Effect of Emotional Intelligence on Performance in Healthcare

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***Abstract*—This paper aims to analyze the effect of emotional intelligence on the performance of healthcare personnel through a cross-sectional study on medical and nursing final and pre-final year students. It also tries to analyze the trends between the differences in the emotional intelligence of male and female professionals and the differences in their performance. The results from the study show that female healthcare professionals possess greater emotional intelligence and perform better in clinical duties.**

***Index Terms*—Emotional Intelligence, Doctors' performance, Nurses' performance, EI of doctors, EI of nurses**

I. Introduction

Intelligence is not only limited to knowing the facts and thinking with sound logic. It also includes recognizing our emotions and those of others and controlling our emotions. People who can differentiate between various feelings and manage their emotions well are said to have good emotional intelligence, which is measured in Emotional Quotient [15]. Emotional intelligence has a very fundamental role in healthcare. It fundamentally influences human cognitive processes, including perception, attention, learning, and reasoning. Frontline healthcare workers must work in emotionally charged environments and form and maintain relationships with co-workers, patients, and their families. Clinical decisions are often taken in chaotic environments and are simultaneously bound by professional ethics and codes of practice [12]. Emotions affect healthcare professionals at an interpersonal level, influence professional relationships, and impact patient care decisions. In healthcare, the impact of the environment and emotions of the persons there can lead to problems for the professionals. They may get affected too much by the environment around them, or it may also occur that they become emotionally very passive if they keep denying the emotions of the people around them. So, across the academic disciplines, there is a common acceptance that understanding emotion is essential [9]. Emotional labor has been largely commandeered by nursing, and studies haven't been done concerning the doctors, but there is a need for emotional skills required for all healthcare professionals to improve treatment outcomes [8]. Healthcare professionals must engage in caring practices to manage their and others' emotions and meet patients' and their families' emotional needs. Their labour involves induction and suppression of emotions at times to sustain an outer appearance that makes others feel safe and cared [7].

II. Literature Review

The concept of emotional intelligence was originally given by Salovey and Mayer [11], but it was made popular outside the academic world by Daniel Goleman. In 1995, Goleman published a book on emotional intelligence, which became an instant bestseller. Emotional intelligence suddenly became a popular phrase in media circles [10].

Emotional intelligence theory has developed from concepts of intelligence. Historically, It has been difficult to understand the nature of intelligence and emotion. Definitions of intelligence generally consist of behaviors associated with learning, information processing, adaptation to the environment, and thought and reasoning patterns [2], [10]. Emotions are complex reaction patterns that involve behavioral and psychological elements to personally significant levels [2]. Theodosius [14] had identified three types of emotional labor in nursing. These are therapeutic, collegial, and instrumental. Therapeutic emotional labor includes interpersonal relationships and interactions between nurses, patients, and their families. Collegial emotional labor includes interpersonal relationships and communications between nurses and within the interdisciplinary team, which must process important information and facilitate effective nursing care. Instrumental emotional labor involves using interpersonal skills while carrying out a clinical procedure to make the process more comfortable and minimize patient distress.

Emotional intelligence is based on three key concepts [5].

1) Emotions are an important part of life.
2) The way that individuals perceive and manage emotions differs.
3) Emotions contribute to overall coping and well-being in all areas of life.

There are two issues of conflict around emotional intelligence. The first question is whether it necessarily represents an ability to reason about emotion or is it just a personality trait. The second issue arises when measuring emotional intelligence. It isn't very clear whether emotional intelligence can be measured using self-report or whether an intelligence quotient-type measure of emotional intelligence ability is needed. Due to these issues, a wide variety of methods are currently being

used to measure emotional intelligence, and the correlation between them is so usually so low that concerns have been raised whether the tests measure the same thing or not [4].

