

A preliminary study of empathy, emotional intelligence and examination performance in MBChB students

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CONTEXT There is considerable interest in the attributes other than cognitive ability that medical students need in order to be professionally successful, with a particular focus on empathy and emotional intelligence (EI). Selection considerations have also motivated interest in such attributes as predictors of academic success. There are reports of declines in empathy in US medical students, but no comparative information is available for UK students.

OBJECTIVES This study aimed to compare empathy levels in medical students in Years 2, 3 (pre-clinical) and 5 (clinical), to examine gender differences in empathy and EI, and to investigate whether EI and empathy are related to academic success.

METHODS Questionnaires assessing EI and empathy were completed by students. Previous empathy scores for the Year 2 cohort were also available. Empathy trends were examined using ANOVA; trends for the Year 2 group for whom Year 1 scores were available were examined using repeated-measures ANOVA. Associations of EI and empathy with academic success were examined using Pearson correlation.

RESULTS A significant gender \times cohort effect was found, with male empathy scores increasing between Years 1 and 2, whilst female scores declined. Peer ratings in Year 2 problem-based learning (PBL) groups were positively correlated with EI.

CONCLUSIONS Trends in levels of empathy differed by gender. The reasons for this require further investigation, particularly in relation to course content. Associations between academic performance and EI were sparse, and there were none between academic performance and empathy, but the effects of EI (and other characteristics) on PBL group functioning represent a promising area for future study.

KEYWORDS humans; male; female; students, medical/*psychology; *empathy; *education, medical, undergraduate; men/*psychology; women/*psychology; Scotland; cross-sectional studies; longitudinal studies.

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INTRODUCTION

Increasing attention is paid to the attributes over and above cognitive ability (as assessed by standard IQ tests) that are required for the successful pursuit of a career in medicine and to how these might be included in selection processes for medical courses.^{1–3} In this context, the effects of personality on academic performance in medical students have been studied, resulting in a general finding that the personality trait of Conscientiousness is a predictor of academic success in undergraduates.⁴ This finding has been replicated in UK and Flemish pre-clinical medical students,^{5,6} although Conscientiousness was found to be negatively associated with performance in UK clinical students.⁵ Within the specific context of UK medical student selection, interest in predictors other than examination scores is also motivated by considerations of fairness to all applicants, given concerns that medical school admission criteria and

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Overview

What is already known on this subject

A decline in empathy during medical training has been reported in North American medical students and is regarded as a cause for concern. There is some evidence for associations between empathy and EI and academic performance in medical students.

What this study adds

In this UK sample, empathy trends differed by gender, with male scores increasing and female scores declining between Years 1 and 2. Problem-based learning (PBL) group peer ratings were related to emotional intelligence.

Suggestions for further research

The reasons for the observed gender differences in empathy trends and the effects of emotional intelligence on PBL group performance should be studied further.

selection processes based mainly on academic attainment appear to disadvantage some applicant groups.^{7,8} There is also increasing recognition in the medical education literature that interpersonal skills are important for doctors, with discussion focused on the importance of the quality of the doctor–patient relationship. These considerations have led to some debate on, and implementation of, training in empathy and emotional intelligence (EI) skills as a medical degree component.^{3,9,10}

Emotional intelligence and empathy are related but distinct constructs. Although there is some divergence amongst EI researchers on the best model for EI, there is agreement that it covers the ways in which people differ in their emotional capabilities, in both the intrapersonal (mood regulation, stress management, perceiving one's own emotions) and interpersonal (social skills, perceiving others' emotions) domains. As suggested by this definition, EI measures normally assess a number of EI subcomponents as well as combining these into an overall EI score. Empathy overlaps with interpersonal EI and covers the ability to be aware of and understand another person's feelings. Recent discussions of empathy in doctors have focused on

the desirability of doctors being able to understand the feelings of their patients without becoming overly emotionally involved.^{9,11,12}

