BMJ Open Preliminary study of the relationship between career choice motivation and understanding of professionalism in newly enrolled medical students in China: a cross-sectional study

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ABSTRACT

Objectives Early professionalism education for first-year students is important for generating sound knowledge and attitudes towards medical professionalism. Of the many factors affecting professionalism and professional identity formation in medical students, career choice motivation is an understudied one. This study aimed to explore the relationship between the career choice motivations of first-year medical students and their understanding of professionalism.

Settings and participants A cross-sectional survey of 940 first-year clinical medicine students was conducted at China Medical University in September 2017 to explore students' motivation to study medicine and its relationship with students' understanding of professionalism. Demographics, career choice motivation and professionalism were obtained through paper questionnaires. Logistic regression analysis was used to analyse the association between career choice motivation and understanding of professionalism while controlling for potential demographic confounders.

Results The most common career choice motivations for first-year medical students (N=843) were *interested in the health sciences, income and social status and advocating altruism*. The most mentioned subdimensions of professionalism were *accountability, pursuit of excellence and compassion*. There were significant differences in the understanding of professionalism among students with different career choice motivations.

Conclusion First-year medical students with different motivations to study medicine also have different understandings of professionalism. Medical educators can explore motivations to learning medicine as a new entry point to providing professionalism education for newly enrolled medical students.

INTRODUCTION

Professionalism is a core competency that enables healthcare workers to perform their duties, adhere to ethical principles and demonstrate sensitivity to a diverse patient population.¹ Knowledge and understandings of professionalism have profound influences

Strengths and limitations of this study

- This study specifically focused on medical students in the early stage of the medical school.
- The professionalism was asked with open-ended questions, which helped to minimise the influences caused by fixed questionnaire items.
- Categorical variables were used to allow for logistic regression analysis and to improve the validity and practicality of the results.
- The study was limited by its cross-sectional design, and reflective results were used as key factors, which may affect the generalisability of this study.
- The types of motivations were not collected in a ranked and sequenced way, which made it impossible to determine the relative importance of motivations.

on a medical student's competence, including the formation of professional identity.² When examining 'empathy' as a subdimension of professionalism,³ it was discovered that there existed a correlation between medical students' career choice motivations and their empathy. This now begs the questions of whether or not career choice motivations have any relationship with professionalism as a whole. As of the writing of this article, there has been limited evidence on this in the internationally available literature.

From the perspective of humanism, career choice motivation and professionalism share similar factors, but further research is required to understand the relationship between them. Career choice motivation for medical students can be defined as 'the student's motivation for pursuing a medical career when entering medical school'.^{4 5} A review of motivational factors showed that the main motivators to students' selection of medical study in recent years could

Table 1 Characteristics of the first-year medical students (N=843)

Variable	n (%)
Gender	
Male	361 (42.82)
Female	482 (57.18)
Duration of the medical programme (years)	
5	644 (76.39)
8	199 (23.61)
Household registration area	
Rural	572 (67.85)
Urban	256 (30.37)
Missing	15 (1.78)
Annual household income (¥)	
≤20 000	171 (20.28)
20 000–50 000	201 (23.84)
50 000–100 000	386 (45.79)
≥100 000	60 (7.12)
Missing	25 (2.97)
Fathers' educational level	
Junior high school and below	265 (31.44)
High school	255 (30.25)
University degree	312 (37.01)
Missing	11 (1.30)
Fathers' occupation*	
Legislators, senior officials and managers	171 (20.28)
Professionals, technicians and associate professionals	121 (14.35)
Clerical support workers	48 (5.69)
Service and sales workers	117 (13.88)
Skilled agricultural, forestry and fishery workers	103 (12.22)
Craft and related trades workers, plant and machine operators and assemblers	78 (9.25)
Other	192 (22.78)
Missing	13 (1.54)

*Based on the International Standard Classification of Occupations (ISCO-08)⁴⁶

be categorised into three major dimensions: science, society and humanitarianism.⁶ In addition, motivators for medical students' career choices also included interesting illnesses, opportunities for private practice and patient access.⁷ Students' understanding of professionalism is inseparable from the accumulation of scientific knowledge and the influence of social concepts.⁸ Furthermore, the core of medical humanism involves listening, empathy, communication and other interpersonal skills,⁹ all of which are subdimensions of professionalism as a whole.¹⁰ Further research is required to understand the relationship between these factors, particularly in various scenarios, environments and populations. To better understand how career choice motivators and initial

understanding of professionalism are related, without the influence of professionalism education in medical school, newly enrolled first-year medical students who are at the beginning of their medical careers were favoured as the target study population.

