ORIGINAL ARTICLE

The Level of Emotional Intelligence in Medical Imaging Students

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ABSTRACT

Introduction: Emotional intelligence (EI) is a crucial skill that aids students on how to cope with challenging nature of the academic. Emotionally intelligent persons are emotionally, spiritually, intellectually, and physically balanced. This study is aimed to evaluate the average level of EI in medical imaging students whether it is significantly different from the EI value set at 2.5 (high level of emotional intelligence). **Methods:** This cross-sectional study used the adopted Emotional Intelligence Scale (EIS) questionnaire. Purposive sampling method was conducted on 89 medical imaging students. The data was analyzed using SPSS version 26. One sample T-test and Pearson correlation test were conducted with the significant p-values were set at <0.05. **Results: :** The results showed that the medical imaging students' EI overall mean score was 3.84 (SD:0.38) with p-value of <0.001. There were also significant p-values of <0.001 for all 10 sub-dimensions of EIS. However, there is no significant correlation was found between level of emotional intelligence and year of study of the respondents 0.69 (r-value:-0.043). Significant high level of EI in medical imaging students could plausibly cause the students to have the ability to perceive themselves as efficient, enthusiastic, cheerful, satisfied, and always tend to stay optimistic in life, have greater self-control, able to endure pressure and manage tension, and are conscientious. **Conclusion:** High emotional intelligence students were predicted to be more poised for success in the future healthcare professions and industries.
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INTRODUCTION

Academic performance amongst the students in learning institutions have been a concern to stakeholders by several contributing factors. Numerous factors revealed by tons of research, for instance student's Intelligence Quotient (IQ), personality, social economic status, relationship between peers, motivation, rapport between the student and teachers, and parental involvement. In many instances, IQ had been used as a determining factor and attributed to academic success, out of all the factors suggested (1). Nevertheless, numerous emerging studies proved that academic success or failure is weakly predicted by IQ (2).

Thus, various researchers interested to know other contributing factors to academic performance, especially on how the emotional intelligence (EI) would help students in increasing academic performance. In 1996, Goleman asserted that IQ could be attributed to only 20 per cent of a person's success. By expecting the rest of 80 per cent of the achievement could be contributed by other factors. In determining the success of a person, emotional intelligence (EI) can be "as powerful, and at times more powerful, than IQ". Goleman's claim of success in the future can be predicted by EI has awakened the academic community. This assertion was written in his book (3).

Consecutively, EI has been popularly discussed in various fields of research, such as in psychological research, medical education, and management (4 –6). Salovey and Mayer (1990) has been formally defined EI as the "ability to monitor one's own and others' emotions, to

discriminate among them, and to use the information to guide one's thinking and actions". Many studies have discovered the positive relationship between the level of EI and academic performance (1,6–8).

An emotionally intelligent person is emotionally, spiritually, intellectually, and physically balanced. Thus, they will become more successful than individual who solely high level of IQ (8). Many countries had then researched the impact of EI towards academic performance (9). Studies investigating the connection between EI and academic success yielded mixed findings (10). EI benefits individuals excel across the transition of life, which is from school to college, and followed with the working environment. EI is then realized as a crucial skill that aids students on how to cope with the challenging nature of the academic in college level such as being able to confront their challenging college life. Besides, persons can concentrate on learning and perform academically when they are capable to lead their life to be successful in an academic environment (1) .

High level of EI is definitely can benefit those who want to commence into a profession that necessitate emotional competence such as healthcare professionals. Healthcare profession most of the times deal with interactions and patient care and therefore it requires personnel to be emotionally intelligent (11) to adapt with challenging work nature. Increasing EI in healthcare field suggested improvement in application to work performance, patient compassion and career selection (12).