Research and discussion on EI and empathy in medical students has been paralleled by studies showing that higher perceived levels of doctor empathy and EI are associated with higher levels of patient satisfaction.^{13–15} Although the interpersonal and empathic skills of medical students and doctors have received wider literature coverage than intrapersonal skills, there is also recognition that capabilities such as mood regulation and stress management are relevant to the work environment with which doctors are required to deal^{1,3} and that doctors' personality traits are related to outcomes such as stress and burnout.¹⁶ Given the intensity of the debate on EI and empathy in medicine, there has been surprisingly little research on the extent to which they are associated with success in medical studies. Emotional intelligence was found to be positively associated with academic success in Year 1 Canadian (non-medical) students, a finding which is believed to reflect the role of EI in facilitating the transition from school to university.¹⁷ A recent study¹⁸ found some evidence for positive associations between EI and academic performance in Year 1 UK medical students. Although the general mechanism of EI facilitating the transition to university is a possible explanation for these findings, it is noteworthy that the association was found only for a course component for which EI skills were relevant and was absent for a basic science course taken by the same students. Another study found empathy to be positively associated with clinical competence in US students.¹¹ Some longitudinal studies have shown evidence of a decline in levels of empathy and conceptually related measures, such as patient-centredness, in North American medical students as they progress through their training,^{19–22} which is regarded as a cause for concern.²³ There are no published findings on longitudinal trends in empathy in UK medical students (where, unlike in North America, medicine is taken as an undergraduate degree).

Whilst discussing issues related to EI and empathy in medical students, it is also relevant to mention gender effects. Female medical students generally show better academic performance than males.²⁴ Higher scores on total EI are often found in females, although some studies report no gender difference. Subscales for EI show a more mixed picture. As with total EI, gender differences are not invariably found, but there are findings that females score higher on subscales

relating to interpersonal capabilities, whereas males score higher on subscales relating to intrapersonal capabilities.^{25,26} For empathy, females are generally found to have higher scores than males.²⁷ These findings raise the possibility, assuming that higher levels of empathy and interpersonal EI are helpful in medical studies, that EI and/or empathy levels may be a contributory factor to differences between men and women in academic success.

In the light of the above literature review, 1 objective of the present study was to compare empathy levels in medical students in Years 1, 2 (pre-clinical) and 5 (clinical), in order to determine whether the decline in empathy noted in North American students also occurs in UK students. Two additional objectives were to assess gender differences in student levels of empathy and EI, and to examine whether EI and empathy are related to academic performance.

METHODS

Participants

The participants consisted of 273 medical students (85 male, 188 female) in Years 1, 2 and 5 of the MBChB programme at Edinburgh University. Years 1 and 2 of the Edinburgh curriculum promote a multiple approach to teaching and learning, with 3 hours of problem-based learning (PBL) per week set within a timetable of blended learning (e-learning, lectures, clinical experiences, tutorials and practicals) that are constructively aligned.²⁸ Year 5 students experience conventional clinical attachments in surgery, medicine and general practice.

Measures

Participants completed a 41-item EI scale²⁹ and the 20-item Jefferson Scale of Physician Empathy.¹² The EI scale has 3 subcomponents. Optimism/Mood Regulation provides a measure of intrapersonal EI; Appraisal of Emotions is a measure of ability to perceive emotions in others, and Utilisation of Emotions contains items relating to the use of emotions in problem-solving. The 3 subscale scores can be combined to give an overall EI score. The empathy scale was originally constructed for use with US medical students; a minor modification was applied to the scale for UK use, whereby the term 'physician' was replaced with 'doctor'. A previous study carried out with UK medical students indicated this modified scale to be highly reliable and to show a pattern of correlations with other variables that

would be expected for an empathy scale, suggesting its suitability for use with this student group.¹⁸ For the Year 2 subgroup, scores on the Scale of Physician Empathy obtained in Year 1¹⁸ were also available. The questionnaire also contained an optional section that allowed participants to indicate whether they were willing for their examination and coursework results to be accessed later, and to supply their student ID numbers to allow data matching. Information was available on end-of-year overall academic performance for all 3 year groups.

Procedure

Questionnaires were distributed at the start of lectures, when a brief explanation of the study was given. Completed questionnaires were either returned to an investigator at the end of the lecture or filled in later and returned to a collection box.

RESULTS

Internal reliabilities of the scales

Internal reliabilities (Cronbach's α) were good for the total EI and Physician Empathy scales (0.82, 0.88) and for the EI Optimism/Mood Regulation and Appraisal of Emotions subscales (0.71, 0.75). The Utilisation of Emotions subscale was slightly less reliable (0.66).

Gender differences

Table 1 shows EI full-scale and subscale scores and empathy scores for males and females in the whole sample and for each year group. Significant gender differences were found for the whole sample on EI, empathy and the Utilisation of Emotion subscale, with females scoring higher than males on all 3 scales ($t[268] = 3.23, P = 0.001$; $t[263] = 2.43, P = 0.016$; $t[268] = 3.52, P = 0.001$, respectively). There were no significant gender differences in end-of-year marks in any of the 3 year groups.

