



STUDY OF ROLE OF EMOTIONAL INTELLIGENCE AND INTELLIGENCE QUOTIENT IN ACADEMIC PERFORMANCE IN MBBS STUDENTS OF AIIMS PATNA

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ABSTRACT

Emotional Intelligence (EI) and Intelligent Quotient (IQ) are important in development of a medical student as a skilled and good doctor. This study takes into account factors that are ignored by IQ but included in EI. It also shows how EI can be enhanced through simple training exercises. This RCT study included 45 subjects. Following tools were used: Trait Emotional Intelligence Questionnaire to assess EI; A structured questionnaire derived from the IQ test.com for assessment of IQ; and score obtained in exams to assess the Academic performance. The variables were presented as mean and 95% of confidence interval. The relations of EI and IQ with academic performance show variable relation while their correlation coefficients are 0.166 and 0.1761 respectively. EI and IQ show negative correlation with the coefficient being -0.05423 (paired t test). Statistically significant increase in EI scores is observed after intervention. Thus it seems that exercises to improve EI have significant role in developing EI trait.

KEYWORDS : Emotional intelligence, Intelligent quotient, Emotions, Thought, Behaviour

1. INTRODUCTION:

Like in any other profession, medical profession also requires leaders who can lead their team and organization. To become a good leader many traits are required. Emotional intelligence and intelligence quotient are two of them which play very important role in overall development of an individual into a good leader.

Intelligence quotient is a system described for the assessment of human intelligence in which a score is derived using several standardized tests. It was so called by William Stern. First talked of in 1905 [1], It is found that two third population scores 85-115, while only 5% people scores >125 [2]. IQ depends upon various factors like morbidity, mortality, Parental social status and even genetic predisposition i.e., IQ of biological parents [3, 4, 5, 6, 7, 8]. However, the index IQ has various limitations and therefore being criticized these days as it fails to assess creativity, emotional development, dynamic and impending development, cultural makeup, which cannot be separated from broad intelligence.

Emotional intelligence (EI) is the ability of individuals to recognize self and other people's emotions, to classify and recognize different emotions and use this information in enacting their thoughts through their behaviour [2]. It is the ability or capacity to perceive, assess, and manage the emotions of one's self, and of others. This concept became popular by psychologist Daniel Goldman's book in 1995 but first time used in 1960s. Emotional Quotient (EQ), is how one measures Emotional Intelligence. Major components of EQ/EI are: 1) Self awareness that is the ability to understand own moods and emotions 2) Self management that is control over emotions 3) Social awareness that is the ability to develop rapport with new people and 4) Relationship management that is the ability to understand other's emotions and treat them as they wish to be treated.

- There are many benefits in developing EI as a skill -
- Individuals will have increased self-confidence, an increased willingness to speak their mind, an increased willingness to fight for right and a greater resilience to the challenges and changes they face in both their organizational and personal lives. [9]
- To organizations: Emotionally intelligent people are more confident, more motivated, more committed to the purpose of their organization and better able to apply their unique skills to

the tasks at hand. In addition to being more willing to share their creative ideas, emotionally intelligent people build better relationships both with colleagues and clients. [9]

- These improved social competence and quality relationships could enhance cognition and intellectual development leading to better academic performance [10-12]. In a more direct way, EI facilitates prioritizing of thoughts, behavior regulation and appropriately adapted lifestyle choices which facilitates academic performance [13]. Emotional intelligence, has also been related to clinical performance and higher academic achievement [14];
- In clinical practice, it has been related to improved empathy in medical consultation, doctor-patient relationships, clinical performance and patient satisfaction [15-18]. Patients need more than what a purely analytical doctor can offer. Recovery and therapeutic processes for patients could be more effective with a doctor who was communicating empathetically, ethically and competently [19, 20]. Demand for a physician who is genuinely interested in the health of patients, incorporating a patient's personal values and engaging with them in health decisions is only increasing in an ageing society, and one with more educated patients and higher standards of healthcare [21].

Although people with good IQ have been found to be more successful and efficient at professional front but still many with low IQ have huge success stories written against their names. This compels us to take into account other factors that are conventionally ignored by IQ but included in EI. Earlier it has not been checked if there is some direct or indirect relationship between the two parameters that are equally important in any individual's life (also medicos). It is also to throw some light on how Emotional intelligence can be enhanced through simple training exercises.

