

FACTORS INFLUENCING MEDICAL STUDENTS' FUTURE CAREER CHOICE IN FAMILY MEDICINE – A LITERATURE REVIEW

Dr Wong Teck Yee

ABSTRACT

Medical students choose their future careers based on many factors, of which many have been proposed. There are no clear reasons why medical students choose one specialty over others. This literature review serves as a starting point for a proposed study on Singaporean medical students' attitudes towards FM as a career choice. The search covered period from 1993 - 2012 using Medline database and the keywords: medical students, career choice, Family Medicine or general practitioner/general practice. Twenty articles (out of 274) met the review criteria. Three themes emerged - career choice specific to FM and in general and on attitudes towards FM. Positive factors included: female gender, older age, perceived lifestyle, rural background, a patient/societal orientation and experience with role-models. Negative factors included: research interest, nature of work, low income/prestige and debt repayment. Proportion of students interested in FM as a career was below 30% in most studies. The review showed that factors affecting career choices are complex. Difference in healthcare systems were also important factors. It is uncertain if studies conducted in different countries are reproducible. This review identified possible factors affecting medical students' interest in a FM career and their attitudes towards FM as a profession.

Keywords: Career choice, Family Medicine, General practice, Medical students

SFP2014; 40(4): 76-84

INTRODUCTION

There are no clear reasons why medical students choose one specialty over others. Factors like demographics, personality, experiences at medical school and curriculum content¹ have been mentioned as potential determinants of specialty choice. Like many other countries^{2,3,4}, there appears to be a lack of interest anecdotally among undergraduate medical students in a career in Family Medicine (FM) or primary-care in Singapore.

With a new residency program in FM that started in 2011, we postulated that a revamped, structured FM vocational training program will evoke interest among medical students to

consider a career in FM. We set out to conduct a study to assess the attitudes of medical students from Yong Loo Lin School of Medicine (YLLSoM), which was the only undergraduate-entry medical school in Singapore at that point in time (2012), towards FM and possible factors affecting their future career choices. Such a study would serve to inform policy-makers and residency program planners how medical students view primary-care as a career and the possible reasons affecting decisions of future career choices. This would also allow us to advise how medical school curricula can be enhanced to highlight the importance of primary-care and increase interest among medical students.

Goal of review

This literature review, which was conducted prior to planning the study mentioned above, focuses on articles that attempt to assess the attitudes of medical students in different countries towards FM as a career choice and their attitudes towards Family Physicians.

METHODOLOGY

Relevant articles related to the research questions were identified by searching the Medline database. Two search strategies were employed, and the results were combined for this review. The initial search strategy used was to search for the following terms both singly and in various combinations: "Medical students" [MeSH terms], "career choice" [MeSH terms], "Family Medicine".

After employing the initial search strategy, additional articles were also selected by reviewing the citation list and references of relevant articles located by the initial search method. Concurrently, we also employed a search of the gray literature using Google to locate reports published by Governments or Associations.

For initial inclusion criteria, we selected papers published in English between January 1992 and August 2012. We chose this period of 20 years as we believe that any changes in attitudes would be observed in such a time-frame. We screened the titles and abstracts and excluded articles not related to our research question. We excluded studies that: (1) were not conducted in countries with similar per-capita income to Singapore, (2) participants who were not medical students (eg. residents, students prior to entry to medical school) and (3) studies that did not assess either attitude towards FM / General Practice or career preferences as a whole.

A total of 214 articles were selected for initial evaluation after the initial search. Out of the 214 articles, the following

WONG TECK YEE, Consultant, Family Medicine, Tan Tock Seng Hospital, Singapore; Assoc Prof (Adj) & Asst Dean (Family Medicine), Lee Kong Chian School of Medicine, Nanyang Technological University, Singapore

were further excluded for the following reasons: publications prior to 1992 and after August 2012 (50), not related to FM / GP but to other specialties (43), related to academia / curriculum (31), related to admission processes to medical school (7), commentary article (1), residency programs (3) and issues related to rural medicine/ rural background (6), leaving 73 articles.