Therefore, this study aims to evaluate the level of emotional intelligence among the medical imaging students in the Department of Diagnostic Imaging and Radiotherapy, Kulliyyah of Allied Health Sciences, International Islamic University Malaysia, whether it is significantly different from the EI value set at 2.5, indicated as high level of emotional intelligence (13). The medical imaging students are among those who will join the health care professions and workforce in the future, specifically as a medical imaging practitioner, radiographer or a radiologic technologist in various clinical settings, requires a high level of emotional intelligence to become more successful than those who solely have high level of IQ.

MATERIALS AND METHODS

Study design and setting
This study is a cross-sectional study. This research was conducted in the Department of Diagnostic Imaging and Radiotherapy, Kulliyyah of Allied Health Sciences, International Islamic University Malaysia. The total number of students for the Bachelor of Medical Imaging students in the Kulliyyah of Allied Health Sciences were 95 students. The inclusion criteria were students enrolled in the Bachelor of Medical Imaging and consented to be part of the study. While the exclusion criteria were students for other bachelor programmes in the Kulliyyah or University and unable to be consented to be part of the study. A purposive sampling method was used in this study in which a non-probability sampling was selected based on characteristics of a population and the objective of the study. Hence, 89 students out of 95 total number of students who were eligible, consented and responded to the study consists of students from year 1 until year 4 of study; 17 students, 21 students, 25 students, 26 students respectively.

Research tools
The questionnaire was adopted from the Emotional Intelligence Scale (EIS) by Hyde, Pethe, and Dhar (2002) with an additional part for the demographic data of the respondent to be meaningful for the current research. The Cronbach alpha reliability coefficient was found at 0.88 and content validity was 0.93 which indicated that the adopted EIS scale has high reliability and content validity. The validated questionnaires were composed of two parts: part A and part B.

Part A composed of demographic data of the respondents, such as matric number, gender, age and year of study. While part B employed a self-report measure that ascertained the respondent's level of emotional intelligence, was adopted from the Emotional Intelligence Scale (EIS) by Hyde, Pethe, and Dhar (2002) (13). A five-point Likert scale was utilized to rate the score; strongly agree (5), agree (4), undecided (3), disagree (2), and strongly disagree (1).

Part B was composed of 34 items under 10 sub-dimensions according to table I, which were integrity (3 items) was evaluated by question number 16, 27 and 32, commitment was evaluated by question number 23 and 24 (2 items), self-development was evaluated by question number 30 and 33 (2 items), self-motivation was evaluated by question number 2, 4, 7, 8, 31 and 34 (6 items), value orientation was evaluated by question number 21 and 22 (2 items), self- awareness was evaluated by question number 6, 12, 18 and 29 (4 items), emotional stability was evaluated by question number 14,19,26 and 28 (4 items), empathy was evaluated by question number 9, 10, 15, 20 and 25 (5 items), altruistic behaviour was evaluated by question number 3 and 13 (2 items) and managing relations was evaluated by question number 1, 5, 11 and 17 (4 items).

Data collection
The questionnaire was distributed to all medical imaging students in the Department of Diagnostic Imaging and Radiotherapy, Kulliyyah of Allied Health Sciences, International Islamic University Malaysia via the online platform (Google Form). Data was collected from the participants through the questionnaire that was responded by 89 students out of 95 total number

Table I: Emotional Intelligence Scale (EIS)(13)

