Comparative Study of Malaysian Medical Students’ Empathy Scores Between Preclinical and Clinical Training

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ABSTRACT

This study aims to compare the empathy scores of Malaysian medical students between preclinical and clinical training, and to identify the predictive factors for empathic behaviour. In this cross-sectional study, the medical student version of the Jefferson Scale of Empathy (JSE-S) was distributed to medical students at Quest International University (QIU), Malaysia. The JSE-S scores are analysed using independent t-tests to determine any significant difference between the preclinical and clinical training. We use a one-way ANOVA test to identify the factors influencing medical students’ empathy levels. A total of 85% of the students responded to the questionnaires. The mean JSE-S scores for QIU medical students is 106.2 (M = 106.2, SD = 13.5). Female students have significantly higher empathy scores than males (F(1,240) = 8.32, p = 0.004). The compassionate domain of empathy scores increased significantly with an increase in the year of medical school (F(4,237) = 3.135, p = 0.015). Compared to medical students in preclinical training, clinical students had statistically significant higher empathy scores in compassionate care (t(240) = –2.08, p = 0.039). In general, medical students in QIU exhibited an increasing trend of empathy scores across their training. Interestingly, compared to preclinical students, clinical students had higher affective empathy scores (compassionate care) whereas their cognitive empathy scores remained unchanged. We suggest including courses on cognitive empathy training in the QIU curriculum.

Keywords: Empathy scores, Malaysian medical students, Preclinical training, Clinical training

INTRODUCTION

Empathy is defined as the cognitive ability to understand the feelings of another by imagining oneself in that person’s situation, combined with the expression of that awareness and the willingness to help (1). In medical settings, doctor-patient communication is important for improving patients’ trust, satisfaction and compliance...
with treatment recommendations (2). Several studies suggest that a high empathy level is strongly linked to positive outcomes in future medical professional life (3). Nowadays, the medical curriculum includes empathy as one of the most important skills which can be taught and developed during medical education (4). Therefore, medical educators should focus on teaching and evaluation pedagogies to enhance empathetic behaviour in medical students.

To promote empathy in medical students, medical schools have employed a range of interventions such as early clinical exposure, teaching medical ethics, professionalism training workshops, etc. (5). The Faculty of Medicine at Quest International University (QIU), Malaysia, is using an integrated modular curriculum which incorporates educational programmes, including courses in ethics and professionalism and hospital visits during the preclinical years of medical education. Thus, proper evaluation of the effectiveness of QIU’s curriculum for developing empathetic behaviour is important.

The Jefferson Scale of Empathy (JSE) is the most widely used tool for measuring empathy in the healthcare setting and it has been translated to 56 languages/dialects (6). The JSE also has three different versions: medical students, health professions and health professions students. Worldwide, the Jefferson Scale of Empathy, medical student version (JSE-S) is a highly validated scale for measuring empathy for medical students (7–8). The Cronbach alpha value of JSE-S is at least 0.80, indicating high internal consistency and reliability (8–9). The JSE-S measures empathy in terms of three dimensions: compassionate care, perspective-taking and standing in the patient’s shoes (9).

The JSE-S will be used to analyse the scores according to gender, age, curriculum, years of medical students, specialty and countries of origin. Increased empathy level in medical students as they progressed through medical school has been reported in studies conducted in Japanese, South Korean, Portuguese and Iranian medical schools (10–13). In contrast, American, Pakistani and Iranian medical school students showed a significant decline in empathy levels during clinical years of medical education (14–16).

Medical students’ empathy levels declined in clinical training years until graduation compared to preclinical years. When medical students started clinical training, empathy level decreased significantly (14–16). These studies have suggested that overwhelming pressure to cope with the stress and emotions of the clinical settings caused the students to become less empathetic. On the other hand, empathy significantly increased in clinical years compared to preclinical years in some studies (10–13). These findings indicate that the learning practices, hidden curricula, cultural influences and targeted training to promote empathy might influence medical students’ empathy level. Therefore, the contradicting results of many studies indicate the need to conduct well-structured research to evaluate the different empathy scores between preclinical and clinical medical students and develop strategies to help them become empathetic doctors.