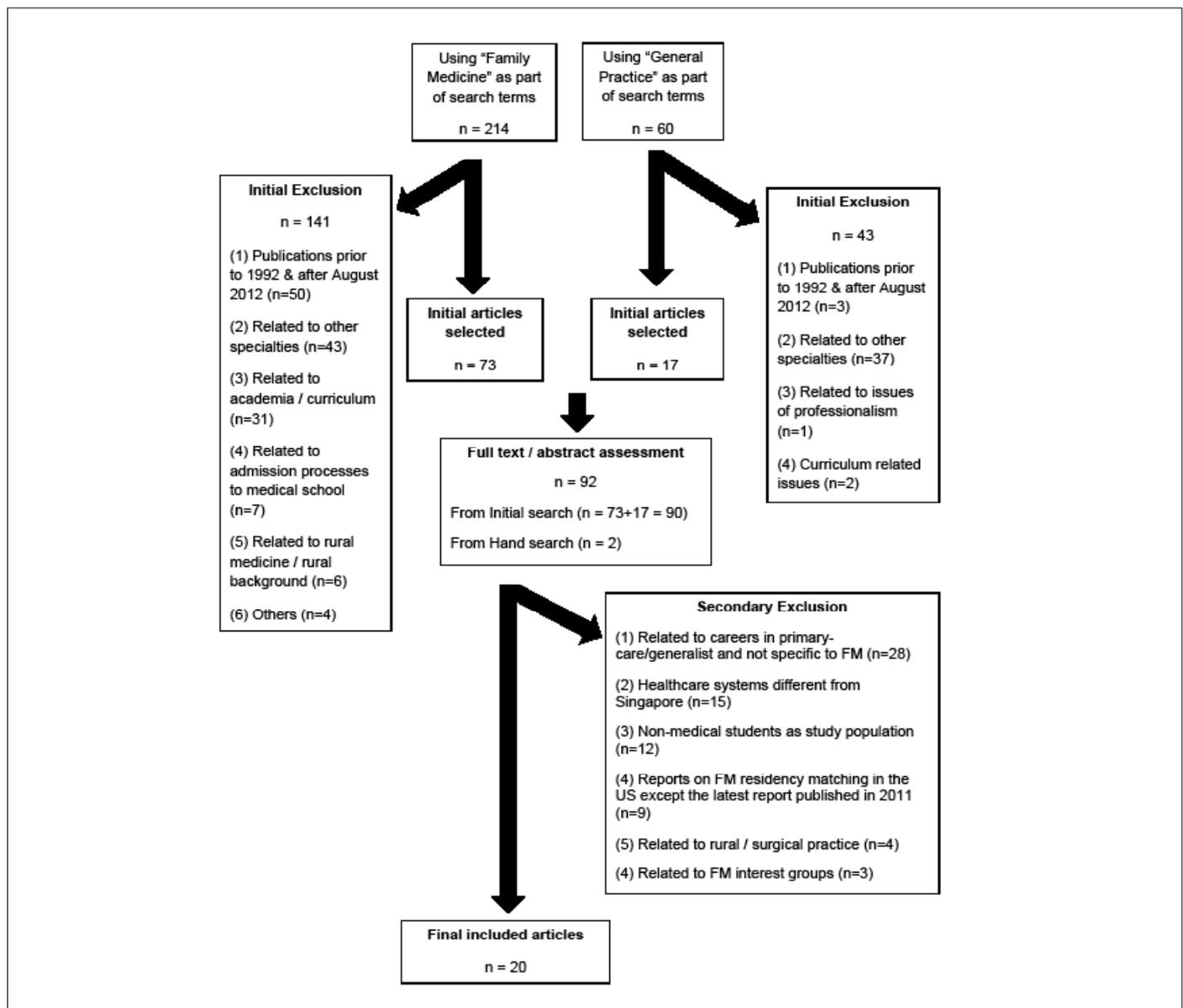
We did a further search using other terms in place of “Family Medicine”, “General Practice”, “General Practitioners” as these terms are commonly used in publications in the U.K and Commonwealth countries like Australia. This led to a further 60 articles. Articles were further excluded due to: (1) publication prior to 1992 and after August 2012 (n=3), (2) not related to FM / GP but to other specialties (n=37) and (3) related to issues of professionalism (n=1) and (4) curriculum related issues (n=2), resulting in 17 articles.

These two searches resulted in a total of 90 (73+17) articles, of which we reviewed either the abstracts or full-text. We further identified 2 papers by reviewing the reference list of the identified articles.

Of the 92 articles, some were further excluded for the following reasons: (1) Healthcare systems that are less developed / different from Singapore (n=15), (2) Reports on FM residency matching in the US except the latest report in 2011 (n=9), (3) FM interest group (n=3), (4) non-medical students as study population (n=12), (5) Related to rural practice (n=3), (6) related to surgical practice (n=1), (7) Related to careers in primary-care/generalist and not specific to FM (n=28) and (8) Gender-related issues (n=1).

A total of 20 articles were finally selected after literature search, applying the inclusion/exclusion criteria and by hand search (Figure 1).

FIGURE 1: LITERATURE SEARCH



RESULTS

Three main themes emerged from the final result set:

- (1) Articles on career choice which are specific to Family Medicine or General Practice (n=14)
- (2) Articles on attitudes of medical students towards Family Medicine or General Practice (n=2)
- (3) Articles on career choice of medical students (n=4)

Overview of articles chosen

The majority (n=17, 85%) of the articles chosen, with the exception of 3, were research studies conducted in countries like the US, UK, Canada, New Zealand, Australia, Germany and France. One was a literature review of factors related to career choice of FM⁵ while the other was an Australian review paper⁶ adapted from a commissioned report. The last was a report⁴ on the placement of US medical graduates into FM residencies in 2011.