The first year of medical school has proven to be an important period to receive professionalism education and to address any career challenges that may arise.¹¹ A recent study focused on newly enrolled first-year medical students by Ommering *et al*¹² had suggested that the first year may be a reasonable period for understanding students' motivations. With this in mind, some medical schools have improved students' understanding of professionalism by integrating discussions on professionalism as part of the first-year curriculum.¹¹ A study of medical ethics in first-year students suggested that the early days of medical school could be an effective period for developing moral reasoning skills,¹³ which was also stressed as an aspect of professionalism.

This study aimed to explore the relationship between the career choice motivations of first-year medical students and their understanding of professionalism. To our knowledge, there has been little research to date on this topic, so this was an exploratory attempt to understand the correlation and to shed light on the cultivation and improvement of medical students' professionalism.

METHODS

Participants

All of the 940 first-year clinical medicine students at China Medical University were invited to participate in this study in September 2017. Full instructions were given to students before filling out the three-part questionnaire, following which students completed the questionnaires in the classroom. Participation was voluntary, and all student participants filled out an informed consent form.

Patient and public involvement

No patient was involved in this study.

QUESTIONNAIRE

Demographics

A demographic questionnaire was used to collect information on participants' sex, household registration area (urban/rural), durations of medical programme, parents' educational levels, parents' occupations and annual household income. The household registration area (urban or rural) is an assigned residence registration system for all Chinese residents on birth or attaining citizenship.¹⁴ Durations of medical programmes usually comprise two major streams: a 5-year bachelor's degree programme or an 8-year bachelor's and master's combined program.¹⁵ The questionnaire is shown in online supplemental appendix I.

Career choice motivation

Career choice motivations of first-year medical students were obtained by means of a single multi-select question,

Table 2 First-year medical students' career choice motivations (N=843)

Career choice motivations	n (%)
Interest in the health sciences	399 (47.33)
Income and social status	385 (45.67)
Advocating altruism	337 (39.98)
Family member in healthcare	257 (30.49)
Parents' expectations or illness in the family	182 (21.59)
Other motivations	9 (1.07)

where students were able to choose all options that applied. The options were as follows: (1) income and social status, (2) family member in healthcare, (3) advocating altruism (relieve the dying or rescue the wounded), (4) interested in the health sciences, (5) parents' expectations or illness in the family (desire to care for a family member) and (6) other motivations (students were asked to specify). The question on career choice motivation was based on the instrument called 'Career Choice Motivation' by Pagnin *et al.*⁵ which referenced the existing theories on motivation.^{16 17}

Professionalism

First-year medical students' understandings of professionalism were obtained using an open-ended question: 'What do you think professionalism in healthcare encompasses?' Using open-ended questions to measure professionalism removed potential ceiling effects that may seriously affect survey results and could more accurately reflect students' true views on professionalism.¹⁸

Responses were then coded and classified according to the evaluation framework and instrument for the medical professionalism of Chinese physicians.¹⁹ This professionalism framework was based on CiteSpace cluster analysis of literature on medical professionalism assessment from the past 15 years. The result was four primary dimensions which were then subdivided into seven secondary

dimensions: (1a) compassion, (1b) respectfulness, (1c) collaboration; (2a) integrity, (2b) accountability; (3) pursuit of excellence and (4) fair and ethical stewardship of healthcare resources. It was constructed from the perspective of a systematic framework and was the result of cultural adaptation and validation in Chinese medical students.

Data analysis

Career choice motivations were collated as dichotomous variables. Four researchers coded students' responses on their understanding of professionalism, which were then mapped to the professionalism framework.¹⁹ Coders were first required to read and understand the professionalism framework. When uncertainties in coding or classification arose, all coders came into joint discussion until a unanimous decision was reached. For example, the variable *accountability* was assigned a value of 1 or 0 based on whether or not there was discourse of accountability in the student's response. Each variable was dichotomous in nature (1, if mentioned; 0, otherwise).