Although there are many recent studies about the role of empathy in medical education, there is limited information about the different dimensions of empathy. Empathy is a multidimensional concept with three main domains: compassionate care or emotional empathy, perspective-taking and standing in the patient’s shoes are collectively known as cognitive empathy (9). Cognitive empathy is a higher-order brain function, whereas emotional empathy is the primitive and automatic brain function (9). The current research compared this theoretical model of the subcomponents of empathy between preclinical and clinical years of medical education. Therefore, this study aims to assess and compare the medical students’ empathy levels between preclinical and clinical years in the Faculty
METHODOLOGY

Study Design and Settings

This was a cross-sectional, paper-based questionnaire study conducted in the middle of the 2019–2020 academic year on medical students in the first to fifth years of training. This study assessed the levels of empathy in medical students by using the JSE-S. It was conducted in QIU, Malaysia. QIU’s Bachelor of Medicine, Bachelor of Surgery (MBBS) programme, a typical 5-year programme in Malaysia, uses an integrated modular curriculum that incorporates training about ethics and professionalism throughout the 5-year training period, with assessment of this training in year 4. Although QIU medical students have early hospital visits and clinical skills training in preclinical years, they begin their clinical rotations and clerkships at year 3. QIU’s ethical review board approved this study with the reference number, JREC/Feb 2019/18.

Participants

Out of 284 medical students in QIU, 242 responded to the questionnaires. We included all the medical students of QIU who agreed to participate in this research and excluded the medical students who did not agree to participate. Their participation was entirely voluntary, with no credits or payment awarded. The participants were well-informed about the study and provided written informed consent form before participation.

Instruments

This study uses self-reporting questionnaires in English, which consist of 20 items measured on a 7-point Likert scale ranging from 1 = strongly disagree to 7 = strongly agree. Ten items are reverse-scored with scales ranging from 1 = strongly agree to 7 = strongly disagree. The total score is the sum of all individual responses with a minimum score of 20 to a maximum score of 140. Higher scores mean higher empathetic behaviour orientation. The items are divided into three components: perspective taking, compassionate care and standing in the patient’s shoes.

Data Collection

Overall, 242 (85%) out of 284 QIU medical students responded to this survey. Medical students of basic preclinical training (years 1 and 2) and clinical training (years 3 to 5) were recruited at the end of lectures. One of the researchers explained the research. Printed informed consent forms were distributed to those students who wished to participate. Once these forms were completed and returned, paper-based JSE-S questionnaires were distributed.

Data Analysis

Statistical analysis was done by SPSS for Mac, version 26. We calculated Cronbach’s alpha for internal consistency of JSE-S scores. In this study, demographic factors such as age, gender, years of medical school and specialty interest were analysed by using a one-way ANOVA test. We compared the empathy scores of preclinical and clinical students by using the independent t-test. All statistical analyses are 2-tailed and p-value < 0.05 is considered statistically significant.

RESULTS

Figure 1 shows the distribution of respondents and total students enrolled over the five years of medical school. Cronbach alpha coefficient of JSE-S was (α = 0.806) which suggests adequate reliability, given that the accepted benchmark for internal consistency is 0.7.
The lowest empathy scores were observed in year 1 medical students (M = 102.8, SD = 14.0), whereas the highest was found in year 4 students (M = 109.1, SD = 12.4). There was no significant effect of age (F(4,237) = 1.196, p = 0.355), education level (F(4,237) = 1.705, p = 0.15) or specialty preference (F(1,240) = 0.556, p = 0.457) (see Table 1).

We used 22 years of age as the cut-off point because most of the preclinical students were less than 22 years of age, whereas those in clinical years were older than 22. The mean JSE-S score for all medical students was 106.2 (M = 106.2, SD = 13.5). Figure 2 shows changes in empathy scores across five years of medical school. The ANOVA test indicates a statistically significant effect for gender (F(1,240) = 8.32, p = 0.004), with higher mean JSE-S scores for female students (M = 108.0, SD = 13.0) compared to male students (M = 102.8, SD = 14.0).
The results of the three components and analysis of JSE-S scores across the years of study are reported in Table 2. One-way ANOVA analysis indicates that there is a statistically significant difference in compassionate care across the years of medical school ($F_{(4,237)} = 3.135$, $p = 0.015$). Post hoc Tukey test indicates that year 4 medical students had significantly higher scores of compassionate care than year 1 medical students ($p = 0.007$). No significant differences were found in perspective-taking or standing in the patient’s shoes.

A total of 100 preclinical and 142 clinical students were compared in terms of JSE-S scores, age, gender and plan for a specialty by using a 2-tailed $t$-test (Table 3). Here as well, clinical students had significantly higher compassionate care scores ($M = 41.7$, $SD = 7.5$) than preclinical students ($M = 39.6$, $SD = 8.2$) ($t_{(240)} = -2.08$, $p = 0.039$). No significant differences in empathy scores between preclinical and clinical students were found in perspective taking ($t_{(240)} = 0.46$, $p = 0.648$) or standing in the patient’s shoes ($t_{(240)} = -0.26$, $p = 0.796$). Similarly, there was no significant difference in total JSE-S scores between preclinical and clinical students for age or gender.

