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# Medical Students' Specialty Preference Relative to Trait Emotional Intelligence and General Self-Efficacy

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## ABSTRACT

Medical students' specialty preference (SP) for future areas of expertise in the context of their profession has always been in focus of interest. The purpose of this study was fourfold: (i) To disclose medical students' SP; (ii) To reveal SP's underlying extrinsic, intrinsic or dual motivations; (iii) To assess medical students' trait emotional intelligence (EI), and general sense of perceived self-efficacy (GSE); (iv) To observe gender differences in SP choice. 93% out of 318 medical students completed questionnaires comprising 13 SP hints and student's underlying motivation for SP. By Trait Emotional Intelligence Questionnaire–Short Form and General Self-Efficacy Scale, students' personality characteristics were self-rated. By principal component analysis, the components 'working situation' (reflecting extrinsic motivation), 'specialty prospect' (suggesting intrinsic motivation) and 'Career Opportunity' (indicating dual motivation) were scrutinised. Students scoring high on trait EI and GSE were analysed separately. Male students prioritised surgical specialties (26%); female students preferred general practice (13.7%). Female students exhibited intrinsic motivation in Specialty Prospect; male students displayed extrinsic motivation in Career Opportunities. High trait EI-scoring male students surpassed high-scoring female students; high GSE-scoring male students exceeded high-scoring female students; also, in the total sum GSE as opposed to total sum of trait EI scores, where no gender difference emerged. Components specialty prospect and career opportunity related to students' trait EI and GSE. Family characteristics linked to students' trait EI and GSE along with their SP choice. In conclusion, male students prioritised surgical specialties as opposed to female students, who preferred general practice. The underlying motivation attracting a student to SP was revealed. Female students were intrinsically motivated, more so than male students, who displayed extrinsic ambition. High trait EI-scoring male students surpassed high-scoring female students, but

no gender difference was found in total EI sum. High GSE-scoring male students exceeded high-scoring female students, also in total GSE sum. Trait EI and GSE were non-interchangeable but complementary measures informative in medical education.

**Keywords:** *Emotional intelligence, General self-efficacy, EI, GSE, Medical education, Medical students, Curriculum, Specialty preference*

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## INTRODUCTION

A smaller quantity of trainees compared to previous years, enter directly into specialty education in UK. General practice and hospital medical specialties are well-liked areas with high fill rates, while psychiatry and non-medical specialties have the lowest fill rates (1). Identification of medical students' specialty preferences (SP), their related elements and students' personality traits help to explore underlying motives for choice of future area of expertise (2). Namely, basic psychological needs and drives translate into diverging motivations for SP (3) as well as input from family (4). Some doctors pick SP quickly (5); others postpone or pick the wrong SP and become "late transfers". Students are often motivated by prestige and money (6) but lack a joyful engagement in medicine per se (7).

Trait emotional intelligence (EI) comprises beliefs about one's emotions when verbalised in questionnaires and self-rating scales (8). The stable trait EI is usually unrelated to cognitive abilities but belongs into a personality framework in terms of the General Factor of Personality. High trait EI individuals perceive themselves as flexible and adaptable to their environment possessing emotional response control (8). In other words, doctors with high level of trait EI scores regulate their feelings of success and failure in affect-rich situations, better than those who have a low level of trait EI, and the former group are more inclined to experience job satisfaction (9).

Self-efficacy (SE) beliefs have been defined as specific to a task, situation or domain (10). Later a more General self-efficacy (GSE) concept was realised by Schwarzer and Jerusalem (11) and was operationalised as a non-specific personal competence in a variety of stressful situations (12). GSE beliefs enhance students' resilience and facilitate problem solving and academic achievement as well as increase critical thinking (13). GSE beliefs are found valid in predicting, e.g., students' activity preferences and emotional reactions as well as are subtle to alterations in students' self-regulated learning processes mediating academic successes (14).