Of the 17 studies chosen, 8 were cross-sectional surveys and 6 were cohort studies of medical students in their different years of study. The other 3 were qualitative studies conducted in Canada – two^{7,8} looked at factors influencing students to choose careers in FM while the last⁹ looked at medical students' professional identification with FM.

Summary of key findings

Articles related to career choice specific to FM or General Practice (n=14)

The key findings on papers related to factors affecting choosing FM as a career are summarised in Table 1.

Multiple factors were identified in the 14 articles selected. Gender was common in five papers,^{6,10,11,12,13,14} identifying females as more likely to choose a career in FM. Another factor identified was the background from which student grew up in. A rural background or having lived in a smaller community^{2,5,13,14} was shown to positively predict choice of FM. The ages^{2,14,15} of the students also appeared to be a predictor, especially with older students being more likely to choose a career in FM. The perceived lifestyle^{8,10,12} of working in FM and the varied nature of FM work^{2,7,8,12,13,15} were also identified as significant factors. Students who reported having a more patient or societal orientation^{2,12,17} were also more likely to select FM.

Another aspect was the influence of medical school experience on career choice. Experience with mentors or role-models^{5,6,7} and exposure to community-based practice^{8,10,11,12} were also factors reported as positively associated with choice of a career in FM. However, one study¹⁶ did not find any relationship between having an assigned generalist preceptor during clerkship and students' future career choice. In the review paper⁶ from Australia, the effects of curriculum on a definite career choice appeared different for different countries – only a minority of Australian and UK students have a definite career choice after graduation compared to US and Canadian students.

For the proportion of students interested in FM as a career, figures reported in the literature reviewed were mostly below 30%^{2,12,13,14}. The latest report⁴ on US medical seniors was even more marked, with only 8.4% matched for a FM residency program in 2011. As for the longitudinal studies reviewed, one¹⁰ showed that there was an increase in male students' interest after a posting in General Practice but it fell after their housemanship (internship) year. Another¹³ actually showed a decrease from 40% (at entry) to 29% (at exit). However, one¹² conducted in Scotland actually showed an increase from 12.6% to 28.6%.

Some of the papers also looked at negative factors towards a career in FM. Interest in research^{5,14,15} and the nature of FM work (eg. breadth of knowledge needed, limitations in managing patients, routine nature etc)^{5,10,12} were found to be negative factors. Other factors identified in the review paper⁵ showed that low income and prestige were also important negative factors. This was described in 2 papers – one¹² had respondents reporting that choosing FM would be a 'waste' while the other¹⁴ found that students chose shorter residency program (ie. FM) so as to pay off their medical school debt earlier.

Articles on attitudes of medical students towards Family Medicine or General Practice (n=2)

The key findings of articles related to the attitudes of medical students towards Family Medicine or General Practice are summarised in Table 2.

The first paper¹, conducted in the UK, related to how students view General Practitioners and showed that medical students had a positive attitude towards General Practitioners and attributed this to their experience in Medical School. The second paper¹⁸ dealt with students attitudes towards FM as a discipline but reported that the respondents were able to identify the 'nature of practice' for FM but held negative attitudes towards skills / knowledge required for the practice and the status of FM in terms of prestige and remuneration.

Articles on career choices of medical students (n=4)

The key findings of papers related to the career choices of medical students in general are summarised in Table 3.

Investigators in a study described in one of the papers¹⁹ asked students to rank different medical specialties by prestige and lifestyle. General Practice was ranked as a low prestige but with a high 'lifestyle' component. The other 3 papers^{20,21,22} report studies that looked at various factors that could affect future career choices of medical students. In two papers^{20,21}, both conducted in Canada, 'lifestyle' was the main factor cited for choosing FM while one²¹ concluded that remuneration was an important factor against choosing FM. The last paper²², conducted in France, showed that women preferred General Practice and that the opportunity for private practice, rather than lifestyle or remuneration, was a motivating factor for choosing General Practice.