Comparison of Physician Empathy scores across year groups

In order to examine possible empathy differences amongst the Year 1, 2 and 5 groups, a 2-way (cohort \times gender) ANOVA was performed. There was a significant main effect of gender ($F[1,259] = 6.44, P = 0.012$) but not of year ($F[2,259] = 1.06, P = 0.35$, not significant [NS]), and a significant gender-year interaction ($F[2,259] = 5.91$,

Table 1 Mean (standard deviation) empathy and emotional intelligence scores for male and female students

| | Whole sample | | Year 1 | | Year 2 | | Year 5 | |
|-------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| | Male | Female | Male | Female | Male | Female | Male | Female |
| Empathy | 79.98 (9.85) | 82.76 (8.00) | 75.79 (11.32) | 84.21 (7.98) | 81.91 (9.65) | 81.72 (7.63) | 81.46 (7.55) | 81.91 (8.34) |
| EI | 150.25 (13.80) | 155.55 (11.87) | 150.92 (13.53) | 155.13 (13.05) | 149.91 (16.14) | 157.86 (10.87) | 150.00 (11.18) | 153.04 (10.76) |
| Opt/MR | 45.30 (5.03) | 46.20 (4.93) | 45.19 (5.08) | 46.72 (5.27) | 45.44 (5.76) | 46.86 (4.68) | 45.23 (4.10) | 44.44 (4.33) |
| Appraisal | 38.20 (5.58) | 39.43 (4.43) | 38.89 (5.11) | 38.96 (4.88) | 37.50 (6.57) | 39.91 (4.25) | 38.39 (4.73) | 39.54 (3.88) |
| Utilisation | 20.24 (3.17) | 21.74 (4.93) | 19.27 (5.08) | 22.03 (3.46) | 21.59 (2.96) | 21.48 (3.34) | 19.53 (2.75) | 21.63 (2.93) |

EI = emotional intelligence; Opt/MR = Optimism/Mood Regulation; Appraisal = Appraisal of Emotion; Utilisation = Utilisation of Emotion

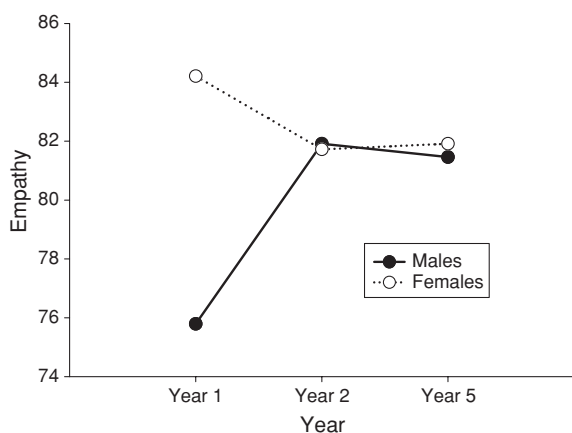


Figure 1 Scores on the Physician Empathy Scale for students in Years 1, 2 and 5

$P = 0.003$). These results are illustrated in Fig. 1, which shows increasing empathy levels in males between Years 1 and 2, whereas empathy in females declines. Post-hoc testing showed that the difference between male and female levels of empathy was only significant in Year 1 ($t[95] = 4.02, P < 0.001$). The difference in empathy levels between Year 1 and 2 males was significant ($t[54] = 2.18, P = 0.034$), and the difference for females showed a tendency towards significance ($t[135] = 1.86, P = 0.065$).

A repeated-measures ANOVA was also performed on the data for Year 2 students, using their current and previous (Year 1) scores; scores for both years were available for 70 students (24 males, 46 females). There was no significant main effect for year ($F[1,69] = 1.31, P = 0.26$ [NS]) or gender ($F[1,69] = 0.90, P = 0.35$ [NS]), but gender \times year was again significant ($F[1,69] = 6.12, P = 0.016$). These results are illustrated in Fig. 2. Paired sample t -tests showed that the increase in empathy in males was marginally significant, but the decline in females was non-significant ($t[23] = 1.95, P = 0.064; t[45] = 1.18, P = 0.25$, respectively).