Our present research questions are as follows:

1. Which are medical students' SP and which elements maneuver students' SP choice?
2. Which motivations underly the components working situation, speciality prospect and career opportunity and how do different kind of motivations contribute to medical students' SP choice?
3. How does trait EI reflect in medical student's SP?
4. How does GSE reflect in medical students' SP?
5. Are there gender differences in SP choices and personality traits?
6. Are trait EI and GSE interchangeable or complementary measures?

# METHODS

## Participants

A cross-sectional study among undergraduate medical students was performed. Altogether 318 medical students (56.6% female) were recruited from June 2017 to December 2017 from a single major medical school in the United Kingdom. Medical students completed questionnaires about demography and aspects impacting their choice of SP. Trait Emotional Intelligence Questionnaire – Short Form (TEIQue-SF) and General Self-Efficacy Scale (GSES) were completed during courses and after lectures (15, 11). The students were briefed about the study objective and informed that their participation was voluntary and could be halted at any time without reason. The students' participation and completed questionnaires constituted their informed consent.

## Questionnaires

### *Specialty preference (SP)*

Participants were asked to pick one from 13 SP. The list comprised Diagnostics (Clinical Pathology, Microbiology, Radiology), Emergency Medicine, Obstetrics and Gynaecology, Medical Specialities (e.g., Dermatology, Chest, Cardiology, Endocrinology, Gastroenterology, Neurology, Nephrology), Surgical Specialties (General Surgery, Vascular Surgery, Plastic Surgery, Special Ortopaedics, Urology, Otolaryngology ENT, Ophthalmology, Maxillofacial, Cardiothoracic), Psychiatry, Anaesthesia, Paediatrics, Public Health/Epidemiology, Basic Sciences (Anatomy, Physiology, Bacteriology, Biochemistry), General Practice, 'Other' and 'I do not know' (Figure 1).

## Factors Influencing Medical Students' SP

In total, 26 aspects influencing SP were reduced by Principal Component Analysis (PCA) to three components: working situation (comprising extrinsic motivation), speciality prospect (containing intrinsic motivation) and career opportunity (including dual motivations). The components' loadings are shown in Table 2. The students' levels of trait EI and GSE served as explanatory variables in multiple regression analyses to find out how much variances they uniquely and significantly explained of the components. Also family attributes, such as parental age and illness, prompt students' SP choice and were analysed (Tables 2–5).

## Trait Emotional Intelligence (TEIQue-SF)

Students' trait EI was assessed using TEIQue-SF. TEIQue-SF consists of 30 self-report questions with a 7-point range from 1 (completely disagree) to 7 (completely agree). For example "On the whole, I'm a highly motivated person", "I usually find it difficult to regulate my emotions". The TEIQue-SF provides reliable trait EI scores and is validated (15). The internal reliability by Cronbach's alpha was presently good (0.81).

## General Self-Efficacy (GSE)

By GSE students' general sense of perceived SE was self-rated (11). GSE can be malleable during lifespan and affects life choices, level of motivation, resilience and predisposition to stress and depression (10). The one-dimensional GSE scale comprises 10 statements e.g., "I can always manage to solve difficult problems if I try hard enough"; "I can remain calm when facing difficulties because I can rely on my coping abilities". They range from 1 (not at all true) to 4 (exactly true). Higher scores mean more SE. The GSE scale's composite score ranges from 10 to 40, and presently from 13 to 36 scores. GSE's internal reliability by Cronbach's alpha was currently acceptable (0.78).

### Statistics

The results were computed with IBM, SPSS software, version 24. To ensure the validity of the responses to the questionnaires, data collectors' intergroup difference was computed by One-Way ANOVA. No collector difference was found ($F < 1.499$, $p > 0.147$, $\eta^2 < 0.041$). The results were scrutinised by PCA, multiple linear regression analyses, Pearson correlations, independent *t*-tests (2-tailed) as well as by non-parametric Mann-Whitney U-test when considered appropriate.