TABLE I: KEY FINDINGS ON PAPERS RELATED TO FACTORS AFFECTING CHOOSING FM AS A CAREER

Study	1996 Morrison & Murray ¹⁰ Br J Gen Prac "Career preferences of medical students: influence of a new four-week attachment in general practice"	2001 Howe A, Ives G ¹¹ Med Educ "Does community based experience alter career preference? New evidence from a prospective longitudinal cohort study of undergraduate medical students"	2002 Gazewood JD, Owen J, Rollins LK ¹⁶ Fam Med "Effect of generalist preceptor specialty in a third-year clerkship on career choice"	2003 Jordan J, Brown JB, Russell G ⁷ Can Fam Physician "Choosing family medicine. What influences medical students?"	2003 Senf JH, Campos-Outcalt D, Kutob R ⁵ J Am Board Fam Pract "Factors related to the choice of family medicine: a reassessment and literature review"
Country	UK (Scotland)	UK (Sheffield)	US	Canada	N.A
Study Design	Cohort	Cohort	Cohort (retrospective)	Qualitative	Review
Study Group, Response Rate	Final Year medical students/ house officers, University of Glasgow 131/206 (63.4%)	3rd & 4th year medical students at 1 medical school, 504/692 (72.3%)	3rd Year medical students 464/489 (94.8%)	Medical students at 1 medical school, matched to FM residency programs, 11/29	36 articles on FM choice (published since 1993)
Assessment Tool	Questionnaire survey (3 time-points)	Cohort	Questionnaire survey	11 Semi-structured interviews	N.A
Findings	(1) Prior to GP posting, females were more likely to choose GP as a 1st career choice (2) There was an increase in males showing interest in a GP career but this fell after their housemanship year. (3) Reasons for positive preference: - Disillusionment with hospital medicine - Perceived GP lifestyle 4) Reasons for negative preference: - positive feelings about hospital medicine - limitations of managing patients	(1) Respondents expressed preference for a community based career after community placement. (2) Females more likely compared to males	(1) Did not find any relationship between assigned preceptor during clerkship and future career choice	(1) FM mentors were important influence (2) Liked the wide scope	Factors influencing choice of FM: - rural background - believe importance of primary-care - low income expectations - not interested in research - exposure to FM in clinical years - Role models (can be both positive or negative) - Planning to work in rural / disadvantaged areas Respondents against FM: - ↓ prestige - ↓ low income - ↑ breadth of knowledge required
Study	2004 Wright B, Scott I, Woloschuk W, Brenneis F, Bradley J ² CMAJ "Career choice of new medical students at three Canadian universities: family medicine versus specialty medicine"	2006 Sinclair HK, Ritchie LD, Lee AJ ¹² Eur J Gen Pract. "A future career in general practice? A longitudinal study of medical students and pre-registration house officers"	2007 Scott I, Wright B, Brenneis F, Brett-Maclean P, McCaffrey L ⁸ Can Fam Physician "Why would I choose a career in family medicine?: Reflections of medical students at 3 universities"	2009 Bunker J, Shadbolt N ⁶ Aust Fam Physician "Choosing general practice as a career - the influences of education and training."	2010 Poole P, Bourke D, Shulruf B ¹³ N Z Med J "Increasing medical student interest in general practice in New Zealand: where to from here?"
Country	Canada	UK (Scotland)	Canada	Australia	New Zealand
Study Design	Cross-sectional	Longitudinal cohort study	Mixed methods (qualitative & quantitative)	Review*	Cohort Study
Study Group, Response Rate	Medical students at 3 medical schools, 519/583 (89%)	Medical students from 1 medical school, Yr 1 (100%) to pre-registration house officer (PRHO) (59.5%)	Medical students from 3 medical schools	N.A	Medical students from 1 medical school, Response rate: 80%
Assessment Tool	Questionnaire Survey	Questionnaire Survey	Focus groups, interviews & surveys	N.A	Questionnaire Survey

Findings	<p>(1) 20% chose FM as 1st-choice</p> <p>(2) Characteristics of students choosing FM: - older - concerned about lifestyle - lived in smaller communities - demonstrate societal orientation - desire varied scope of practice</p>	<p>(1) 1st choice General Practice: Yr 1 (12.6%) to PRHO (28.6%)</p> <p>Characteristics of respondents choosing GP: - Female - family home in Scotland - Decided on their future career earlier</p> <p>Factors favouring GP: - working as part of a community - getting to know patients - continuity of care - variety of illnesses - experiences during medical school - dislike of hospital medicine - lifestyle (esp part-time work)</p> <p>Factors against: - dull / routine - lacked variety - 'waste' medical degree</p>	<p>Factors affecting choice:</p> <p>(1) Clinical exposure (2) Postgraduate training (3) Nature of future practice (4) Non-practice life considerations</p>	<p>Influences on choice of General Practice as a career:</p> <p>(1) Medical student selection - ↑ Females - Graduate entry</p> <p>(2) Curriculum - mixed conclusions - differences betw Aust/UK & Canada/US medical students</p> <p>(3) Prevocational experience - positive & negative role models important</p> <p>(4) Vocational training</p> <p>Positive factors: - ease of entry - duration of training</p>	<p>(1) 40% (entry) vs 29% (exit) showed interest in General Practice</p> <p>(2) 25% showed no interest at both time-points</p> <p>(3) High levels of interest were seen in: - Females - Students born in NZ - Rural origin - Career flexibility</p>
----------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

* This article is from a report commissioned by General Practice Education and Training Australia title "If the job fits ... the complexity of medical career decision making: a review". The full report is available at: www.agbt.com.au/PoliciesPublications/Research/.

