-value < 0.05. It means that academic years and level of EI are significantly associated in both disciplines.

Perceived stress (PS): Disciplines were compared with respect to PS. Table 6 shows a comparative analysis of stress levels between the disciplines. The percentages were calculated within each discipline and grouped into low, moderate and high stress levels. Chi-square test of association was used which was statistically significant (p-value ≤ 0.05) representing that there is an association between the discipline and stress levels. In dentistry, 5.3% whereas in medicine 10.1% had low level of stress. More than half of the participants from dentistry (66.1%) and medicine (68.8%) reported experiencing moderate stress.

When comparing PS among different academic years, percentage of participants falling in different levels of stress was calculated, for each year of BDS and MBBS discipline (Table 7) Majority of the students from both disciplines reported moderate stress. In dentistry, maximum number of students from Year 2(45%) reported high stress. This was in contrast to medicine where maximum number of students from Year 5 (35%) reported high stress.

Correlation between EI and PS: To explore the relationship between EI and PS within each discipline, the Pearson's correlation coefficient was calculated between the PS and EI scores for each component separately. Then overall EI score that is the sum of all six components, was also calculated. For both disciplines, the overall correlation coefficient is quite low i.e., -0.084 for dentistry and -0.187 for the medicine students suggesting a weak relationship between perceived stress and emotional intelligence (Table 8). But for medicine students, this correlation is statistically significant with p-value 0.001. As far as the direction of relationship is concerned, it is inversed for both disciplines. It implies that as EI increases, PS decreases and vice versa. When we examine the correlation coefficients between perceived stress and each domain of EI, it is statistically significant for self-confidence, motivation, self-control, and social competency for the medicine students. Similarly for dentistry students relationship is statistically significant when we correlate stress with empathy and self-control.

Table 1: Age summary statistics

Discipline	N	Min.	Max.	Mean	St. deviation
BDS	319	18 years	27 years	21.66	1.774
MBBS	308	17 year	27 years	21.93	2.050

Table 2: Gender distribution

Discipline	Gender	Frequency (%)
BDS (319)	Male	86 (27%)
	Female	233 (73%)
MBBS (308)	Male	116 (38%)
	Female	192 (62%)

Table 3:

EI domains	Discipline	EI Levels				Chi square
		% of participants with score less than 10 (Very poor)	% of participants with score less than 15 (Poor)	% of participants with score less than 20 (Average)	% of participants with score above 20 (Good)	
Self-awareness	BDS	4 (1.3%)	51 (16%)	172 (53.9%)	92 (28.8%)	0.206
	MBBS	5 (1.6%)	50(16.2%)	142 (46.1%)	111 (36%)	
Empathy	BDS	0 (0%)	42 (13.2%)	152 (47.6%)	125 (39.2%)	0.141
	MBBS	5 (1.6%)	44 (14.3%)	143 (46.4%)	116 (37.7%)	
Self confidence	BDS	1 (0.3%)	61 (19.1%)	192 (60.2%)	65 (20.4%)	0.224
	MBBS	5 (1.6%)	47 (15.3%)	194 (63%)	62 (20.1%)	
Motivation	BDS	7 (2.2%)	58 (18.2%)	176 (55.2%)	78 (24.5%)	0.349
	MBBS	3 (1%)	61 (19.8%)	156 (50.6%)	88 (28.6%)	
Self-control	BDS	5 (1.6%)	82 (25.7%)	160 (50.2%)	72 (22.6%)	0.286
	MBBS	8 (2.6%)	63 (20.5%)	172 (55.8%)	65 (21.1%)	
Social competency	BDS	10 (3.1%)	84 (26.3%)	185 (58%)	40 (12.5%)	0.260
	MBBS	11 (3.6%)	87 (28.2%)	157 (51%)	53 (17.2%)	

Table 4: Emotional Intelligence levels (BDS)

Year	Very poor	Poor	Average	Good	Total
1 st Year	10(2.78%)	150 (41.67%)	175 (48.61%)	25 (6.93%)	360
2 nd Year	3 (0.68%)	77 (17.57%)	242 (55.25%)	116 (26.5%)	438
3 rd Year	6 (1.72%)	28 (8.05%)	205 (58.91%)	109(31.32%)	348
4 th Year	3 (0.68%)	54 (12.32%)	250 (57.07%)	131(29.92%)	438
5 th Year	5 (1.52%)	69 (20.91%)	165 (49.98%)	91 (27.58%)	330
Intern	5 (1.52%)	69 (20.91%)	165 (49.98%)	91 (27.58%)	330