## RESULTS

### Participants

Medical students from Year 1 to Year 5 (11% studied at Year 1, 18% at Year 2, 34% at Year 3, 33% at Year 4 and 4% at Year 5) were recruited. Altogether 295 (93%) of the completed questionnaires were considered valid. Seventy nine percent (79%) of students were British, 12% were Asians, 8% Europeans and 1% Africans and Middle Eastern.

Motivational aspects influencing medical students' SP and gender differences in these are denoted in Table 1.

### Participants' SP

The medical students picked their SP (Figure 1). Male students favoured surgical specialties, and female students favoured general practice; No gender difference was found ($U = 101.5 > U = 72$ at $p < 0.05$). Female students interested in surgical specialties, compared to female students with no interest in these fields, were more career driven ($M = 18.03$ [4.16] and $M = 16.03$ [3.61], $t[125] = 2.635$, $p < 0.01$). Male aspiring for obstetrics and gynecology was career driven ($M = 25.00$ [0.0] more so than those not interested in this area ($M = 16.48$ [3.79], $t[125] = 2.238$, $p = 0.027$). Female students aspiring for obstetrics and gynecology were extrinsically motivated in terms of preference for working situation ($M = 36.00$ [7.02], more so than those female students drawn to paediatrics ($M = 30.24$ [6.19], $t[32] = 2.506$, $p = 0.017$). Altogether 17.3% male students and 21.7% female students did not predict their SP (Figure 1).

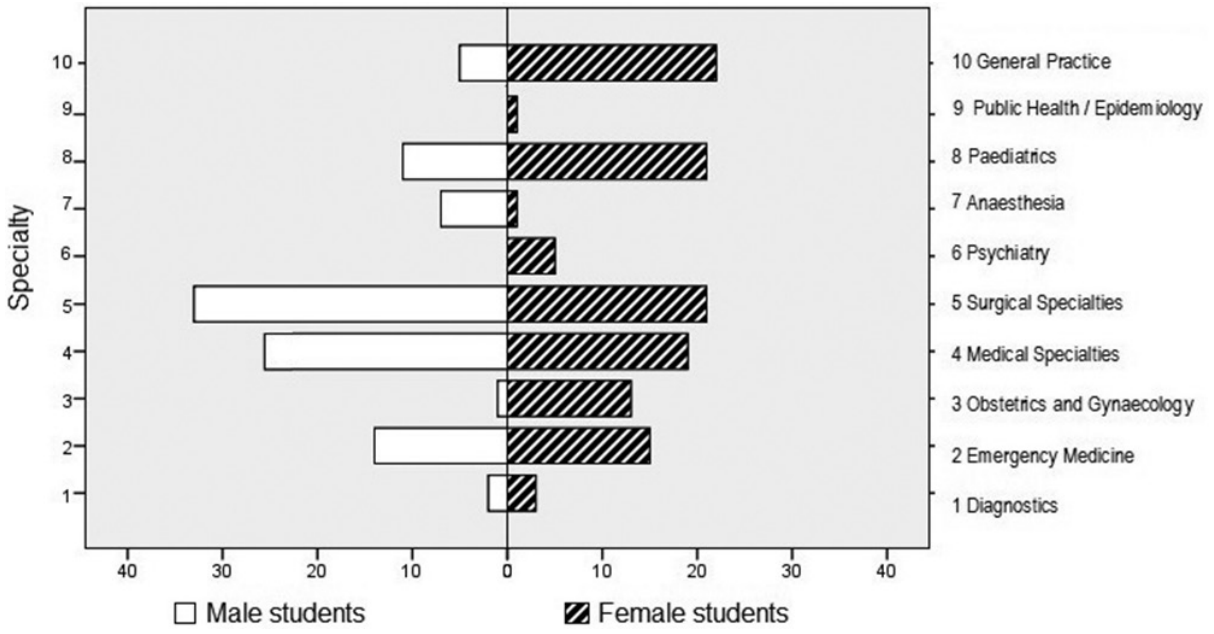


**Figure 1:** Male and female medical students' specialty preferences.

**Table 1:** Principal component analysis of aspects influencing medical students' speciality preference and gender difference in the components[1,2]