Ques-tion No.	Statements
1	I can encourage others to work even when things are not favorable.
2	People tell me that I am an inspiration for them.
3	I am able to encourage people to take initiative.
4	I am able to make intelligent decisions using a healthy balance of emotions and reason
5	I do not depend on others encouragement to do my work well.
6	I can continue to do what I believe in, even under severe criticism.
7	I am able to assess the situation and then behave.
8	I can concentrate on the task at hand in spite of disturbances.
9	I can give attention to the worries and concerns of others.
10	I can listen to someone without the urge to say something.
11	I can perceive as friendly and outgoing.
12	I have my priorities clear.
13	I can handle conflicts around me.
14	I do not mix unnecessary emotions with issues at hand.
15	I try to see the other person's point of view.
16	I can stand up for my beliefs.
17	I can see the brighter side of my situation.
18	I believe in myself.
19	I am able to say composed in both good and bad situations
20	I am able to say focused even under pressure.
21	I am able to maintain the standards of honesty and integrity.
22	I am able to confront unethical actions of others.
23	I am able to meet commitments and keep promises.
24	I am organized and careful in my work.
25	I am able to handle multiple demands.
26	I am comfortable and open to novel ideas and new information.
27	I am ready to take my responsibilities and fulfill the tasks which is being expected of me.
28	I am persistent in pursing goals despite obstacles and setbacks.
29	I have built rapport and made and maintained personal friendships with work association.
30	I am able to identity and separate my emotions.
31	I think that feelings should be managed.
32	I am aware of my weakness.
33	I feel that I must develop myself even when my job dose not demand.
34	I believe that happiness is a positive attitude.

of students. Response rate was 93% which indicated a high response rate. Prior to the respondents embarked the survey, the respondents were required to read the research information and consented on the declaration section. Only consented responses were recorded in this study.

Data analysis

To calculate the total score of the emotional intelligence scale, the mean score for each of the sub-measurements were summed and their mean was calculated. Total score for 34 items based on five-point Likert scale yielded 170 points. Hence the respondents who obtained at least half from the total score, which is 85 points and above with the mean of 2.5 is considered as high level of emotional intelligence. Respondents who obtained 55 to 85 points with mean of 1.62 to 2.5 is considered as moderate level of emotional intelligence level of emotional intelligence. While respondents who got 55 points and below with mean of 1.62 is considered as low level of emotional intelligence (13).

Data collected were transferred to the Statistical Package for Social Sciences (SPSS) version 26. Descriptive statistics were used to describe the demographic background of the respondents and determine the level of emotional intelligence among the respondents. The results were presented in percentage, mean and standard deviation. Normality test was conducted and the data shown as normally distributed. Therefore, the parametric statistical tests were used. To compare the mean difference in the level of EI of the respondents with the test value 2.5, One Sample T-test was used. The p-value was set at level of <0.05 to be significant. While a Pearson correlation test was conducted to test the relationship between the EI level and year of study of the respondents. The p-value was set at level of <0.05 to be significant.

Ethical considerations

The study received the ethical approval from the Kulliyyah Postgraduate and Research Committee (KPGRC) and IIUM Research Ethics Committee (IREC) with reference number IREC-2020-KAHS (DDIR)-14.

RESULT

Demographic data in this study include the gender, age and year of study. Table II shows the distribution and the percentage of respondents according to gender, age and year of study. It illustrated that there were 18 (20.2%) male students and 71 (79.8) female students. One (1.11%) of them was 19 years old, 15 (69.8%) were 20 years old, 18 (20.2%) were 21 years old, 11 (12.4%) were 22 years old, 20 (22.5%) were 23 years old, and

Table II: Distribution and percentage of respondents according to gender, age and year of study (n=89)

Demographic characteristic		Frequency	Percentage (%)
Gender	Male	18	20.2
	Female	71	79.8
Age	19	1	1.1
	20	15	16.9
	21	18	20.2
	22	11	12.4
	23	20	22.5
	24	24	27.0
Year of study	1	17	19.1
	2	21	23.6
	3	25	28.1
	4	26	29.

24 (27.0%) of them were at the age of 24. Seventeen (19.1%), 21 (23.6%), 25 (28.1%), 26 (29.2) of them were from the year 1, 2, 3, and 4 respectively.

Table III represents the overall level emotional intelligence of the respondents. With the overall mean score of 3.84 and standard deviation of 0.38, this indicates that the respondents have a high level of emotional intelligence. The P-value showed a statistically significant (P<0.001) between means in the overall level emotional intelligence of the respondents.