### Table 1: Demographic characteristics and mean JSE-S scores distributions among medical students

| Characteristics          | Number (%)  | Mean scores (SD) | $p$-value |
|--------------------------|-------------|------------------|-----------|
|                          | $N = 242$   | Total scores = 140 |           |
| Response rate            | 242/284 (85.0) | 106.2 (13.5) |           |
| Gender                   |             |                  | 0.004     |
| Male                     | 83 (34.0)   | 102.8 (14.0)     |           |
| Female                   | 159 (66.0)  | 108.0 (13.0)     |           |
| Age                      |             |                  | 0.355     |
| <22 years                | 109 (45.0)  | 105.3 (13.8)     |           |
| ≥22 years                | 133 (55.0)  | 106.9 (13.3)     |           |
| MBBS year                |             |                  | 0.150     |
| Year 1                   | 47 (19.4)   | 102.8 (14.0)     |           |
| Year 2                   | 53 (22.0)   | 106.4 (13.7)     |           |
| Year 3                   | 46 (19.0)   | 104.5 (13.9)     |           |
| Year 4                   | 47 (19.4)   | 109.1 (12.4)     |           |
| Year 5                   | 49 (20.2)   | 108.0 (13.2)     |           |
| Future plan for specialty|             |                  | 0.457     |
| Yes                      | 184 (76.0)  | 105.8 (13.4)     |           |
| No                       | 58 (24.0)   | 107.4 (13.8)     |           |
### Table 2: Changes in three dimensions of empathy scores across five years of medical school

| Perspectives/Year of medical school | Number of students | Mean scores | SD | Significance p-value |
|-------------------------------------|--------------------|-------------|----|----------------------|
| Cognitive/perspective-taking        |                    |             |    |                      |
| Year 1                              | 47                 | 57.5        | 7.5| 0.345                |
| Year 2                              | 53                 | 56.6        | 10.3|                      |
| Year 3                              | 46                 | 55.6        | 8.3|                      |
| Year 4                              | 47                 | 58.1        | 7.4|                      |
| Year 5                              | 49                 | 58.8        | 6.7|                      |
| Compassionate care                  |                    |             |    | 0.015                |
| Year 1                              | 47                 | 37.6        | 9.6|                      |
| Year 2                              | 53                 | 41.3        | 6.3|                      |
| Year 3                              | 46                 | 40.7        | 8.3|                      |
| Year 4                              | 47                 | 43.0        | 6.0|                      |
| Year 5                              | 49                 | 41.3        | 7.8|                      |
| Standing in the patient's shoes     |                    |             |    | 0.519                |
| Year 1                              | 47                 | 7.7         | 2.5|                      |
| Year 2                              | 53                 | 8.5         | 2.9|                      |
| Year 3                              | 46                 | 8.3         | 2.6|                      |
| Year 4                              | 47                 | 8.0         | 2.5|                      |
| Year 5                              | 49                 | 7.9         | 2.8|                      |

### Table 3: Comparison of empathy scores between preclinical and clinical year (2-tailed t-test)

| Outcomes                                  | Preclinical (n = 100) Mean (SD) | Clinical (n = 142) Mean (SD) | 95% (CI) | p-value |
|-------------------------------------------|---------------------------------|------------------------------|----------|---------|
| Three dimensions of JSE-S scores          |                                 |                              |          |         |
| Cognitive/perspective                     | 57.0 (9.0)                      | 57.5 (7.5)                   | −2.6 to 1.6 | 0.648   |
| Compassionate care                        | 39.6 (8.2)                      | 41.7 (7.5)                   | −4.1 to −0.11 | 0.039   |
| Standing in the patient's shoes           | 8.2 (2.7)                       | 8.1 (2.6)                    | −0.59 to 0.77 | 0.796   |
| JSE-S total scores                        | 104.7 (13.9)                    | 107.2 (13.2)                 | −6.0 to 0.96 | 0.155   |
| JSE-S scores with different age groups    |                                 |                              |          |         |
| <22 years                                 | 105.4 (14.1)                    | 105 (13)                     | −5.5 to 6.3 | 0.888   |
| ≥22 years                                 | 102.1 (12.9)                    | 107.8 (13.2)                 | −11.9 to 0.48 | 0.070   |
| Gender difference in JSE-S scores         |                                 |                              |          |         |
| Male                                      | 99.5 (14.7)                     | 105.2 (13.1)                 | −11.8 to 0.39 | 0.066   |
| Female                                    | 107.6 (12.6)                    | 108.3 (13.2)                 | −4.9 to 3.4  | 0.73    |