Study	2011 Biggs WS, Bieck AD, Pugno PA, Crosley PW ⁴	2011 Vanasse A, Orzanco MG, Courteau J, Scott S. ¹⁴	2011 Kiolbassa K, Miksch A, Hermann K, Loh A, Szecsenyi J et al ¹⁷	2011 Scott I, Gowans M, Wright B, Brenneis F, Banner S et al. ¹⁵
	Fam Med	Can Fam Physician	BMC Fam Pract	CMAJ
	Results from 2011 National Resident Matching Program: family medicine"	"Attractiveness of family medicine for medical students: influence of research and debt."	"Becoming a general practitioner - which factors have most impact on career choice of medical students?"	"Determinants of choosing a career in family medicine."
Country	US	Canada	Germany	Canada
Study Design	Results from 2011 National Resident Matching Program (NRMP)	Cross-sectional	Cross-sectional	Prospective cohort study
Study Group, Response Rate	Applicants for US FM residency programs, 2011	Medical students attending Canadian Medical schools 2819/9126 (30.8%)	Medical students from 5 medical schools 1114/1299 (85.8%)	Medical students from 8 Medical schools 1542/1941 (79.4%)
Assessment Tool	Data extracted from 2011 NRMP	Questionnaire Survey	Questionnaire (online)	Questionnaire Survey
Findings	<p>(1) 2,576/2,730 1st-yr positions filled [fill rate: 94.4%; 91.4% (2010); 78.8% (2004)]</p> <p>(2) For US seniors, 8.4% matched in FM (7.9%, 2010)</p> <p>(3) The current number of FM residents trained annually in the US will not be sufficient to achieve the projected FP workforce needed for the US.</p>	<p>(1) Only ~30% chose FM as a career</p> <p>(2) Factors for choosing FM: - Female - Age (older) - In a relationship (eg married) - Canadian-born - exposure to non-urban environment</p> <p>Most important factor: Debt due to studies</p> <p>- Interest in research → specialties with high earning potential</p> <p>- Not interested in research → choose short residency (eg FM) to pay off debt earlier</p>	<p>Students choosing General Practice differ by:</p> <p>Patient-orientation</p> <p>Individual aspects - Personal ambition - Future perspective - Work-Life balance</p>	<p>Factors predicting FM as top residency choice: - Age (older) - In a relationship - Not having parents with postgraduate education - Not having family/friends as doctors - Desire for varied scope of practice - Shorter residency program - Lower interest in research</p>

TABLE 2: KEY FINDINGS OF ARTICLES RELATED TO THE ATTITUDES OF MEDICAL STUDENTS TOWARDS FAMILY MEDICINE OR GENERAL PRACTICE

Study	2002 Henderson, Berlin & Fuller ¹ Br J Gen Prac "Attitude of medical students towards general practice and general practitioners"	2012 Rodríguez, Tellier & Bélanger E ¹⁸ Educ Prim Care "Exploring professional identification and reputation of family medicine among medical students: a Canadian case study"
Country	UK (England)	Canada (part of a larger international study)
Study Design	Cross-sectional	Qualitative collective case design
Study Group, Response Rate	Final year medical students, 2 London medical schools (700/984 = 72%)	2nd (n=19) & 4th (n=17) Year medical students Response: 19/167; 17/168
Assessment Tool	Questionnaire survey	6 focus groups discussion
Findings	(1) Medical students had a positive attitude towards general practice as a specialty and towards GPs as doctors. (2) Most felt that their own personal experience with GPs as the most important factor affecting their attitudes. (3) Concluded that efforts by medical schools to ensure a community-based curriculum promoted positive attitudes to general practice.	Four main themes emerged: (1) Practice of FM - participants identified patient-centred medicine, diversity of practice & demanding administrative load (2) Knowledge and skills - FM required broad knowledge base and interpersonal skills, medical school encourages specialisation, FPs know less than specialists (3) Prestige - lack of prestige & respect, low salary (4) Attitudes towards FM as career choice - quality of life and values were positive points stated; active discouragement from tutors (both FPs & specialists)

DISCUSSION

In this literature review, we reviewed possible factors influencing what would make medical students choose FM as a career. We further identified 2 papers on attitudes of medical students towards FM and 4 where comparisons were made between FM and other specialties.

Factors related to choice of FM as a career

In the review of the fourteen papers related to factors affecting choice, a few appeared to be significant. These factors could be divided into three main themes: student characteristics, exposure to the discipline during medical school and expectations students have of their future career.