Globally, Research has been conducted on nurses and doctors separately in the past, but the research has been limited to doctors or nurses. No significant study has been done comparing the performance of doctors and nurses and their relation to emotional intelligence. It would be beneficial to build knowledge about emotional intelligence and its effect on healthcare workers, including doctors and nurses of both genders. It would be useful to explore in more detail whether there are differences between nurses and doctors and gender. The only studies to include both types of health care professional were Bamberger et al [3], Dafeeah et al [6], and Sommaruga et al [13]. The latter two studies were heavily weighted toward nurses, making meaningful comparisons difficult. Very few studies have been conducted in India, and research involving health professionals in India would be useful to see if past findings are consistent with them.

III. Methodology

A. Design and sample

In this study, a cross-sectional survey design has been used because it is best suited for describing the status of any phenomena or relationships between different factors of phenomena at a fixed point in time. The initial sample consisted of 50 nursing and 50 MBBS students with male and female participants. Male and female students from both nursing and MBBS were included in the study for several reasons. Nurses have different responsibilities than doctors during the treatment of patients. Men and Women generally have different emotional quotients, and their ability and style to handle critical situations vary significantly.

B. Instrument

An online survey was conducted for the study, and Google Forms was used to record the participants' responses. The survey forms consisted of four sections.

The first section consisted of questions on a person's identity, like the gender and age of the participant and whether the participant is a medical student or a nursing student.

The second section of the survey consisted of questions that focused on how the participants manage their emotions and how much they are aware of them. For this task, three self-awareness, self-regulation, motivation, empathy, and social skills questions were adapted from the emotional intelligence mapping tool developed by mindtools.com website [17].

The third section of the survey consisted of questions targeted at measuring how participants identified other's emotions. For this, questions were adapted from an emotional intelligence measurement tool developed by Greater Good magazine [16] in which a participant has to identify the emotion of the person in the image.

The fourth section of the survey consists of questions to measure the participants' professional efficiency. In this section, participants were asked how they address the problems of the patients and their family members, how stressed they are while working, how effectively they communicate with their team members, etc.

TABLE I
Scores for self emotion awareness

Group	Minimum	Maximum	Median	Mean
Female	2.0	37.0	18.0	19.52
Male	-4.0	31.0	13.0	13.30
Overall	-4.0	37.0	16.0	17.27

C. Data Collection

Participants from nursing and medical colleges have been chosen for the study through personal outreach. They were contacted and briefed about the research, and when they agreed to participate, a Questionnaire was sent to them. Initially, the survey form was sent to 100 participants, out of which 76 participants filled out the survey. In the responses, there were missing values for which entries were removed. Finally, data of 36 participants was used for analysis in the study.

D. Data Analysis

Each participant's data was annotated for evaluation, and scores were calculated for the tests according to their answers. After calculating the scores for each individual, statistical analysis was done, and box plots were plotted to analyze the spread of scores for different factors for male and female participants separately.

After this, correlation analysis was performed, and scatter plots were created to visualize the correlation between gender and emotional intelligence and the performance of participants in healthcare.

E. Ethical Considerations

The survey form sent to the participants outlined the purpose of the study. It also mentioned that their participation was entirely voluntary and that they could choose not to answer the questions anytime before submitting it. Participants were also informed that confidentiality of data would be maintained, and any personally identifiable information such as name, email, or contact number wasn't recorded in the survey.

IV. Observations

A. Awareness of own Emotions

The answers were analyzed to assess the participants' awareness of their own emotions, and scores were assigned from 0 to 5 or 0 to -5, depending on whether the questions assessed a positive or negative trait. After that, the sum of all the scores was taken to calculate each participant's final score for awareness of their own emotions. The spread of the scores of male and female participants can be observed in Figure 1. In the box plot, it can be observed that the female participants had a significantly higher self-awareness score with 25th percentile score of females being higher than the median of the male participants. The minimum, maximum, median, and mean self-awareness scores have been tabulated in Table 1. Table 1 shows