(continued on next page)
DISCUSSION

In the present study, the mean JSE-S score of Malaysian medical students at QIU is 106.2 (SD = 13.5) (Table 1), which is lower than those observed in the US, Ireland, South Korea and the Jeffery Cheah School of Medicine, Malaysia (9, 11, 17–18) and higher than those observed in Japan, Iran, China and Pakistan (10, 13, 19–21). Therefore, QIU empathy scores are higher than those of most Asian medical schools, except one Malaysian counterpart and one South Korean school. One of the most important influences on medical students’ empathy is the medical school curriculum, which includes early patient contact, communication and clinical skills courses, mentoring relationships and self-reflection skills for students and teachers (22).

Furthermore, empathy grows as students’ progress through medical school with two sharp decrease in empathy scores (dips) in the year 3 and final year (Figure 2). The downward trend in year 3 medical school, marked by the transition to clinical placement, was also found in a longitudinal study at Jefferson Medical College, US (14) and 18 other studies (23). A similar trend of empathy scores was also observed in one of the Korean medical schools with two dips; one in the year 3 and the other was in the year 5 (24). The reduced level of empathy in the two clinical years may be due to a lack of role models (25–26), a lack of reflection practice in medical education (27), sleep deprivation (28), a higher academic workload (18) or negative educational environments (29). In contrast, a cross-sectional study of Portuguese medical students reports higher empathy scores in senior medical students compared to preclinical years (13). Our findings are also not in agreement with the results of a cross-sectional 2006 Japanese study using the same JSE-S scores, which reports an increasing trend of empathy level in medical students (10).

Recently published cross-sectional or longitudinal studies report contrasting trends of increasing, decreasing, stable and swinging empathy scores in medical students (30). The studies showed that the “hidden”, “formal” and “informal” curricula could be the main reasons for these results (23). Our data support an emphasis on teaching empathy and communication skills in the QIU curriculum to restore the empathy level of medical students in the year 3 and final year of medical education.

Female medical students’ empathy scores were significantly higher in this study than those of their male counterparts (Table 1). This contrasts with the result of no correlation between empathy scores and gender from the South Korean study which involved 233 medical students after one year of medical education (11).

Table 3: (continued)

| Outcomes                          | Preclinical (n = 100) | Clinical (n = 142) | 95% (CI)       | p-value |
|-----------------------------------|----------------------|-------------------|----------------|---------|
| Gender difference in JSE-S scores |                      |                   |                |         |
| Male                              | 99.5 (14.7)          | 105.2 (13.1)      | −11.8 to 0.39  | 0.066   |
| Female                            | 107.6 (12.6)         | 108.3 (13.2)      | −4.9 to 3.4    | 0.73    |
| Future plan for specialty         |                      |                   |                |         |
| Yes                               | 104.2 (13.8)         | 107.3 (13.1)      | −7.0 to 0.8    | 0.118   |
| No                                | 108.0 (14.5)         | 107.2 (13.7)      | −7.6 to 9.1    | 0.118   |
clinical students (Table 2). In contrast, a cross-sectional Pakistani study conducted by Mirani et al. (21) reported a decreasing trend in three dimensions of empathy scores across the five years of medical education. This was attributed to the stress of long working hours, lack of sleep and increased responsibilities that come in the later years of medical education (21).

Our findings also contrasted with those of Quince et al.’s (37) study at the University of Cambridge over a period of four years. This longitudinal study reports that affective empathy was significantly decreased with no change in cognitive empathy during the medical course. It is postulated that QIU medical curriculum enhanced the development of compassionate care subscale. One possible explanation could be that the students’ clinical experience with the patients stimulated their empathetic system to develop affective empathy, which is more of an autonomic and primitive process compared to cognitive empathy (38).