2. REVIEW OF LITERATURE

Intelligence Quotient

General intelligence is an accepted determinant of academic success on every level of the education system. Many studies found evidence for the positive effect of intelligence on school performance and higher education. Some research studies show a strong positive correlation between educational attainments and

'national IQs' calculated using various IQ tests[22].

Emotional intelligence

Emotional intelligence as defined by Daniel Goleman includes self-control, enthusiasm, persistence and self-motivation. These are abilities that can be developed and taught (Goleman, 1998).

Several studies confirm role of EI as a predictor of academic performance. However, few studies find no relation between I/Q and academic success.

A study with high school students showed scores on the EQ correlated with final grades after controlling for both personality and academic intelligence. Another study in Bangalore, India found that EI was significantly greater in females than males. Gender, sleep, meeting friends, physical exercise, recreational activities, and academic performance were significantly associated with EI [23]. Emotional intelligence (EI) is also related to professional success and contributes to individual cognitive-based performance over and above the level attributable to general intelligence [24]. There were more significant correlations between emotional intelligence score in form of MSCEIT (TOT, Area, Branch and Task) scores and the overall continuous assessment (CA) results than for the overall Final exam (FE) results [25].

3.Aims and objectives

Objectives:-

Objectives of the study are to find

1. If there is a significant relationship between Emotional intelligence and performance in exams in First year MBBS students of AIIMS Patna?
2. Is there a significant relationship between IQ and performance in exams in First year MBBS students of AIIMS Patna?
3. Do the students with higher Emotional intelligence outperform the students with higher IQs during the exams?
4. Can Emotional intelligence be increased by set of training workshops?

Aim:-

To find relation of EI and IQ and find simple training exercises which can increase Emotional intelligence of students with a view to make them better professionals and good leaders of their own field.

4.Methodology:-

The study was conducted in Department of Physiology at AIIMS Patna. It is a Randomised control trial. All consenting first year MBBS students of AIIMS Patna were included in the study. A total of 45 students completed the study.

A questionnaire of personal profile was administered which was to be completed in 10 minutes. The baseline demographic profile was made as per the following parameters for all the subjects name, age, sex, occupation, address, telephone number, email id, religion. Apart from these, height, weight, information about the attempts they took to qualify the MBBS Entrance examination, birth order among the siblings, were also recorded.

Following tools were used:-

1. Trait Emotional Intelligence Questionnaire – Short Form to assess EI.
2. A structured questionnaire derived from the I Q test.com for assessment of IQ

Protocol for tests:-

Baseline Emotional Intelligence and Intelligent Quotient were measured as per below mentioned protocol.

Emotional intelligence test: - After explaining the procedure and giving necessary instructions to all the subjects, they were administered Trait Emotional Intelligence Questionnaire – Short

Form test which consists of 30 questions. Subjects had to complete this test within 30 minutes. A Likert scale ranging from 1 (completely disagree) to 7 (completely agree) is used for the responses to the test items. The TEIQue is widely used and validated cross culturally. Cooper and Petrides indicated that the four higher level factors of the TEIQue (Well-Being, Self Control, Emotionality, Sociability) can be assessed using the TEIQue-SF. The TEIQue is suitable for the rapid assessment of global trait EI. An EI score for each participant was calculated by summing up the item scores. Global Trait EI (average item score) was also calculated by dividing this by the total number of items.

For Intelligence quotient test: - After explaining the procedure and giving necessary instructions each subject took IQ test. A structured questionnaire consisting of 38 items derived from the IQ test.com was administered to them. Time taken by each individual to complete this questionnaire was recorded. IQ scores were calculated by multiplying number of correct responses by 3 and adding necessary value according to time taken to complete the test as per the following table.

Time scoring	Marks score	Intelligence interval	Cognitive designation
>30 min than 5marks	Each question carries 3 marks. Maximum marks 3x38=114	40-54	Severely challenged
25-30 min-10marks		55-69	Challenged
20 -25min-15 marks		70-84	Below average
15-20min-20 marks		85-114	Average
11-13min.-45marks		115-129	Above average
<11 min-60marks-		130-144 145-159	Gifted Genius
Maximum possible total score: 60+114=174		160-175	Extraordinary genius

Performance of subjects was assessed based on the percentage of aggregate marks obtained in Anatomy, Physiology and Biochemistry by students during pre university examination.