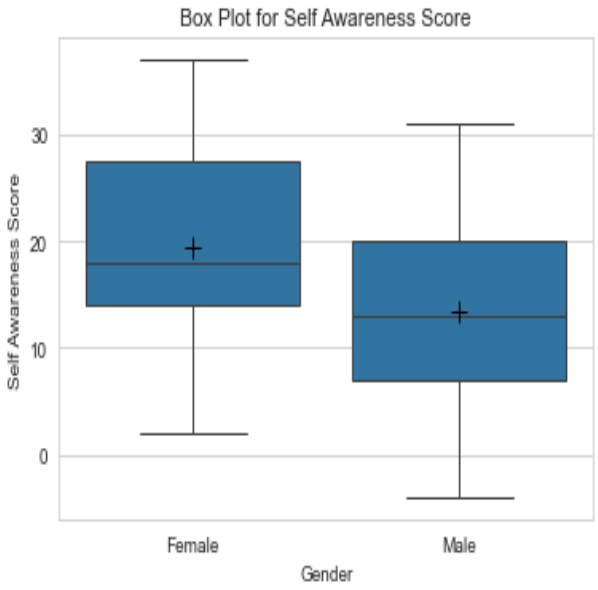

Fig. 1. Box plot for scores for awareness of own emotions

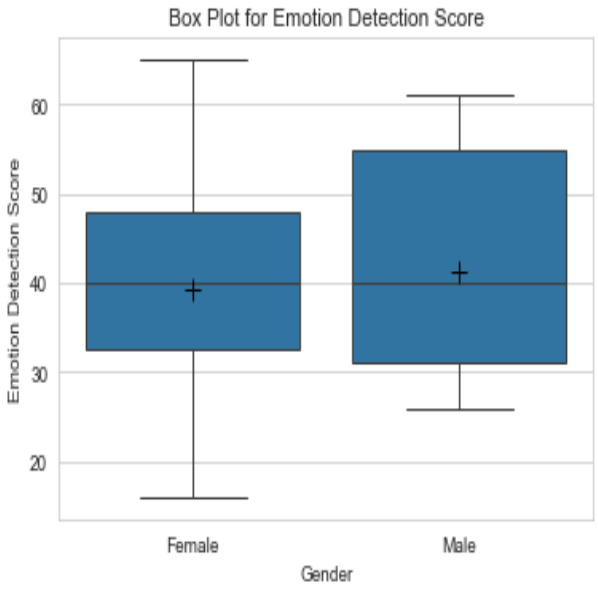

Fig. 2. Box plot for scores for awareness of others' emotions

TABLE II
SCORES FOR ABILITY TO DETECT EMOTIONS

Group	Minimum	Maximum	Median	Mean
Female	16	65	40.0	39.17
Male	26	61.0	40.0	41.38
Overall	16.0	65.0	40.0	39.97

that the median self-awareness score for female participants was 18.0, whereas that for male participants was 13.0. Overall, the median self-awareness score was 16.0. Hence, it can be calculated that the female participants showed a higher awareness of their emotions.

B. Ability to Detect Others' Emotions

To analyze the participants' ability to detect others' emotions, fifteen images representing different emotions were shown to them. Four emotions were given to the participants to select the correct emotion. For each correct answer, five marks were awarded. For wrong answers, 0 marks were awarded. The spread of the scores is represented in Fig. 2. In Figure 2, we can observe that the scores for emotion detection have less spread for male participants compared to female participants. However, the median scores for both the male and female participants are almost similar. The minimum, maximum, median, and mean scores for emotion detection have been tabulated in Table 2.

Table 2 shows that the median score for female participants was 40.0, whereas that of the male participants was also 40.0. However, the mean score for the ability to detect others' emotions for male participants was slightly greater than the mean score for females. This correctly represents that the data for male participants is spread less than the female participants. Looking at the box plot, minimum score, maximum score, mean score, and median score, we can conclude that male participants tend to identify others' emotions more accurately than female participants.