| Working Situation (Extrinsic motivation) | Specialty prospect (Intrinsic motivation) | Career Opportunity (Intrinsic + extrinsic motivation) | Component content | Component and gender | M (SD) | t(df) | $p \leq$ |
|---|---|---|---|---|---|---|---|
| 0.777 | | | Lifestyle of the residency/call schedule | Working Situation | | | |
| 0.737 | | | Ease of joining the specialty residence | Male | 33.63 (7.64) | t(285) | n.s. |
| 0.737 | | | Work–life balance | Female | 34.53 (6.86) | 1.041 | |
| 0.727 | | | Length of residence programme | | | | |
| 0.687 | | | Life-style of practice | | | | |
| 0.609 | | | Location | | | | |
| 0.593 | | | Transport links | | | | |
| 0.577 | | | Potential earnings and good salary | | | | |
| 0.491 | | | Job opportunity after education | | | | |
| 0.419 | | | Spouse's or partner's career | | | | |
| | 0.704 | | Patient-contact quantity | Speciality Prospect | | | |
| | 0.692 | | Intellectual satisfaction or interesting content | Male | 27.50 (4.36) | t(286) | .000 |
| | 0.661 | | Rewarding career | Female | 29.56 (3.91) | 4.183 | |
| | 0.605 | | Own aptitude and skills | | | | |
| | 0.546 | | Happy life | | | | |
| | 0.532 | | Interaction with other physicians | | | | |
| | 0.511 | | Patient-contact continuity | | | | |
| | | 0.706 | Prestige of area of expertise | Career Opportunity | | | |
| | | 0.692 | Research opportunity | Male | 16.55 (3.85) | t(283) | .003 |
| | | 0.687 | Intellectual challenge of a specialty | Female | 15.23 (3.54) | 3.028 | |
| | | 0.513 | Career prospects | | | | |
| | | 0.460 | Encouragement by professor or by family | | | | |

Notes: [1]Extraction Method: Principal Component Analysis; [2]Rotation Method: Oblimin with Kaiser Normalisation.

## Factors Influencing SP: PCA

The 26 elements speculated to impact students' choice of SP, were reduced by PCP to 22 after inspection of Kaiser-Meyer Olkin value (0.77 and > 0.6) along with Bartlett's Test of Sphericity ($p$ = 0.000) which both tests supported the use of PCA. Of communalities, four correlation coefficients stayed below .30 and therefore deleted. The scree plot revealed a break after the third component and by using Catell's (16) scree test, three components involving 22 elements were retained. Their eigenvalues exceeded each 2 (>1) explaining 22.1%, 12.9% and 10.2% of the variance. To interpret the components with a total of 45.2% combined variance, oblimin rotation was performed and the surfaced components are shown in Table 1. Their intercorrelations are as follows: Working situation correlated with speciality prospect: $r_{(291)} = .198$ ($p < 0.001$); working situation correlated also with career opportunity: $r_{(294)} = 0.262$ ($p < 0.000$) and specialty prospect correlated with career opportunity: $r_{(291)} = 0.138$ ($p = 0.018$). The components speciality prospect and career opportunity comprised gender differences and can be computed separately (Table 1).

## Emotional Intelligence (EI)

The medical students' trait EI scores were normally distributed and ranged from 104 to 204 scores. Trait EI scores within 130 to 154 are normal, a low trait EI quote persists of <129 scores and a high trait EI quote is specified by >155 scores. The total sum of trait EI scores yielded no gender difference. Nevertheless, 57 male students scored high (>155) on trait EI (M = 168.88 [SD = 10.38]) and when compared to high-scoring female students ($n$ = 86, trait EI: M = 165.31 [SD = 9.32]), the male group exceeded the female group (t[141]= 2.142, $p < 0.034$). High trait EI scores correlated with high GSE scores (>21), $r_{(147)} = 0.31$ and also the total sum of trait EI correlated with the total sum of GSE ($r_{(295)} = 0.37$).