Chi squar/P value 0.000*

Table 5: Emotional Intelligence levels (MBBS)

Year	Very poor	Poor	Average	Good	Total
1 st year	7 (2.54%)	37 (13.41%)	123 (44.57%)	109 (39.5%)	276
2 nd year	4 (0.93%)	100 (23.47%)	229 (53.76%)	93 (21.83%)	426
3 rd year	2 (0.95%)	45 (21.43%)	120 (57.15%)	43 (20.48%)	210
4 th year	5 (1.82%)	32 (11.6%)	145 (52.53%)	94 (34.05%)	276
5 th year	4 (1.67%)	30 (12.5%)	144 (60%)	62 (25.83%)	240
Interns	15(3.58%)	108 (25.71%)	203 (48.33%)	94 (22.38%)	420

Chi squar/P value 0.000*

Table 6: PS level

Class	Low stress	Moderate stress	High stress	Total
BDS	17 (5.3%)	211 (66.1%)	91 (28.5%)	319
MBBS	31 (10.1%)	212 (68.8%)	65 (21.1%)	308

Chi squar/P value 0.016*

Table 7: Perceived stress levels

Year	Low stress		Moderate stress		High stress	
	BDS	MBBS	BDS	MBBS	BDS	MBBS
1 st year	1.7%	19.6%	83.3%	52.2%	15%	28.3%
2 nd year	4.1%	9.9%	50.7%	67.6%	45.2%	22.5%
3 rd year	6.9%	0%	56.9%	80%	36.2%	20%
4 th year	12.3%	15.2%	68.5%	67.4%	19.2%	17.4%
5 th year	-	2.5%	-	62.5%	-	35%
Interns	0%	10%	74.5%	80%	25.5%	10%

Table 8: Pearson's correlation coefficient (p-value)

EI Components	BDS	MBBS
Self-awareness	-0.052 (0.357)	-0.040 (0.483)
Empathy	0.161 (0.004*)	-0.056 (0.331)
Self confidence	-0.049 (0.382)	-0.129 (0.024*)
Motivation	-0.084 (0.133)	-0.115 (0.043*)
Self-control	-0.248 (< .001*)	-0.249 (< .001*)
Social competency	-0.097 (0.085)	-0.257 (< .001*)
Overall EI score	-0.084 (0.135)	-0.187 (0.001*)

DISCUSSION

This study measures the level of EI and PS among medicine (MBBS) and dentistry (BDS) undergraduates and assessed their relationship. Differences in EI and PS scores between the two disciplines was evaluated and also compared year wise. An inverse relationship was identified between EI and PS indicating that higher EI is associated with lower PS among healthcare students which is consistent

with other researches^{2,9,18,26,27}. The finding forms an important aspect in healthcare education, since higher EI relates to better social behavior towards patients and results in improved patient care²⁸. In this context, it has been suggested that emotionally intelligent students and clinicians can better manage emotional challenges and therefore experience less stress providing better patient satisfaction^{9,29}. Our study evaluated EI of all the participants by assessing the six domains of EI. These include self-awareness (awareness about own feelings and preferences), self-confidence (ability to trust own judgment and skills), self-control (ability to control emotions and manage stress), empathy (understanding and sharing feelings of others), motivation (driving factor towards a goal), and social competency (ability to have positive relationship). Each domain was assessed for both disciplines and students were grouped according to the score. A few participants had scored good (above 20), while the majority of the them obtained average scores (16-20) followed by poor (11-15) and very poor (below 10). Our results show that majority of the students require assistance to improve their EI which is also consistent with the findings of other studies^{30,31}. The results can be related to some of the previous studies that have reported lower than average EI scores for healthcare students³². This implies that there is a need to implement and incorporate effective training during the undergraduate medical education to improve student's EI. This forms an important aspect of the undergraduate curriculum which should be focused around EI based education. Specifically, training in clinical years should be designed in such a manner so as to improve professionalism and communication

skills of future healthcare workers, since it has been suggested by numerous studies that an individual's EI strongly influences his ability to carry out safe and compassionate health care duties³³. Chi-square test of association was used which was statistically insignificant (p -value > 0.05) for all domains. This shows that there were no significant differences in EI scores between medicine and dentistry undergraduates and interns. The same finding has also been observed in earlier studies^{18,34}. Assuming that the students participating in our study share a similar academic background, it might be possible that students from medicine and dentistry have similar levels of EI.