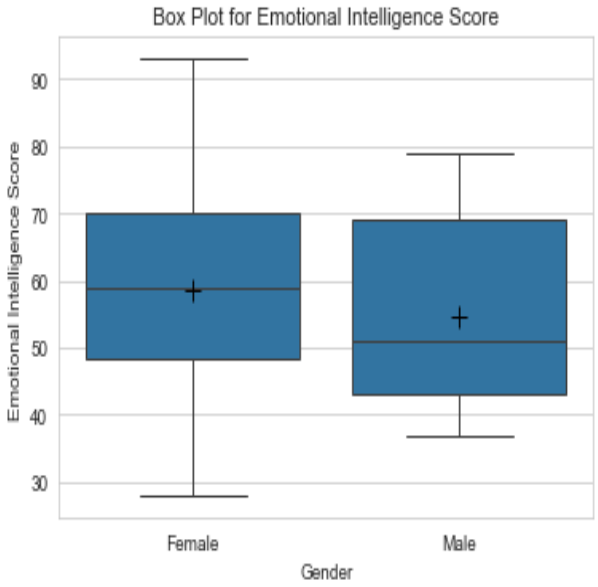

Fig. 3. Box plot for calculated Emotional Intelligence Score

C. Emotional Intelligence

The emotional intelligence score for this paper was calculated as the sum of self-awareness scores and scores for detecting others' emotions for each participant. The spread of the scores for male and female participants can be observed in Figure 3.

In Figure 3, the median emotional intelligence score for female participants is significantly higher than for male participants. Also, the scores of the female participants are

TABLE III
SCORES FOR EMOTIONAL INTELLIGENCE

Group	Minimum	Maximum	Median	Mean
Female	28	93	59.0	58.69
Male	37	79.0	51.0	54.69
Overall	93.0	37.0	56.5	57.25

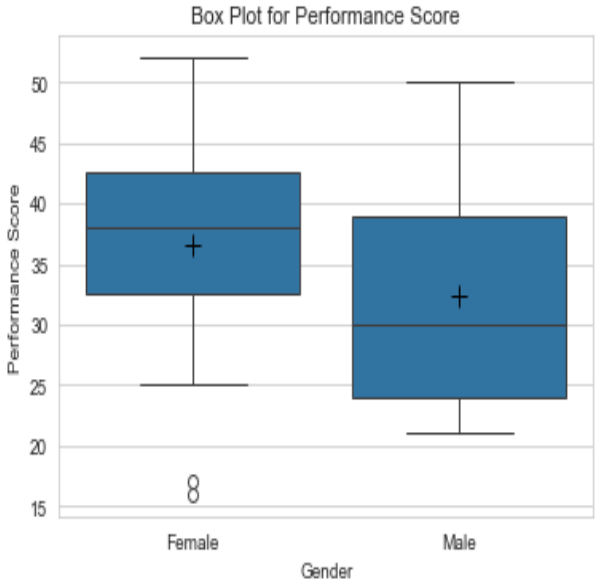

Fig. 4. Box plot for calculated Workplace performance

less spread out compared to the male participants, and the 25 percentile score of the female participants is comparable to the median emotional intelligence score for the male participants. The minimum, maximum, median, and mean scores for emotional intelligence of male participants, female participants, and the entire population have been tabulated in Table III.

In Table III, the median score for female participants was 59.0, whereas that of the male participants was also 51.0. Looking at the box plot, minimum score, maximum score, mean score, and median score,we can conclude that female participants have better emotional intelligence than male participants.

D. Performance

The workplace performance of healthcare professionals was assessed using 14 questions. The answers were analyzed and assigned scores from 0 to 5 or -5 to 0 depending on whether the questions assessed a positive or negative trait. After that, the sum of all the scores was taken to calculate each participant's final score for their workplace performance. The spread for the scores of male and female participants can be observed in Figure 4.

Figure 4 shows that the workplace performance of female healthcare professionals is significantly higher than that of male healthcare professionals. The median score for female participants' workplace performance is almost the 75th percentile of the male participants' workplace performance score. Interestingly, there are two outlier data points for female participants. Due to this, the performance score data for female participants has been negatively skewed. On the other hand, the spread of data points for the male participants is contained and has no outliers. Hence, the data is positively skewed for male participants.

The minimum, maximum, median, and mean scores for workplace performance of male participants, female participants, and the entire population have been tabulated in Table IV.