Table III: Level emotional intelligence of the respondents (n=89)

	95% Confidence Interval		t	df	Mean	Standard deviation	P-Value
	Lower	Upper					
Emotional Intelligence	1.26	1.42	33.64	88	3.84	0.38	<0.001*

Note: *Shows statistically significant.

Table IV shows the relationship of the emotional intelligence level and year of study of the respondents. There was no significant correlation was found between the level of emotional intelligence and year of study of the respondents with P-value 0.69, and correlation coefficient, r-value of -0.043. The strength of the relationship showed a weak negative correlation.

Table IV: Correlation of emotional intelligence level and year of study of the respondents (n=89)

	n	r-value	P-Value
Pearson correlation	89	-0.043	0.69

Table V shows the level of each sub-measurement of the emotional intelligence scale. Based on the table, the students were found to have "above average emotional intelligence" or high level of emotional intelligence for all sub-dimensions. Subdimension of emotional intelligent that was rated the highest is integrity 4.10 (0.53), followed by commitment 3.99 (0.67), self-development 3.98 (0.56), self-motivation 3.89 (0.43), value orientation 3.84 (0.59), self-awareness 3.83 (0.62), emotional stability 3.78 (0.51), empathy 3.76 (0.52), altruistic behaviour 3.68 (0.65) and managing relations 3.67 (0.51). The P-values showed statistically significant (P<0.001) between means in each sub-measurement of emotional intelligence scale of the respondents.

Table V: Level of the 10 sub-dimensions of emotional intelligence scale (n=89).

Sub-dimension	95% Confidence Interval		t	df	Mean	Standard deviation	P-Value
	Lower	Upper					
Self-awareness	1.20	1.46	20.41	88	3.83	0.62	<0.001*
Emotional stability	1.17	1.39	23.82	88	3.78	0.51	<0.001*
Empathy	1.15	1.37	22.70	88	3.76	0.52	<0.001*
Managing relations	1.06	1.28	21.64	88	3.67	0.51	<0.001*
Integrity	1.48	1.71	28.66	88	4.10	0.53	<0.001*
Self-motivation	1.30	1.48	30.91	88	3.89	0.43	<0.001*
Commitment	1.35	1.63	20.97	88	3.99	0.67	<0.001*
Self-development	1.36	1.60	24.96	88	3.98	0.56	<0.001*
Value orientation	1.21	1.47	21.41	88	3.84	0.59	<0.001*
Altruistic behaviour	1.04	1.31	17.07	88	3.68	0.65	<0.001*

Note: *Shows statistically significant.

DISCUSSION

This finding in this current study is comparable with the finding from Suleman et al. (2019) that was done in Pakistan that apply the same tool in measuring the level of emotional intelligence, the respondents that consist of undergraduate students were found to have a high emotional intelligence inclusively and with all the ten subdimensions of emotional intelligence.

The level of emotional intelligence of the respondents

was measured by summing the mean score from each of the ten sub-measurements and calculate their mean. The scores that can be obtained were varied from a minimum score of 34 to a maximum score of 170, where the higher scores denoted a higher level of emotional intelligence (13-14). The respondents who acquired total score of more than 85 with the mean score of 2.5, below 55 with the mean score of 1.62, and in between 55 and 85 with the mean score between 1.62 to 2.5 are considered as "Emotionally Intelligence above average" (high level of emotional intelligence), "Emotionally Intelligent Below Average" (moderate level of emotional intelligence) and "Average Emotionally Intelligent" (low level of emotional intelligence), respectively. This is according to the manual of emotional intelligence (6). Results shown for this current study that the medical imaging students have a high level of emotional intelligence where all of them got the total score above 85 with the mean score was above 2.5. They are also having a high level of emotional intelligence for all sub-dimensions.