Logistic regression models were used to explore the relationship between first-year students' motivation to study medicine and their understanding of professionalism. From model 1 to model 3, 'career choice motivations', 'individual characteristics' and 'family characteristics' were gradually introduced into the regression in order to observe the influence of control variables on the regression results. Due to the multi-collinearity of both fathers' and mothers' educational levels and occupations, only fathers' characteristics were controlled in the statistical analysis. After the questionnaire was collected, Epidata 3.1 was used for digital data entry. This was done twice to prevent errors. Descriptive statistics were computed for study variables, which were presented as numbers and percentages. Missing data of control variables were filled in via multiple interpolations. All statistical analyses were performed using Stata V.13 (StataCorp), and the level of significance was set at $p < 0.05$ (two tailed).

RESULTS

A total of 843 first-year medical students completed the questionnaires, yielding a response rate of 89.68%. Nearly 60% of the respondents in this study were female. The majority (76.39%) of students belonged to the 5-year clinical medicine programme. Students' fathers' educational levels were evenly distributed and fathers had varying occupations. Annual household incomes were mostly less than ¥100 000 (equivalent to about US\$15 000 at the time of this study). Additional baseline characteristics of the participants are shown in table 1.

Table 2 shows the results of first-year students' career choice motivations. *Interest in the health sciences* (47.33%), *income and social status* (45.67%) and *advocating altruism* (39.98%) were main motivators to students choosing to study medicine. Family-related factors such as *family member in healthcare* and *parents' expectations or illness in the*

Table 3 First-year medical students' understanding of professionalism (N=843)

Professionalism dimension	n (%)
Dimension 1	
Compassion	460 (54.57)
Respectfulness	102 (12.10)
Collaboration	142 (16.84)
Dimension 2	
Integrity	349 (41.40)
Accountability	655 (77.70)
Dimension 3	
Pursuit of excellence	532 (63.11)
Dimension 4	
Fair and ethical stewardship of healthcare resources	56 (6.64)

Table 4 Logistic regression analysis between *compassion* and career choice motivations (N=843)

Variable	Compassion, OR (95% CI)		
	Model 1†	Model 2‡	Model 3§
Interest in the health sciences	1.50 (1.14 to 1.99)*	1.44 (1.08 to 1.92)*	1.43 (1.07 to 1.92)*
Income and social status	0.93 (0.71 to 1.23)	0.86 (0.64 to 1.14)	0.87 (0.65 to 1.16)
Advocating altruism	1.35 (1.02 to 1.79)*	1.33 (1.00 to 1.78)*	1.32 (0.98 to 1.78)
Family member in healthcare	0.89 (0.66 to 1.2)	0.89 (0.65 to 1.22)	0.86 (0.63 to 1.19)
Parents' expectations or illness in the family	0.80 (0.57 to 1.12)	0.83 (0.59 to 1.17)	0.85 (0.60 to 1.21)
Gender			
Male		1	1
Female		1.16 (0.87 to 1.56)	1.15 (0.86 to 1.55)
Duration of the medical programme (years)			
5		1	1
8		3.27 (2.27 to 4.70)*	2.96 (1.95 to 4.51)*
Household registration area			
Rural		1	1
Urban		1.08 (0.79 to 1.47)	1.25 (0.84 to 1.84)
Annual household income (¥)			
≤20 000			1
20 000–50 000			1.69 (1.10 to 2.60)*
50 000–100 000			1.54 (1.02 to 2.32)*
≥100 000			2.07 (0.94 to 4.55)
Fathers' educational level			
Junior high school and below			1
High school			1.08 (0.72 to 1.63)
University degree			1.33 (0.82 to 2.14)
Fathers' occupation			
Legislators, senior officials and managers			1
Professionals, technicians and associate professionals			1.61 (0.97 to 2.66)
Clerical support workers			1.83 (0.92 to 3.65)
Service and sales workers			1.28 (0.75 to 2.19)
Skilled agricultural, forestry and fishery workers			1.44 (0.75 to 2.78)
Craft and related trades workers, plant and machine operators and assemblers			1.34 (0.72 to 2.49)
Other			1.81 (1.09 to 3.01)*

*p<0.05.