Student Characteristics

Many studies have identified the characteristics of a future FP as that of female gender, older in age and from a rural background or a small community. This can be observed in the UK, where more than 60% of trainees are females²³, presumably due to the flexible work hours. The finding that older graduates are keen on a FM career is also of interest. Many medical schools around the world (eg. Canada and the US) are graduate-entry schools and age-ranges of medical students are varied. Increasing, traditional undergraduate-entry medical schools in countries

like the UK and Australia are having dual entry programs, sometimes running concurrently in the same medical school. Australia reported a 'transient' increase in numbers of students interested in General Practice with the increase in graduate-entry medical school.²⁴ Lastly, some studies have identified the background of medical students as important in choosing a FM career. The review paper by Senf cited three studies (all conducted in the 1990's), that having a rural background was related to FM choice. Our review also had two more recent papers, conducted in Canada and New Zealand, showing similar association.

Singapore is an urbanised city-state with no true 'rural' regions. Thus, the background of our medical students may not be a significant factor. By August 2013, there will be two undergraduate entry medical schools in Singapore, admitting students directly out of High School. These two schools are expected to contribute 450 graduates annually at steady state, compared to the only graduate-entry school (Duke-NUS), with an annual intake of around 50. It is uncertain if the maturity of graduating students would be a factor locally. The proportion of female students is almost equal to males. This might be significant in future if female graduates tend to choose careers in primary-care, as our literature review has shown.

TABLE 3: KEY FINDINGS OF PAPERS RELATED TO CAREER CHOICES OF MEDICAL STUDENTS IN GENERAL

Study	2007 Scott, Gowans, Wright, Brenneis ²⁰	2009 Morra, Regehr, Ginsburg ²¹	2010 Creed, Searle & Rogers ¹⁹	2010 Lefevre, Roupret, Kerneis & Karila ²²
	Can Fam Physician "Why medical students switch careers: changing course during the preclinical years of medical school."	Fam Med "Medical students, money, and career selection: students' perception of financial factors and remuneration in family medicine."	Soc Sci Med "Medical specialty prestige and lifestyle preferences for medical students."	Med Educ. "Career choices of medical students a national survey of 1780 students."
Country	Canada	Canada	Australia	France
Study Design	Cohort	Cross-sectional	Cross-sectional	Cross-sectional
Study Group, Response Rate	Medical students from 8 medical schools, at 2 time-points (entry to medical school & 3 years later) (845/1188 = 71.7%)	Medical students from all 4 years, University of Toronto (560/781 = 72%)	Medical students from 11 medical schools (For question on prestige, n=530; for question on lifestyle friendliness, n=644)*	Medical students from 39 medical schools in France (response rate: 69%)
Assessment Tool	Questionnaire (47-item)	Questionnaire	Questionnaire Survey (web-based)	Questionnaire (electronic)
Findings	(1) ~20% changed their top career choices within the time period (2) The study identified 7 factors that could influence career change: medical lifestyle, encouragement, positive clinical exposure, discouragement exposure, economics/politics, competence/skill & ease of residency entry (3) "Medical lifestyle" was the most important factor for switch to FM. (4) Positive clinical exposure was the most important factor for switch to a specialty (non-FM)	(1) Comparing 4th year with 1st year students: (i) Proportion who would not consider FM due to low pay was higher (40% vs 15%). (ii) Were more likely to rank payment as the most important factor in career selection (15% vs 0%) (2) Majority of students agreed Family Physicians get too little payment (>85% of each class). (3) Concluded that Family Physicians make too little money could be an important factor in the lack of interest in FM	Prestige ranking Consistent with previous ratings High ranked: surgery, internal and intensive-care medicine Lowest ranked: Public Health, occupational and non-hospital specialists <i>Lifestyle ranking</i> Most friendly Dermatology, General Practice & Public Health Least Friendly Surgery, OBGYN & Intensive care	Career choice (1) Surgical / Medical specialties were most popular (47%), General Practice (20%) (2) Women were more likely to choose paediatrics, gynaecology and General Practice Factors affecting career choice (1) Motivating factors: Interesting diseases, chance for private practice & patient contact (2) Factors against: quality of life, only restricted to hospital-practice and loss of patient contact (3) Respondents choosing General Practice cited patient contact and chance for private practice as significant factors.

*Authors were unable to calculate the response rate as denominator was not ascertained.

Exposure to FM during medical school

Our review has shown that exposure to mentors or role-models can have a positive effect on choice. However, role-models can also be of a negative nature,⁵ with one study noting that even FPs were actively discouraging students from working in FM.¹⁸ As for curriculum related to exposure to FM or community-based teaching, our review again showed mixed results. Nevertheless, in the UK, medical schools are now making more time for community-based teaching²⁵ with General Practitioners teaching in areas previously taught in hospitals.²⁶ The review by Bunker⁶ highlighted an interesting aspect of a post-graduate training system affecting student choice. Due to the nature of the residency program in the US and Canada, the majority of students would have had to make

up their minds about a future career close to graduating from medical school.