TABLE IV
SCORES FOR WORKPLACE PERFORMANCE

Group	Minimum	Maximum	Median	Mean
Female	16	52	38.0	36.56
Male	21	50.0	30.0	32.38
Overall	16.0	52.0	36.0	35.05

In Table IV, the median score for female participants' workplace performance was 38.0, whereas that of the male participants was 30.0. Looking at the box plot, minimum score, maximum score, mean score, and median score, we can conclude that female healthcare professionals perform better than their male counterparts in their workplace.

E. Self emotion awareness vs performance

Analysis of Awareness of own emotions vs performance of the participants shows that the correlation between performance and awareness of own emotions for female participants is 0.659 whereas that for the male participants is 0.687. The correlation between performance and awareness of emotions for the overall population is 0.689. This shows that the workplace performance of male healthcare professionals is slightly more dependent on their ability to feel their emotions than their female counterparts.

However, if we observe the scatter plot for self-awareness scores and performance for the male and female participants, as given in Figure 5, most of the female participants have self-awareness scores in the range of 10 to 30 and performance scores in the range of 25 to 50. On the contrary, the data points for male participants are spread in the self-awareness score range of 0 to 20 and the performance score range of 20 to 45.

F. Ability to detect others' emotions vs performance

Analysis of the ability to detect others' emotions vs performance of the participants shows that the correlation between performance and ability to detect others' emotions for female participants is 0.357, whereas that for the male participants is 0.122. The correlation between performance and the ability to detect others' emotions for the overall population is 0.243. This shows that the workplace performance of healthcare professionals is not very dependent on their ability

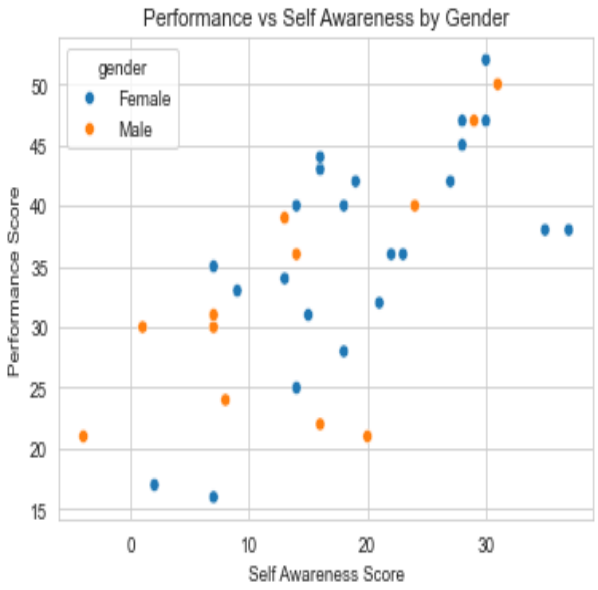

Fig. 5. Performance vs Self Awareness by Gender

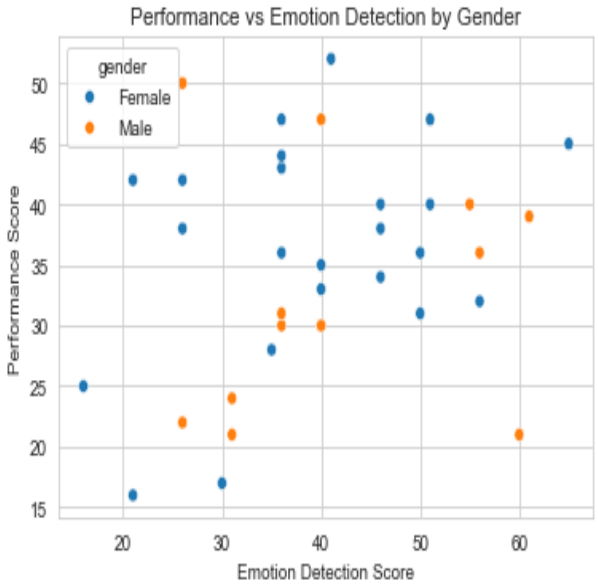

Fig. 6. Performance vs Emotion detection by Gender

to detect others' emotions.