Students differ in motivation and are influenced by family characteristics during early years. Parents' comorbidities and mothers' ages were not significant, as opposed to father's age ($n$ = 295) when grouped as follows: 37% < 52, 28% = 53–56 and 32% > 57 years. A linear regression analysis was computed with the predictors: constant; Career opportunity; Speciality prospect; father's age and sum of GSE for the explained variance in the dependent variable EI sum. The model summary indicated with model ENTER and the mentioned predictors as follows: R = 0.481, $R^2$ square = 0.232, adjusted $R^2$ square = 0.220 and SE estimate = 14.61. The model was highly significant (F[4,274] = 20.26, $p < 0.001$) and lacked multicollinearity (Table 2). It was revealed that $R^2$ explained significantly 23.2% of the variance in trait EI; each predictor's contribution to the variance was calculated by squaring the part correlations from which the shared variance in $R^2$ is removed. GSE contributed with 16% to the variance of trait EI. The model showed that a medical student's trait EI was communicated uniquely and significantly by the components speciality prospect and career opportunity as well as by father's age (Table 2).

## General Self-Efficacy (GSE)

The students' GSE scores were as follows: M = 27.85 (SD = 3.29). High GSE scores (M = 28.95 [SD = 2.84]), correlated with high trait EI scores (>155) $r_{(147)} = 0.31$. Males with high trait EI scored also higher on GSE (M = 29.88 [SD = 3.25]) than females with high trait EI did in respect to GSE (M = 28.37 [SD = 2.39]; $t$[95, 16] = 3.003, $p$ = 0.003). The total sum of GSE, ranging from 13 to 36 scores, yielded the same gender difference: Male students ($n$ = 127) scored higher on the total sum of GSE (M = 28.52 [SD = 3.34]) than female students ($n$ = 161; M = 27.28 [SD = 3.14]; $t$[286] = 3.234, $p$ = .003).

**Table 2:** Regression model revealing the predictors' weight in their contribution to medical students' emotional intelligence

| Model ENTER | | Unstandardised Coefficients | | Standardised Coefficients | *t* | *P* < | Correlation | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|---|
| | | B | SE | Beta | | | Part | Tolerance | VIF |
| 1 | (Constant) | 74.668 | 10.70 | | 6.982 | 0.000 | | | |
| | Father's age (grouped) | 2.539 | 1.05 | 0.130 | 2.426 | 0.016 | 0.128 (2%) | 0.98 | 1.02 |
| | Component speciality prospect | 0.993 | 0.23 | 0.237 | 4.415 | 0.000 | 0.234 (5%) | 0.97 | 1.03 |
| | General self-efficacy (Sum) | 2.124 | 0.28 | 0.408 | 7.590 | 0.000 | 0.402 (16%) | 0.97 | 1.03 |
| | Component career opportunity | –0.851 | 0.24 | –0.190 | –3.538 | 0.000 | –0.187 (3%) | 0.97 | 1.03 |

Note: Predictors: Constant, Father's age; Component speciality prospect ; General self-efficacy (Sum) and component career opportunity; Dependent variable: Emotional intelligence

To answer the questions which component best explains a student's GSE: specialty prospect or career opportunity along with student's level of trait EI and/or family characteristics in form of father's illness, a linear regression analysis with the predictors: constant; career opportunity; specialty prospect; father's illness and sum of EI for the explained variance in the dependent variable of GSE sum was performed. The model summary indicated with model ENTER and the mentioned predictors as follows: R = 0.480, $R^2$ = 0.231, adjusted $R^2$ = 0.220 and SE estimate = 2.92. The model was highly significant (F [4,281] = 21.05 $p < 0.001$) and lacked multicollinearity (Table 3). Consequently, the created full model revealed a $R^2$ explaining significantly 23.1% of the variance in GSE. The squared part correlations showed that trait EI contributed with 19% to the variance in GSE. The specialty prospect and career opportunity components as well as father's illness contributed uniquely and significantly to GSE (Table 3).