It is suggested that the QIU curriculum has adequate clinical training with patients. There is a linear relationship between cognitive empathy and clinical outcomes, whereas the relationship between emotional empathy and clinical outcomes corresponds to a bell-shaped curve (14). An excess of emotional empathy could lead to detrimental effects such as fatigue, exhaustion and traumatisation. On the other hand, cognitive empathy progressively improves clinical outcomes and might be enhanced by training (38). Interestingly, the cognitive empathy levels in QIU medical students remained unchanged between preclinical and clinical training. Our results closely matched those of Quince et al. (37) in terms of cognitive empathy levels. The cognitive empathy level could be enhanced by a fuller understanding of the biopsychosocial model of healthcare (38). For example, medical students could achieve cognitive empathy if they act not only on patients’ symptoms (biological factors) but also on the psychological and social factors contributing to patients’

contrasting results were thought to be due to culture-specific characteristics (11). Our finding is consistent with the results of other studies (15, 18, 21, 24, 31–33). Higher empathy scores in females are explained by gender role expectations and stronger non-verbal emotional recognition skills in females (32). Moreover, women are more emotionally sensitive compared to men, due to the higher levels in brain activation in the amygdala (34) and the right cerebral hemisphere (35) in response to empathy-inducing events, according to neuroimaging studies.

Interestingly, we found no significant difference in empathy level in terms of age or career preference. This contrasts with a 2010 cross-sectional Iranian study of 260 medical students, which evidenced an inverse relationship between empathy scores and age and showed a significant decline in empathy level in clinical years (15). However, Chatterjee et al. (36) align with our finding that empathy levels do not correlate with age or specialty interest. It is unclear whether these age-related empathy patterns in QIU medical students are the results of the potential cohort effects or true non-linear correlation between the age and the empathy level of medical students. Our data could not clearly differentiate between the two causes, as we took cross-sectional samples of medical students.

A comparative analysis using three subscales of JSE-S (perspective taking, compassionate care, standing in the patient’s shoes) was performed on QIU medical students across the years of medical school. Perspective-taking and standing in the patient’s shoes are included under cognitive empathy, which is the ability to recognise and understand the feelings of others. On the other hand, compassionate care is affective or emotionally based empathy, which is the ability to share the feeling of others and the capacity for intuitive emotional responses (9). We found that compassionate care increased significantly whereas the difference in the remaining two subscales is not significant between preclinical and
illnesses and plan optimal management accordingly. Currently, the QIU curriculum is based on this biopsychosocial model of healthcare; however, we recommend incorporating more of this model of healthcare into our clinical teaching.

The strength of this study is its separate analysis for the three dimensions of JSE-S scores across the years of medical education. In medical education, emotions are generally believed to be harmful to clinical decision-making. By doing the dimensional analysis of JSE-S scores, increased emotional empathy improved clinical outcomes up to a certain limit; beyond that limit, excessive emotional empathy could lead to negative clinical outcomes due to mental exhaustion (38). However, better cognitive empathy is directly related to positive clinical outcomes and could be enhanced by medical education (38). Therefore, dimensional analysis of empathy scores supports the idea that medical educators should understand the correlations between the subcomponents of empathy and their impacts on clinical outcomes.

However, there are several limitations to this study. First, it was conducted in just one private medical university in Malaysia, which limits the generalisability of our findings. Second, the cross-sectional design of our study could not confirm the validity of our results because the baseline differences could not be controlled. Third, we used a self-reported questionnaire which is not always accurate in reflecting actual behaviours. The students might know the desirable answers of the questionnaires from some source of information which will reduce the reliability and validity of the responses.

In future, it would be valuable to conduct studies from the first year of medical school to the final year to eliminate the baseline difference. Ideally, future studies should be carried out by comparing the international cohorts of medical students from various medical universities with different medical curricular designs, to overcome the above-mentioned limitations. It would also be interesting to see whether factors such as role-modelling, self-reflection practice, communication skills training courses, mentoring schemes or stressful and hostile medical culture have any impact on empathy level in medical students.

CONCLUSION

Our results show increased empathy scores of medical students, with two dips in the third and final years, across their training in QIU. These results contrast with findings of reducing empathy scores in many medical universities across the world. In addition, we discovered that female medical students were more empathetic than their male counterparts in QIU. We also found that the compassionate domain of empathy scores increased significantly with progress in the year of medical school. Dimensional analysis of empathy scores indicates an increase in affective empathy scores (compassionate care) in clinical students compared to pre-clinical students, whereas the cognitive empathy scores remained unchanged. This study helps to conceptualise the individual domains of empathy levels across the years of medical school and to identify the subcomponents which need to be promoted or curbed in order to enhance clinical decision-making. The findings of this study will also assist in reshaping the QIU curriculum to optimise the different dimensions of empathy.

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ETHICAL APPROVAL

The QIU’s ethical review board approved this study with the reference number, JREC/ Feb 2019/18.

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