Medical schools in Singapore have devoted a significant portion of the curriculum to FM and primary-care. For example, in Yong Loo Lin School of Medicine, FM is part of the 3rd-year curriculum, with same proportion of time allocated to teaching as Internal Medicine, Surgery, Paediatrics and Orthopaedics. Lee Kong Chian Medicine would have in the curriculum exposure to primary-care and other community-based health professionals in the early years and FM postings in the 4th and 5th year. A new Singaporean FM residency program²⁷ was started in 2011 and it remains uncertain if the effect of exposure in medical school and a new, structured post-graduate program would affect students' choice of career.

Expectations of future training and career

How FM work is perceived also emerged as a possible factor. For example, respondents cited being less interested in research in choosing FM or that being in FM would lead to a lack of research opportunities.^{5,14,15} A study in our review¹⁴ reported that medical school debt was an important factor – students would choose either a high-earning potential career or a shorter residency program like FM. Other factors identified were income and prestige, with FM ranked low in both aspects.^{5,12,18,21}

The French study²² showed that respondents choosing General Practice cited patient contact and a chance for private practice as significant factors, which were different from other countries. This could be due to the nature of the healthcare system in France, “dominated by solo-based, fee-for-service private practice for ambulatory care”.²⁸ This shows that the ‘external’ healthcare environment (ie. the financing and provision of healthcare) has a significant influence of medical student career choices.

FM as a discipline

In the UK, perception of General Practice as a discipline appeared generally positive from our review. However, it was reported²⁵ that a significant number of General Practitioners would be retiring in the near future, with only around 20% of doctors keen on General Practice as a first-choice career after graduation. The other study in our review revealed an important theme - the lack of prestige and remuneration - for a career in FM.

In Singapore, efforts have been made to raise the profile of FM and Family Physicians in the community. For example, a bill was passed in 2010 for the formation of a Family Physician Register, which recognises FM as a discipline with “unique body of skills and knowledge”.²⁹ Again, it remains uncertain if such measures would lead to a perception or even behavioural change among medical students.

Why is this topic of interest?

From the review of published studies, we noted that factors affecting career choices are complex and interact with each other. This was compounded by the fact that healthcare systems are different all over the world. Both provision and financing of healthcare are important determinants of the external (ie. working) environment which medical students will find themselves in after graduation. This will have significant effects on how students view their roles in their own local healthcare context and their preferred future career choices.

Besides differences in the local healthcare environment, little is known if medical students enter medical school already decided on a future career or change their minds during medical school. The study by Scott²⁰ showed only 1 in 5 changed their minds during medical school. Perhaps the effect of curriculum, role models and other factors related to medical schools may not be that significant to influence medical students compared to their own experiences prior to entry to medical school.

Lastly, it is uncertain that studies conducted in different countries applicable to Singapore. Variations could be in medical student population (eg. background, maturity and gender ratio), medical school (undergraduate vs post-graduate entry, differences in curriculum) and healthcare systems. It might not be appropriate to extrapolate findings from one country to the next.

Future Research Needs

Currently, we are not aware of any published reports or studies on the factors affecting career choice for FM among Singaporean students. This is important as factors identified in Singapore may be unique and different from other countries. New developments related to Family Medicine and primary-care in Singapore which may potentially increase interest among medical students in FM. This would allow us to inform policy-makers with regards to manpower planning and even possibly reviewing current medical school curriculum if necessary. Almost all the studies in our review showed less than 30% interested in a career FM among medical students in different developed countries. We postulate that the figure for Singaporean students will not be significantly different from this figure.

CONCLUSION

The literature review has allowed us to assess the possible factors affecting students’ interest in a FM career and their attitudes towards FM as a profession. This would enable us to design a study relevant to assess similar factors among Singaporean medical students.

Acknowledgment

The author would like to thank A/Prof Joshua Jacobs (NUHS) for assisting in the literature review and also for his helpful comments on this manuscript.

REFERENCES

1. Henderson E, Berlin A, Fuller J. Attitude of medical students towards general practice and general practitioners. *British Journal of General Practice* 2002; 52: 359-63.
2. Wright B, Scott I, Woloschuk W, Brenneis F. Career choice of new medical students at three Canadian universities: family medicine versus specialty medicine. *CMAJ* 2004; 170: 1920-4.
3. Efthimios D, Avgerinos, Pavlos Msaouel, George A. Koussidis, Nikolaos C. Keramaris, Zacharias Bessas et al. Greek medical students’ career choices indicate strong tendency towards specialization and training abroad. *Health Policy* 2006; 79: 101-6.
4. Biggs WS, Schmittling GT, Bieck AD, Crosley PW, Pugno PA. Entry of US Medical School Graduates Into Family Medicine Residencies: 2010–2011 and 3-year Summary. *Fam Med* 2011; 43: 625-30.
5. Senf JH, Campos-Outcalt D, Kutob R. Factors related to the choice of family medicine: a reassessment and literature review. *J Am Board Fam Pract* 2003; 16: 502-12.