The scores obtained in the above tests were noted down but not disclosed to the subjects. Now the subjects were divided into four groups: A, B and C and D by random table method. Then group A, B and C underwent a series of three training workshops continuously for three weeks while group D acted as control. Group A underwent training on Tuesday, B on Thursday while C took training on Saturdays of each week. After completing the training, we again assessed EI and IQ of all the subjects by previously used assessment tools.

Description of training sessions with objectified expected outcomes is discussed in a step wise fashion.

Workshop 1

1.Learn to support each other (total duration one hour).

Step1: The group formed a circle by holding their hands.

Step2: A person was chosen from the group and told to step forward while others reformed the circle.

Step3: Person in the middle walked with his eyes blind folded. He was first passively given few turns at the spot, and then made to take any direction he wanted at any time but made to walk only straight ahead.

Step3: The circle was responsible for making sure that the person walking was supported, safe, and taken care of such that his walking is not interrupted nor touched the periphery of the circle. Also the circular formation was never to be breached at any point and the

circle should have produced no sound at all. This is to be maintained for one minute.

Step4: Each participant took a turn which changed every minute.

Workshop 2:-

1.How good listener you are (total duration one hour).

Step1:The group members were made to sit in a circle. The pre-chosen topic was projected by coordinator of the group. Any two people were commanded {better they come on their own or chosen by coordinator} to step ahead and stand in middle of circle who had opposite notion about the topic.

Step 2:Two partners faced each other. Each partner shared opinion, one sentence at a time **without relating to the other person**, e.g.

Partner 1: Shopping malls have everything you need in one place.
 Partner 2: Shopping malls are energy hogs.
 Partner 1: If I want to buy grocery, or home utilities or my kids need something, it's all right there.
 Partner 2: They waste space and are bad for the environment.
 This continued for 1 minute. The partners were supposed to speak continuously without any pause.
 Step 3: This time each partner shared opinion, one sentence at a time, and the partner responded by paraphrasing the sentence

without using any of the same words, starting with "So what you're saying is..." example:-

Partner 1: Some of my best memories with my kids have taken place in shopping malls.
 Partner 2: So what you're saying is that there are happy times you like to think about and that many of them occurred in places where stores are all inside one big building surrounding by a huge parking lot.

Partner 1 says "yes, that's what I said," then partner 2 shared a sentence and partner 1 paraphrased. Otherwise person 2 had to repeat again until person one was satisfied. No more than 2 chances were given. This was repeated with some new topic and new team members.

Questions for processing this exercise:

Following questions were asked at the end one by one and the group members were to respond

- What was it like to try to listen to someone else at the same time as you were talking?
- Can you think of times when you are trying to listen to another person while your own thoughts are racing?
- What was it like to share without your partner responding to what you said?
- What was it like to paraphrase what your partner said?
- What gets in the way of representing what the person was saying? Were you aware of your own bias, judgments or perceptions interfering with simply re-stating their point?

Workshop 3:-

2.Working as a team {duration 20+30+45 minutes}
 Four signs were created – North, South, East and West – and posted on different room walls before beginning. Enough newsprint-size paper and markers for each of the four groups were ensured. Under each point, traits associated with each sign were written, as directed by the Compass Points game:
North: (Action) – “Let’s do it;” Likes to act, try things, plunge in.
East: Speculating – likes to look at the big picture and the possibilities before taking action.
West:Caring – likes to know that everyone’s feelings have been taken into consideration and that their voices have been heard before taking action.
South: Paying attention to detail —likes to know the who, what, when, where and why before acting.

Step1: Introduced the participants into the room, and did warm up
 Step 2: Everyone’s attention was drawn to the four compass points posted around the room. They were asked to read each one and then select the one that most accurately captured how they work with others on teams. They were made to stand at that point and remain there throughout the activity. Once everyone had decided, participants observed who has ended up in which group.

Step3: Next, ask each group to select individuals for the following roles:
 Recorder– records responses of the group
 Timekeeper – keeps the group members on task
 Spokesperson — shares out on behalf of the group when time is called

Step4: Each group had 5-8 minutes to respond to the following questions:

1. What are the strengths of your style? (3-4 adjectives)
2. What are the limitations of your style? (3-4 adjectives)
3. What style do you find most difficult to work with and why?
4. What do people from other “directions” or styles need to know about you so you can work together effectively?
5. What’s one thing you value about each of the other three styles?

Step5: once they were done, time was provided for group members to share out their responses via spokesperson. Every other group would listen to the group speaking. This was done one by one with each group.