This can also been observed in the scatter plot given in Figure 6 where the performance of the healthcare professionals varies significantly for a fixed range of emotion detection score.

G. Emotional Intelligence vs performance

Analysis of emotional intelligence vs performance of the participants shows that the correlation between performance and ability to detect others' emotions for female participants is 0.622, whereas that for the male participants is 0.619. The

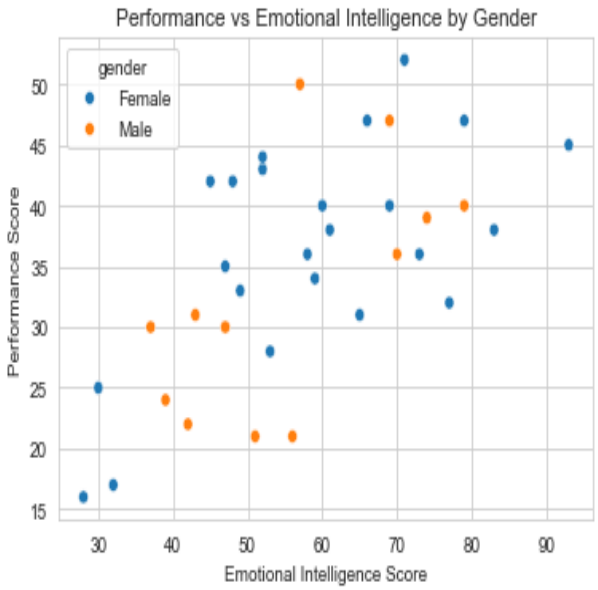

Fig. 7. Performance vs Emotional intelligence by Gender

correlation between performance and emotional intelligence for the overall population is 0.625. This shows that the workplace performance of healthcare professionals is significantly dependent on their emotional intelligence.

This can also be observed in the scatter plot given in Figure 7, where the performance of healthcare professionals increases with an increase in emotional intelligence and vice versa.

V. Results

Using the observations in the previous subsections, we can conclude the following statements.

1) Female participants scored more in the section that focused on how the participants manage their emotions and how much they are aware of them. It was also seen that the highest scores were obtained by female participants in this section, while the lowest score was obtained by male participants.
2) Male participants scored more in the section which consisted of questions which were targeted on measuring how participants identified other's emotions on average. In this section, the scores of the female participants varied significantly, while male participants had higher average scores. The female participants scored the lowest as well as the highest points.
3) Overall, Female participants performed better in sections where emotional intelligence was assessed. Male participants neither scored very low nor very high in emotional intelligence tests, whereas some female participants had very high emotional intelligence scores, and others had low emotional intelligence scores.
4) Female participants performed better in clinical performance. The average performance score for female partic-

ipants was 36.56, 32.38 for male participants, and 35.05 overall. Also, male participants scored in a narrower range than female participants, and both the lowest and highest scores were obtained by female participants.

5) Emotional intelligence scores of participants were significantly correlated with their performance scores. The correlation value between the emotional intelligence scores of participants and their performance scores was found to be 0.625.
6) Emotional intelligence and performance scores of female participants were slightly more correlated than male participants. The correlation between the scores of female participants was found to be 0.622, while the correlation between male participants was found to be 0.619.

VI. Conclusion

This study was conducted to analyze emotional intelligence's effect on healthcare personnel's performance through a cross-sectional study on medical and nursing final and pre-final year students. Trends between the emotional intelligence of male and female professionals and their performance were analyzed. From the study results, it can be concluded that female healthcare professionals have good emotional intelligence compared to their male counterparts. They also perform better than male healthcare professionals.

VII. Limitations

Survey was conducted with questionnaires which were done using google forms, So the reliability of answers are slightly less because participants might not have answered the questionnaire carefully. There might be different interpretations of questions, and participants might not be one hundred percent honest while answering the questionnaire, which may have led to errors. Also, a very small group of only 36 people has been included in the study, so results may vary if more people are included in the study.

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