In order to explore the association between level of emotional intelligence and academic year of study, the total EI score obtained by each student and intern was considered. The percentage and frequency of participants falling in each level of EI was calculated and compared year wise. The p -value for the chi-square test of association was significant, implying that the academic years and level of emotional intelligence are significantly associated in both disciplines. It was observed that as the students' progress from initial years towards their internship, their EI is expected to improve. Hence, it might be suggested that the current undergraduate curriculum and clinical training enables students to improve EI during the academic years.

Self reported perceived stress was evaluated for the two disciplines and students were grouped according to perceived stress levels. It was observed the majority of the students and interns from both the discipline reported moderate levels of stress. In our results, a higher number of students from dentistry reported high stress as compared to medicine. This is consistent with previous literature which suggests that dental students generally report higher levels of stress as compared to other disciplines^{35,36}. One possible reason, as suggested by Murphy et al, is that medicine students are more commonly supervised by senior practitioners while delivering patient treatment³⁶.

It was also observed that dental students from preclinical years were more likely to experience high stress during their undergraduate training. The finding was significant since this was in contrast to medicine discipline, where students from clinical years reported high stress. Several studies have reported relationship between PS and year of study among healthcare students with varying results. For example one study suggests that dental students in their clinical years (Year 3 to 5) report higher PS when compared to pre-clinical years (Year 1 and 2)⁹. However, another study conducted by Newton et al, observed that dental students in their initial years of study were more likely to experience stress³⁷. The literature in general however suggests that various clinical factors such as dealing with uncooperative patients and completing clinical requirements are strongly associated with higher PS in dental students³⁸. As a part of the undergraduate curriculum, Year 2 dental students participating in our study are required to complete their preclinical assignments and logbooks in addition to their basic sciences subject. It is likely that due to this reason dentistry students from preclinical years reported high stress in our study. Studies comprising medical undergraduates have also highlighted some important observations. It has been shown that the medicine students during their

transition from preclinical to clinical years were more likely to report high stress²⁰.

In our study, an inverse relationship was found between EI and PS scores, which supports the idea that higher EI is associated with less perceived stress and vice versa. Similar findings have also been reported in previous studies^{2,9,18}. The relationship was found to be weak for both the disciplines, however it was statistically significant for medicine students implying a strong relationship between EI and PS in medicine students. For dentistry students, a weak and non-significant relationship was observed which was consistent with a previous study¹³. These results suggest that dentistry students might be influenced by different variety of factors as compared to medicine students. This can be further explained by our finding that when individual domains of EI were correlated with PS, different factors were found relevant with both disciplines. For medicine students the relationship with PS was statistically significant for self-confidence, motivation, self-control, and social competency. Whereas, for dentistry students relationship was statistically significant when we correlate PS with empathy and self-control. In order to explain the difference observed between the two disciplines, further investigations are needed. Results from our study contribute to the evidence suggesting that low EI can affect the students ability to perform well under stressful environment in healthcare education. In the light of this evidence, it is suggested that various skills related to EI should be incorporated into the undergraduate curriculum in order to enable healthcare students to cope well with the stress related to clinical training.

Limitations: The study is a questionnaire-based survey used to observe EI and PS by self-reported assessment. Since the data was assessed based on a self reported scale, the results of the study are subject to response bias as students can tend to exaggerate their responses. Also due to the correlational nature of data analysis, our study is unable to suggest the direction of relationship between EI and PS. It may be possible that as students get stressed, their EI decrease, or conversely as EI scores decrease, stress increases.

CONCLUSION

The study examined the association between EI and PS among two different disciplines of healthcare students. No significant differences were found in EI levels between medicine and dentistry undergraduates. However significant association was observed between level of EI and year of study for both the disciplines. In terms of PS, majority of the participants reported moderate stress with dental students more likely to experience high stress in initial years of study. While our study suggests important link between EI and stress in healthcare education, further research work is required in order to explain the differences observed between the disciplines and to identify mechanisms by which various factors are associated in these groups.

Conflict of interest: Nil

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