## DISCUSSION

Medical students' SP revealed gender differences. Males' common SP were surgical specialties with a male:female ratio of about 5:3. Female students' popular SP was general practice (GP) with a male:female ratio of about 1:3. Our results agreed with outcome from Lambert et al. (1) and Cleland et al. (17) that males were more likely than females to select surgery as a top choice and the latter were more likely to select general practice. Males were also less likely to select obstetrics and gynaecology or paediatrics, in agreement with our present results where female students clearly preferred these areas (1, 17). The Royal College of General Practitioners specified that UK needs at least 10,000 more GPs by year 2022 to meet the population's health needs (18). In contrast, psychiatry has the lowest specialty fill rate (19). Internationally, 4.5% of medical students consider psychiatry as their SP (20). We found that 0% of the current male students in contrast to 3% of the females considered psychiatry as their SP although Lambert et al. (1) found 2015 that the psychiatry male:female ratio was 5.5 versus 5.4.

We currently answered the question what type of motivation underlies a student's choice of SP. Explicitly, Komarraju et al. (21) documented a number of significant relationships between personality, intrinsic and extrinsic motivation, and academic achievement and provided a foundation for our research to offer educators an insight into how motivation relates to students' personality relative to academic achievement. Namely, the trait EI belongs into the personality framework in terms of the General Factor of Personality (8–9). We disclosed that females were in general more drawn to intrinsically motivated SP; they are also more doctor-patient oriented compared to males (22). Students highly intrinsically motivated to accomplish are likely to be self-disciplined, organised, attending class, and studying systematically (21). Exceptionally females aspiring for obstetrics and gynecology were currently extrinsically motivated in term of working situation, more so than females choosing paediatrics as their SP. Presently, males pursuing surgical specialties, scored higher on career opportunity, that is, they were both intrinsically and extrinsically motivated for their SP (cf. 1, 17). Extrinsically motivated students look for external sources of support, they need external rewards for hard work. Educators can use this knowledge in ways that expands their motivation (21). However, final-year medical students have been found to revise their motivation from being extrinsically to become more intrinsically motivated with more focus on relief of patient's sufferings (6). This could mean that students are likely to forgo state-induced temporary impulse and return to their innate values when they after trial and error orient towards their final SP (5–8).

**Table 3:** The explained variance of the significant predictors of medical students' general self-efficacy is indicated in squared part-correlations in the linear regression model.

| Model ENTER | | Unstandardised Coefficients | | Standardised Coefficients | *t* | *P*< | Correlation | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|---|
| | | B | SE | Beta | | | Part | Tolerance | VIF |
| 1 | (Constant) | 14.49 | 2.16 | | 6.710 | 0.000 | | | |
| | Component speciality prospect | –0.167 | 0.05 | –0.196 | –3.587 | 0.000 | –0.188 (4%) | 0.92 | 1.08 |
| | Component career opportunity | 0.187 | 0.05 | 0.209 | 3.879 | 0.000 | 0.203 (4%) | 0.94 | 1.06 |
| | Emotional intelligence (sum) | 0.090 | 0.01 | 0.457 | 8.407 | 0.000 | 0.440 (19%) | 0.93 | 1.08 |
| | Father's illness | 0.726 | 0.32 | 0.122 | 2.304 | 0.022 | 0.121 (1%) | 0.97 | 1.03 |

Note: Predictors: Constant, Component Speciality prospect; component Career opportunity; Emotional intelligence (sum) and father's illness; Dependent variable: General self-efficacy (GSE)