†Only career choice motivation was included.

‡Career choice motivation and individual characteristics were included.

§Career choice motivation, individual characteristics and family characteristics were included.

family had less influence on students' decisions to study medicine, at 30.49% and 21.59%, respectively.

First-year medical students' understandings of physician professionalism are shown in table 3. From student responses, *accountability* was mentioned by the majority (77.70%) of the students. Both *compassion* (54.57%) and *pursuit of excellence* (63.11%) were mentioned by more than half of the students. However, less than 20% of the students mentioned *respectfulness* (12.10%) or *collaboration* (16.84%) in their answers, and only 56 (6.64%) students mentioned the *fair and ethical stewardship of healthcare resources*.

To demonstrate the effects of the regression models, table 4 shows the logistic regression between one of the seven dimensions of professionalism, *compassion*, and motivations to study medicine. Career choice motivations, personal characteristics and family characteristics were gradually introduced into the regression from model 1 to model 3. Regression results showed that students motivated by *interest in the health sciences* were significantly more likely to think of *compassion* than other students, and the significance of the regression relationship did not change with the gradual introduction of control variables. In

Table 5 Logistic regression analysis between career choice motivations and the understanding of professionalism in first-year medical students (N=843)

Career choice motivation	Compassion		Respectfulness		Collaboration		Integrity		Accountability		Pursuit of excellence		Fair and ethical stewardship of healthcare resources	
	OR (95% CI)		OR (95% CI)		OR (95% CI)		OR (95% CI)		OR (95% CI)		OR (95% CI)		OR (95% CI)	
Interested in the health sciences	1.43 (1.07 to 1.92)*		1.06 (0.68 to 1.63)		0.97 (0.66 to 1.42)		0.84 (0.63 to 1.12)		1.19 (0.84 to 1.68)		1.08 (0.80 to 1.44)		1.24 (0.68 to 2.26)	
Income and social status	0.87 (0.65 to 1.16)		0.82 (0.53 to 1.28)		0.84 (0.57 to 1.23)		0.91 (0.68 to 1.21)		1.06 (0.75 to 1.50)		1.04 (0.77 to 1.39)		0.49 (0.27 to 0.91)*	
Advocating altruism	1.32 (0.98 to 1.78)		1.39 (0.90 to 2.15)		1.46 (0.99 to 2.13)		1.20 (0.90 to 1.61)		0.99 (0.70 to 1.40)		0.91 (0.67 to 1.22)		0.50 (0.26 to 0.96)*	
Family member in healthcare	0.86 (0.63 to 1.19)		1.10 (0.68 to 1.79)		1.40 (0.92 to 2.11)		0.87 (0.64 to 1.20)		1.04 (0.71 to 1.52)		1.11 (0.80 to 1.53)		1.32 (0.70 to 2.48)	
Parents' expectations or illness in the family	0.85 (0.60 to 1.21)		0.91 (0.53 to 1.57)		1.57 (1.01 to 2.44)*		1.24 (0.88 to 1.74)		1.12 (0.74 to 1.70)		1.11 (0.78 to 1.58)		1.09 (0.53 to 2.21)	

*p<0.05; career choice motivations, individual characteristics and family characteristics were included in the regression analysis.

model 3, students motivated by an *interest in the health sciences* were 43% more likely than other students to mention *compassion* (OR=1.43; 95% CI= 1.07 to 1.92).

Table 5 shows the logistic regression results of all of the dimensions of professionalism and career choice motivations of first-year medical students based on model 3, where personal and family characteristics were controlled. Students whose medical motivation was *interest in the health sciences* were 43% more likely to mention *compassion* (OR=1.43; 95% CI=1.07 to 1.92) than others. Students who chose to study medicine because of *income and social status* or *advocating altruism* were only about half as likely as other students to mention *fair and ethical stewardship of healthcare resources* (OR=0.49; 95% CI=0.27 to 0.91 and OR=0.50; 95% CI=0.26 to 0.96, respectively). Students who selected *parents' expectations or illness in the family* as a motivation were 57% more likely to mention *collaboration* than other students (OR=1.57; 95% CI=1.01 to 2.44).