6. Shadbolt N, Bunker J. Choosing general practice - A review of career choice determinants. *Aust Fam Physician* 2009;38:53-5.
7. Jordan J, Brown JB, Russell G. Choosing family medicine. What influences medical students? *Can Fam Physician* 2003;49:1131-7.
8. Scott I, Wright B, Brenneis F, Brett-Maclean P, McCaffrey L. Why would I choose a career in family medicine? Reflections of medical students at 3 universities. *Can Fam Physician* 2007;53:1956-7.
9. Rodríguez C, Tellier PP, Bélanger E. Exploring professional identification and reputation of family medicine among medical students: a Canadian case study. *Educ Prim Care* 2012;23:158-68.
10. Morrison, Murray. Career preferences of medical students: influence of a new four-week attachment in general practice. *Br J Gen Pract* 1996;46:721-5.
11. Howe A, Ives G. "Does community-based experience alter career preference? New evidence from a prospective longitudinal cohort study of undergraduate medical students" *Med Educ* 2001;35:391-7.
12. Sinclair HK, Ritchie LD, Lee AJ. A future career in general practice? A longitudinal study of medical students and pre-registration house officers. *Eur J Gen Pract* 2006;12:120-7.
13. Poole P, Bourke D, Shulruf B. Increasing medical student interest in general practice in New Zealand: where to from here? *N Z Med J* 2010;123:12-9.
14. Vanasse A, Orzanco MG, Courteau J, Scott S. Attractiveness of family medicine for medical students: influence of research and debt. *Can Fam Physician* 2011;57:e216-27.
15. Scott I, Gowans M, Wright B, Brenneis F, Banner S et al. Determinants of choosing a career in family medicine. *CMAJ* 2011;183:E1-8. doi: 10.1503/cmaj.091805.
16. Gazewood JD, Owen J, Rollins LK. Effect of generalist preceptor specialty in a third-year clerkship on career choice. *Fam Med* 2002;34:673-7.
17. Kiolbassa K, Miksch A, Hermann K, Loh A, Szecsenyi J et al. Becoming a general practitioner - which factors have most impact on career choice of medical students? *BMC Fam Pract* 2011;12:25. doi: 10.1186/1471-2296-12-25.
18. Rodríguez, Tellier & Bélanger E. Exploring professional identification and reputation of family medicine among medical students: a Canadian case study. *Educ Prim Care* 2012;23:158-68.
19. Creed PA, Searle J, Rogers ME. Medical specialty prestige and lifestyle preferences for medical students. *Soc Sci Med* 2010;71:1084-8. doi:10.1016/j.socscimed.2010.06.027.
20. Scott I, Gowans MC, Wright B, Brenneis F. Why medical students switch careers: changing course during the preclinical years of medical school. *Can Fam Physician* 2007;53:95e.1-5,94.
21. Morra DJ, Regehr G, Ginsburg S. Medical students, money, and career selection: students' perception of financial factors and remuneration in family medicine. *Fam Med*. 2009;41:105-10.
22. Lefevre JH, Roupert M, Kerneis S, Karila L. Career choices of medical students: a national survey of 1780 students. *Med Educ* 2010;44:603-12. doi: 10.1111/j.1365-2923.2010.03707.x.
23. Royal College of Physicians. Women and medicine: the future. London: Royal College of Physicians, 2009.
24. Lambert TW, Goldacre MJ, Davidson JM, Parkhouse J. Graduate status and age at entry to medical school as predictors of doctors' choice of long-term career. *Med Educ* 2001;35:450-4.
25. Rosenthal J, Chana N. Future-proofing primary health care: GP recruitment and retention in the new NHS. *Br J Gen Pract*. 2011;61:430-1. doi: 10.3399/bjgp11X582985.
26. Peters M, Jones R. General Practice: the future teaching environment. Undergraduate primary care education in London: a report from the Heads of Departments of General Practice and Primary Care. London: King's College London, 2008. <http://www.kcl.ac.uk/content/1/c6/04/49/17/HoDsreport.pdf>.
27. Wong TY, Chong PN, Chng SK, Tay EG. Postgraduate Family Medicine Training in Singapore - A New Way Forward. *Ann Acad Med Singapore* 2012;41:221-6.
28. Rodwin VG. The Health Care System Under French National Health Insurance: Lessons for Health Reform in the United States. *Am J Public Health* 2003;93:31-7.
29. Lee KH. An inclusive Family Physician Register. *The College Mirror* 2010;36:15. Available: <http://www.cfps.org.sg/collegemirror/36/363/invited1.pdf>.