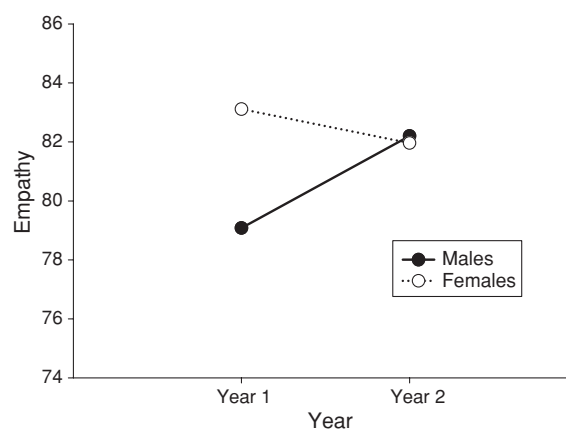


Figure 2 Scores on the Physician Empathy Scale for the same student cohort taken in Years 1 and 2

Taken together, these 2 analyses suggest different empathy trajectories for males and females between Years 1 and 2.

Correlations of EI and empathy with academic performance

There was little evidence of associations between total EI, EI subcomponents or empathy and academic performance, with no significant associations with end-of-year marks found for any of the year groups. For Year 1 students, the mark for an exercise involving communication skills ('Talking with Families') was, however, significantly correlated with total EI ($r = 0.20, n = 100, P = 0.05$). An interesting finding in Year 2 students was that the summed peer ratings for the 2 semesters (obtained when students rate each others' contributions to PBL groups) was positively and significantly correlated with both EI and the Appraisal of Emotions subscale, with the correlations being numerically identical ($r = 0.23, P = 0.03, n = 91$), suggesting that students who score high on EI, and those who are good at reading the emotions of others, are perceived by their peers to be more effective in these groups.

CONCLUSIONS

In this study, overall academic performance was found not to be associated with either EI or empathy in any of the year groups. There was an interesting finding for peer ratings in Year 2 PBL groups, showing that students who scored higher on EI and on the Appraisal of Emotion subcomponent tended to receive higher peer ratings. An interesting possibility for future study would involve examining how mean levels of EI, and also of personality traits, affect actual functioning of PBL groups. There is some evidence that mean group EI is positively related with performance in small-group problem-solving tasks,³⁰ but there have been no specific studies of medical student PBL groups in this context.

The cross-sectional and longitudinal analyses of empathy scores suggest different empathy trajectories for males and females, a result not found in studies with US cohorts. The results suggest that, for UK undergraduate medical students, a decline in empathy among females early in the course might be a cause for concern, but the early course experience seems to facilitate an enhancement of empathy in males. Further work would be required to establish the mechanisms underlying these results. One possible explanation, suggested by the convergence of male and female scores to a similar value as the course progresses, as is apparent in Fig. 1, is that students use the information acquired as they progress through the course to adjust their levels of empathy towards a perceived norm for effective functioning as a doctor. High empathy scorers may pick up from their course the message that they need to moderate their response to distress in others in order to be able to act effectively, whereas low scorers perhaps receive a different message about the need to take the patient's perspective into account more than they were initially inclined to do.

That students were self-selected for this study represents a limitation of the study because students were required to fill in the questionnaire and to allow access to their examination results. This is a source of potential bias in the results as, for example, it is possible that the more able and/or confident students would be more likely to participate. The participation rate in the present study was 46%, which is good for a voluntary questionnaire survey, but in future studies it would be desirable to explore means of encouraging higher participation rates.

The limitations associated with the use of self-report scales mean that it is impossible to determine from the present findings whether the reported empathy changes are truly internalised by students, or whether it is just the questionnaire responses that are adjusted. Interviewing selected students would clarify this point and would also allow us to engage with the intriguing idea that what is perceived as the norm for the level of doctor empathy might be shifted upwards or downwards by changing the ways in which issues around empathy and emotional skills are covered in the curriculum.

The present study was limited by being restricted to medical students at a single UK university and by the limitations of participant self-selection and self-report data, as discussed above. Undertaking further studies at other UK universities would be of interest in order to establish if the longitudinal and cross-sectional effects we observed are robust, or if there is a 'course' effect on empathy trajectories. It would also be of interest to study the impact of EI combined with other relevant variables, such as personality, on effective performance in non-traditional forms of study such as PBL.

Contributors: EA identified the questionnaires and supervised the analysis. PE identified the areas of the curriculum and the students. BM and KO'H distributed the questionnaires and completed the initial analysis. All authors contributed to writing the paper.

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