DISCUSSION

In this study, there was a significant relationship between career choice motivations and understanding of professionalism in Chinese medical students. Logistic regression analysis showed students who chose to study medicine because of *interest in the health sciences* not only mentioned more dimensions of physician professionalism but mentioned *compassion* more than others. In terms of *fair and ethical management and use of medical resources*, both students who were motivated by *income and social status* and those who were motivated by *advocating altruism* tended to be half as likely as others to mention this dimension. Students whose medical motivations were family oriented (*parents' expectations or illness in the family*) were more likely to mention *collaboration*.

In this study, results did not show any dominant career choice motivation (one which accounted for more than 50% of students). This may have been because the career choice motivations in this study were obtained through a multi-select questionnaire. Students were able to choose multiple career choice motivations at the same time. In this study, *interest in the health sciences* was the top motivation of first-year medical students. According to self-determination theory, 'interest' belongs to autonomous motivation, which refers to motivation that arises from true interest or personal recognition or attention to an activity.²⁰ Studies had pointed out that autonomous motivation was considered to bring better quality of learning, creativity, performance, persistence, resilience, happiness and lifelong learning.^{21–23} At the same time, self-efficacy has proven to be an important factor in motivation.²⁴ Self-efficacy may be defined as a person's self-awareness and self-confidence in successfully completing tasks and achieving goals.²⁵ People who believe that they can handle all kinds of problems well will choose more challenging goals in life and are more persistent.²⁶ These theories show that self-recognised and confident people are more inclined to make choices motivated by interest.²⁷

In China, medical schools require higher entrance scores than other majors, and these high scores may be linked with higher self-efficacy because of the demonstrated positive correlation between academic performance and self-efficacy,²⁸ which may then prompt them to value their own interests.

In addition to *interest in the health sciences*, a relatively higher number of students selected *income and social status* and *advocating altruism* as career choice motivations. This was consistent with the trends shown by a Hungarian study,²⁹ where although altruism was important, it was not the only consideration for students, and career and status plans also accounted for a large proportion of the motivation. Advances in science and technology brought not only material changes but also the desire to improve quality of life and standards of living.³⁰ A summary of career choice motivations pointed out that in some middle-income countries, students would yearn for a better lifestyle and higher income when basic needs have already been met and would be attracted by the sense of security and social respect brought by a career as a doctor.⁶ As such, perhaps what used to be a traditional aspect of medicine (altruism)³¹ now invites major focus in remediation in medical education and medical school admissions.

The most mentioned subdimensions of professionalism were *accountability*, *pursuit of excellence* and *compassion*. A previous study on medical students' perceptions of medical professionalism provided evidence that students' general knowledge of professionalism mainly comprised responsibility and compassion, demonstrating that students can recognise fundamental core values of medical professionalism even at the earliest level of their medical education.³² This may be because *responsibility* and *compassion* are common aspects of *humanism*,⁹ which is generally recognised and expected by the society for medical careers.³³

The pursuit of excellence was defined as 'pursuit of progress, updating knowledge, breaking through difficulties, and lifelong learning awareness' in this framework.¹⁹ In recent years, students' self-concept and self-directed learning have seen significant improvement, which has been confirmed in international studies on first-year students' understanding of professionalism and professionalism identity formation.^{32–34} Self-concept is defined as the way an individual perceives himself and his potential to evaluate his strengths and weaknesses.³⁵ Self-directed learning refers to the process in which students actively diagnose their learning needs, create learning goals, determine learning resources, apply appropriate learning strategies and evaluate their learning outcomes.³⁶ Based on the above concepts and their relation to self-awareness, students may be driven to have a more proactive attitude towards what is to be accomplished. Therefore, we can infer that the high rate of mentioning *pursuit of excellence* may be driven in part by students' self-awareness. For these most-mentioned professionalism dimensions, more encouragement should be given in future medical

education to avoid lapses in professionalism that may occur with the accumulation of medical knowledge and the progress of medical practice.³⁷

Other dimensions of professionalism, including *integrity*, *respectfulness*, *collaboration* and *fair and ethical stewardship of healthcare resources*, were mentioned relatively less. These professionalism dimensions that were less recognised by first-year medical students may need to be nurtured through professionalism education. According to students' individual understandings of professionalism, personalised learning may be introduced to meet the differing needs of students.³⁸ Medical educators may consider using career choice motivation as an entry point to develop professionalism education programmes.