Step6: Finally, in 2 minutes at the end of the activity, takeaways key were shared:
 Has this activity increased our awareness of our own and others' preferences?
 Increased awareness opens the door to empathy

Our preferences have their strengths and their limitations
 A diversity of preferences is what makes for better team work and results

Step 7: The participants were reorganized into original groups. And actual teamwork activity was done to imbibe and enact the previous learnings.

Step8: when this was over, the group activity experience of the members and guide was discussed.

Data Analysis: - All descriptive variables are presented as mean and 95% of confidence interval. Internal reliability is checked through Cronbach’s alpha. Comparison of EI and IQ with performance is done by using correlation coefficient. Improvement in EI of subjects before and after intervention is seen by paired t- test using SPSS version 20.

Parameter	Mean (n=45)	SD (n=45)
Age	19.44	0.98
Height (in centimeters)	164.84	10.18
Weight (in kilograms)	59.91	11.40
Performance (total score 300)	238.15	24.73

7.OBSERVATION AND RESULT

As mentioned earlier the data analysis of only 45 subjects is done although the study was started with a whole of 78 consenting subjects but they backed out at various steps of study. Hence there are only 45 subjects who underwent all the tests and the interventions.

Table 1 Profile of subjects who completed all the interventions

The mean age of subjects in the study is 19 years. Their mean height (in cm) and weight (in kgs) is 164.84 cm and 59.91 kgs respectively. On an average their performance as in the terminal examinations was 238.16 marks out of total 300 marks.

Table 2 Reliability (Cronbach's alpha) of Global trait EI and 4 factors of the TEIQue-SF

Variables (items)	Pre Workshop		Post Workshop	
	Mean/SD	α	Mean/SD	α
Global trait EI (30)	4.74 (1.85)	.871	5.02 (1.77)	.891

Well-being (6)	5.07 (.27)	.689	4.58 (.12)	.456
Self-control (6)	4.45 (.17)	.543	4.51 (.24)	.661
Emotionality (8)	4.76 (.19)	.655	4.81 (.20)	.670
Sociability (6)	4.52 (.23)	.651	4.62 (.27)	.686

Internal reliability was high for total EI ($\alpha = .89$). Those for the 4 factors were acceptable.

Table 3 Mean total scores of EI and average of EI at pre and post workshop and follow up

Group	Pre-WS M (SD) Global trait EI	Post-WS M (SD) Global trait EI	P-value (Repeated M)
Total (n=45)	143.69 (18.82) 4.79	150.45 (20.35) 5.02	0.034
Male (n=19)	144.33 (21.34) 4.81	146.83 (21.23) 4.89	Ns
Female (n=26)	143.19 (16.97) 4.77	153.26 (19.52) 5.12	0.007

Mean total score of EI is 143.69 ± 18.82 and 150.45 ± 20.35 pre and post workshop, while average is 4.79 and 5.02 pre and post workshop for all.

Table 4 Correlation of EI and IQ with Performance and with each other

Parameter	Pearson correlation coefficient (r)	95% confidence interval
EI vs performance	0.166	-0.134 to 0.4382
EI vs IQ	-0.05423	-0.0101 to -0.783
IQ vs performance	0.1761	-0.1238 to 0.4466

For these the pre-interventional values of EI and IQ were used. The relations between the EI and IQ with academic performance of the subject's shows variable relation while their correlation coefficient being 0.166 and 0.1761 respectively. EI and IQ shows a negative correlation with the coefficient being -0.05423.

Figure 1

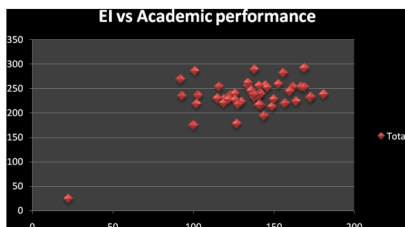


Figure1:graph showing the variation of Total marks obtained in internal assessments as an indicator of academic performance (y axis) with the Emotional Intelligence EI scores(xaxis)

Figure 2

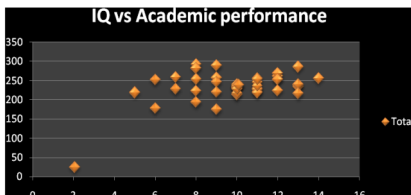


Figure2: graph showing the variation of Total marks obtained in internal assessments as an indicator of academic performance (y axis) with the Intelligence quotient IQ scores out of 20 (xaxis)

Table 5 Paired t test comparing pre intervention and post intervention scores

Variables	Pre test (Mean ± SD)	Post Test (Mean ± SD)	p Value
Intelligent Quotient (IQ)	10.09 ± 2.05	10.31 ± 3.04	0.492
Emotional intelligence (EI)	137.4889 ± 22.34738	142.18 ± 20.27	0.018

P<0.05

This table shows there is negligible improvement in IQ scores after the three interventions but clearly, statistically significant increase in EI scores is observed after the intervention. On further analysis it was found that out of 45 subjects 13 students post intervention EI scores were marginally lower than their pre-test scores rest all subjects shows significant improvement in their scores emphasizing the importance of these kind of exercises in improving EI.