This current study also shown the similar result and that the medical imaging students of IIUM, Malaysia have an overall high level of emotional intelligence (EI), and subsequently a high level in all the ten subdimensions of the EI, namely self-awareness, emotional stability, empathy, managing relations, integrity, self-motivations, commitment, self-development, value orientation and altruistic behaviour. The result also shown a significant difference in the level of EI with the year of study of the medical imaging students in IIUM, Malaysia that could anticipate a progressive improvement in the level of EI between the years of studies of the medical imaging students. For the result to be relevant in the Malaysia context, Mohzan et al. (2013) also claimed that their respondents which consist of the students from the Faculty of Education, UiTM Shah Alam have a high level of emotional intelligence generally for all the domains investigated. Thus, this can be viewed that the EI results for medical imaging students at International Islamic University Malaysia are in parallel with outcomes gathered from different universities, both local and international.

As nowadays, the importance of emotional intelligence is continually acknowledged and measured through various careers. Managing emotions within the social settings is obviously necessary for success in both interpersonal and career-related domains. Empathy is an especially significant component of emotional intelligence and for years, scholars have recognized that, and it leads to excellent performance in the workplace (10). A good deal of our achievements and failures in life are not due to our cognitive abilities as assessed by IQ tests, but rather to our ability to form and maintain social relationships, to represent ourselves favourably and to influence how others view us (15). As stated in the National Education Philosophy (NEP) by the Ministry of Education Malaysia "Education in Malaysia is an on-

going effort towards further developing the potential of individuals in a holistic and integrated manner, so as to produce individuals who are intellectually, spiritually, emotionally and physically balanced and harmonious, based on a firm belief and devotion to God. " (16). This requires the continuous effort on the measurement of EI among the students by the educators regardless their educational levels or majoring field.

Since the medical imaging students demonstrated high level of emotional intelligence in general and high emotional intelligence for all the sub-dimensions, it is expected for them to have the ability to perceive themselves as highlighted by Mackay et al., (2012) to be efficient, enthusiastic, cheerful, satisfied, always tend to stay optimistic in life, have greater self-control so that they can better control their emotions, able to endure pressure and manage tension, and are conscientious. Conclusively, this will become a surplus for students to survive later in their careers. However, there was no relationship was found between the level of emotional intelligence and year of study of the respondents. This shows that the students have a comparable EI levels throughout the years of study, regardless which year they are in.

There were several limitations to the study due to the scope of the study that was only premeditated to study the emotional intelligence of medical imaging students in the Department of Diagnostic Imaging and Radiotherapy, Kulliyyah of Allied Health Sciences, International Islamic University Malaysia, hence incapable for overall generalization of the emotional intelligence of students in the institution as a whole. Moreover, a more significant result could be obtained by increasing the number of participants or a larger sample size.

CONCLUSION

The study used the adopted Emotional Intelligence Scale (EIS) which was convenient to identify the level of emotional intelligence among the medical imaging students. The finding from this study reveals that the medical imaging students from the Department of Diagnostic Imaging and Radiotherapy in the Kulliyyah of Allied Health Sciences, International Islamic University Malaysia, have a high level of emotional intelligence and it is significant with the year of studies. They were also considered to be emotionally intelligent with regards to all emotional intelligence subdimensions. Since the medical imaging students are the future healthcare provider, it is important for them to become a person of emotionally intelligent. Particularly, in managing their emotional intelligence to improve and harmonize the relationship with the patient, colleagues, and public.

In the perspective of education, the special curriculum should be developed, aside from the professional taught

courses in the medical imaging field, which were the requirements set by most of the accreditation bodies to the high education provider. The emotional intelligence subject is deemed to be an important subject to be taught in the medical imaging curriculum to give the students a comprehensive knowledge on the concept of emotional intelligence and perhaps the students can be benefited in utilizing their emotional intelligence in life beyond the university life. Indirectly, the medical imaging students might possibly more poised for success when they enter the healthcare profession and industries were predicted by the high emotional intelligence they owned at present.

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