Students who were motivated by *interest in the health sciences* mentioned *compassion* more than others. An overview of self-compassion showed that there is a close relationship between compassion and self-compassion.³⁹ Another study of nurses showed that understanding of self-compassion may be a source to compassionate care.⁴⁰ Research has shown that self-compassion may be positively related to intrinsic motivation, which suggests that motivation originates from genuine interest.⁴¹ Research suggests that self-compassionate individuals tend to experience a greater sense of autonomy and self-determination in their lives.⁴¹ According to self-determination theory, students who were motivated by *interest in the health sciences* were those who chose careers according to their interests; they were more self-determined.²⁰ Based on this concept, students who were motivated by *interest in the health sciences* may have had higher levels of self-compassion. Linking theory with evidence from this study, the correlation between students who had *interest in the health sciences* and students mentioning *compassion* may be attributed in part to the role of 'self-compassion', which calls for further research in this area.

Students whose medical motivation was *parents' expectations or illness in the family* demonstrated a higher level of awareness of *collaboration*. Collaboration was defined in this framework as good cooperation with the medical team and with patients, to communicate to resolve conflicts and complete medical tasks.¹⁹ Intimate relationships with family members and family support may lay some foundation for a teamwork atmosphere. A study promoting therapeutic alliance between families of patients and research teams showed that collaboration developed through communication between patients and their families, between families and physicians, and among medical teams.⁴² It may be possible that students who were motivated by *illness in the family* (*desire to care for a family member*) recognised the importance of collaborative teams in the process of caring for their families and therefore paid more attention to *collaboration*. For example, in student responses, students mentioned things such as 'a good doctor should keep a good interpersonal relationship with team members and give them emotional support' and 'before medical decision making, physicians should be good at listening to patients'.

In Maslow's hierarchy of needs,⁴³ 'medical resources' may be classified as a basic need. *Income and social status* belongs to the fourth level: 'the need of respect, prestige, prominence, magnificence, appreciation, attention, status, self-esteem', and *advocating altruism* belongs to the top level of 'need for self-realisation'.⁶ In this study, students who were motivated by *income and social status* and who were motivated by *advocating altruism* demonstrated a lower recognition of *fair and ethical management and use of medical resources*. Maslow's hierarchy of needs can be used to provide the possible explanation that when high-level needs arise, low-level needs are no longer the dominant needs.⁴³ Interestingly, in this study, students who seemingly had contrasting motivations (income and status vs altruism) both tended to mention 'medical health resources' less than others. This suggests that no matter whether or not the value pursuit of students reaches the level of 'self-actualisation', there may be no clear consciousness and opinion on the allocation and use of basic resources. However, the rational allocation and use of resources is crucial in both the healthcare system and the society. Therefore, in medical education, students' management and awareness of medical and health resources should be strengthened.

There were several limitations in our study. This was a cross-sectional study, so causal relationships between first-year students' career choice motivations and their understanding of professionalism could not be inferred. We recommend further longitudinal research to follow-up and investigate the causal relationship between these two concepts. Another limitation of this study was that we were not able to collect information on the types of motivations in a ranked and sequenced way. The relative importance given to these various motivations by prospective doctors may affect their career choice in the future.⁴⁴ This is something to be improved on in future investigations. On the basis of this study, future work should further explore whether students' career choice motivations would change as their medical studies progress,⁴⁵ and if so, to what extent such changes will affect students' perceptions of medical professionalism.

CONCLUSION

This study provided evidence that first-year medical students with different motivations to study medicine had different understandings of professionalism. Career choice motivations of medical students could be used as a potential entry point for professionalism education, and interventions and remediation can be adapted to improve medical students' professionalism by customising them based on students' career choice motivations.

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