7.DISCUSSIONS

Emotional intelligence has a weak positive correlation with performance ($r=0.166$) with 95% confidence interval being -0.134 to 0.4382. An earlier study on first and final year medical students revealed $r=0.24$ between EI and Academic performance during continuous assessment while $r=0.21$ when EI and Final exam performance were correlated. [25] The findings of earlier researches about the effect of EI on performance are controversial among themselves, some authors saying it to have no significant relationship with academic success, while others got it to be significantly positively related as in a study in Bangalore by Kumar A [23] or modestly positively related. The findings of our study show weak positive correlation.

Intelligence quotient has a weak positive correlation with performance ($r=0.1761$) and we got a wide range of 95% confidence interval i.e. -0.1238 to 0.4466, hence it could be called a variable relationship. Earlier the studies that accounted for relation of IQ with academic performance stated that national IQs had (attenuation corrected) correlations of between 0.92 and 1.00 with scores in math (10 year olds in 25 countries) and science (14 year olds in 46 countries). [22] This deviation may be due to differences in the sample size and also the difference in the mean age of the populations under consideration. Moreover education system and assessment modalities vary from country to country. Few other researches had also found IQ to have a significant positive correlation to the academic success.

One more finding in the present study is a negative correlation between EI and IQ scores of the subjects which is difficult to explain though this may be due to the fact that domains as well as facets of both the traits are mutually not so inclusive. And thus personal variation over these domains may render someone to be very good at handling emotions while not so good at intellectual abilities. Further this requires to get reinvestigated with a bigger data base to comment conclusively.

The change in the EI values taken after the intervention was statistically significant from the former EI values ($p=0.01$). Thus the emotional intelligence can be improved using some exercises that focus on its various facets. It goes along well with previous study that said it could be developed and taught.

Contrary to EI there was not a statistically significant improvement in the IQ scores post intervention as compared to IQ scores before the intervention ($p=0.49$), this tells us that those activities that focus on improving the EI has limited effect on IQ of the subjects. This indicates that the parameters like group cohesion, an experience of disorientation, skills of attentive listening and responding without judgement, empathy, awareness of preferences, etc that were focussed during the intervention had a strong positive impact on EI trait and lesser role in the IQ trait of an individual.

8.CONCLUSION

Our study focussed on investigating the relationship between Emotional Intelligence and Intelligence quotient, overall academic performance and effect of intervention programmes over them. The results of the study show that though both IQ and EI are reasonably good predictors of academic performance, they are not the exclusive indicators of good performance at the medical academics probably because the determinants of performance in medical students are multifactorial and having great individual variations. Another observable finding of the study is the effects of the EI

focussing interventions on the trait EI that are quite significant and show a reasonable improvement. While the intervention came out to be of no significant effect on IQ scores. Thus it seems exercises/interventions to improve EI having significant role in the developing the EI trait of medical students.

9.SUGGESTIONS

The study suggests that adding activity based training of the two traits could be thought of and further researched, so as to decide if it should be given a place in medical curriculum. Furthermore, a study with bigger database is suggested for a more conclusive finding on the subject.

10.SUMMARY

Both EI and IQ are equally important in development of a medical student into a skilled and 'good' doctor. But the question whether medicos have equally well EI and IQ is an area of doubt. Hence a study was conducted in Department of Physiology at AIIMS Patna to record and analyse the EI and IQ of the medical students studying at the institute. Also an attempt was made to work upon the trait EI of the students which showed significant result and after the intervention significant increase in their EI was recorded. Intervention did not affect the IQ of the subjects significantly. Analysis also showed the positive correlation of EI and IQ with the academic performances of the students. The EI and IQ of the subjects in the study were found to be negatively correlated. Further study that could take into account the effect of both traits on the clinical performance of students should be done to get a wholesome idea of their impact in making of a medical graduate.

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