Petrides et al. (23, 24) observed that higher levels of trait EI links to better mental and physical health. Weng et al. (25) revealed that higher self-rated EI in doctors was significantly associated with higher job satisfaction and less burnout. Presently, we assessed students' trait EI although its value as predictor of academic success was earlier debated (23). Then, Suleman et al. (26) disclosed a strong positive relationship between EI and academic success among undergraduate students. The researchers showed that self-development, emotional stability, managing relations, altruistic behaviour and commitment, predict academic success. In addition, Agnoli et al. (9) found that trait EI regulates the impact of triumph and crisis on performance in affect-rich circumstances, for example, when individuals are asked to help others in need. Medical staff-members are always asked to help people in need and therefore we considered this personality trait to be in harmony with our research purpose. Currently, we disclosed a group of high-scoring male medical students on trait EI (>155 scores; M = 169 [SD = 10]) and compared them to high-scoring females (M = 165) [SD = 9]); the male group scored higher and are, based on this result, expected to use healthier and more effective emotion regulation mechanisms protecting them from burn-out (25). Then again, when we computed the total sum of trait EI scores of all medical students, no gender difference was emerged as opposed to that of total GSE sum.

The predictive value of self-efficacy beliefs on motivation and performances has been in focus of interest in academic settings, where researchers have tried to verify it (13). Our students scoring high on trait EI, also scored high on GSE, which supports the idea that GSE complements well trait EI assessments. When we assessed students' GSE, males scored higher than females in agreement with a previous finding (27). Success creates a healthy confidence in one's own efficacy. Failure challenges it, especially if failure occurs before a sense of self-efficacy is securely developed (13, 14). However, in our study also the sum of trait EI scores correlated with the sum of GSE scores, which fact helps many medical students to adjust their performance in affect-rich situations, which they are likely to confront almost daily.

## Implications of the Study

Trait EI and GSE are separate but useful complements. By adding a measure of motivation, e.g., Motivated Strategies for Learning Questionnaire (MSLQ) (28) for medical students in the entrance examination, their underlying motivational study-orientation could surface and help them to select their correct SP later. Namely, it is suggested that students with high intrinsic motivation to accomplish may achieve their greater academic success by manifesting self-disciplined, organised, attending class, and studying systematically (21).

Furthermore, 12% of medical students show over-confidence versus 8.3% demonstrating under-confidence in factual knowledge (29). By promoting attention to details for over-confidence and boosting self-efficacy beliefs in under-confidents students, the reliability of their medical judgement in future professional life can be increased. Trait EI can be improved even in adult persons. Experiences may modify personality traits across the life span (30). The average improvement of EI, as measured by TEIQue is calculated to be 12.4% (31). Trait EI training improves health, enhances well-being and enriches social relationships along with work achievement (32, 33). Currently, students' trait EI and GSE scores constituted non-interchangeable entities but can be used as complementary measures to predict academic success in medical studies.

## Strength and Limitations of the Study

This cross-sectional study has an excellent response rate 91%. It also comprises measures of personality traits (11, 15)

related to SP and motivational aspects for a certain area of expertise in the medical profession (21). A limitation of the research consists of collecting medical students from one major single centre, but the good sample size compensates for this limitation. Cleland et al. (17) did not find in their research statistically significant differences across year groups so the data were merged for analysis for some study years which we also found justified when randomising students over different educational year groups. Furthermore, potential limitations consist of self-ratings, although self-ratings are recommended for assessments of personality traits (22), as we must speculate about the students' self-knowledge (29), because it is known that 12% of medical students show over-confidence and 8.3% demonstrating under-confidence in realistic knowledge (30). Consequently, this cross-sectional study would benefit from a follow-up after 5–6 years to determine if a student's SP is realised and constitutes a rewarding choice of career.

## CONCLUSION

Male medical students favoured surgical specialties, while females preferred general practice as their future area of expertise. Gender difference was found in the intrinsically motivated PCA factor 'Specialty prospect' with female students being, more so than male students, doctor-patient oriented, for example by choosing paediatrics. Medical students' trait EI was communicated significantly by the components 'specialty prospect' and 'career opportunity' as well as explained by father's age. Trait EI contributed to the prediction of the variance in GSE. In agreement, 'specialty prospect' and 'career opportunity' as well as father's illness contributed significantly to GSE. Yet, trait EI and GSE are non-interchangeable entities but complement each other well and may both provide information about a student's motivation and success in academic achievement.

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