

Factors Influencing Medical Student's Choices of Future Specialization in Medical Sciences: A Cross Sectional Study

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Abstract

Medical specialization refers to further medical education pursued by doctors in a specific specialty by completing several years of residency and the choice of medical specialty is influenced by various factors. The aim of this study is to develop a better understanding on determinants influencing this choice among medical students. An analytical cross-sectional study on factors affecting choices of medical specialization among private medical schools in Malaysia was conducted from October till November 2016. Using prevalence of 47%, confidence level of 95% and margin of error of 6.5%, minimum sample size of 226 was acquired, with actual participation of 260 students. A validated set of questionnaire was distributed and data was analysed using Epi-Info7. The medical specialities were categorised into three groups, namely, primary care (internal medicine, paediatrics), surgery (general surgery, orthopaedics, obstetrics and gynaecology) and controllable lifestyle specialities (anaesthesiology, emergency medicine, psychiatry, ophthalmology and radiology). Out of 230 students who participated, 98 (42.6%) chose primary care, 82 (35.7%) chose surgery and 50 (21.7%) chose lifestyle speciality. Students who prefer intellectual challenges and adequate opportunity to interact with patients are more likely to choose primary care (p value < 0.05). Status and reputation is a major factor to choose surgery specialty (p value < 0.05). Less stressful working life and favorable working hours influence students to choose lifestyle specialty (p value < 0.05). Understanding of factors influencing medical students' choices in medical specialization could be used to modify methods of selection, medical school curricula and practice opportunities to better match population needs and student desires.

Keywords

Future Specialisation, Primary Care, Surgery, Controllable Lifestyle Specialities, Private Medical Students, Malaysia

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1. Introduction

Medical specialization is defined as professional attention limited to a particular specialty or sub-fields within the broad field of medicine that doctors can focus on to become skilled in and certified in. During medical school, medical students experience

similar curriculum of basic clinical science and practical skills. After completing medical school, doctors usually further their medical education in a specific specialty by completing a multiple year residency of advanced education and further training to become a medical specialist. [1]

By the end of 2016, there were approximately 50,087 doctors in Malaysia, that gives a doctor to population ratio of about

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1:632. [2] However, there are only 7000 specialists across Malaysia. [3] Majority of the Malaysia hospitals face a shortage of the number of specialists trained in the field as some specialties require substantial amount of resources to be set up and require sophisticated machines and equipment which will be very expensive to procure and maintain. Under 11th Malaysia Plan, there is strategic planning to improve the healthcare service delivery with a goal to expand the number of specialties and subspecialties trained in field while expanding accessibility to the public. [4] With the blooming medical schools in Malaysia (32 medical schools in the country) and high acceptance for overseas Malaysian medical graduates, there is an estimation of 60,000 doctors joining the Malaysian health-care system by 2018. [5]

Many factors influence the career specialty decisions made by medical students. [6-9] These factors embrace a wide spectrum of influences and range from individual characteristics, such as personality, to professional factors, including anticipation of specialty-related income. [10] It is generally believed that understanding of the factors influencing career choice could be used to modify methods of selection, medical school curricula and practice opportunities to better match population needs and student desires. [11]

To date, most studies have been performed using the other medical student population worldwide. However, data from Malaysian medical schools is relatively lacking. The aim of the study is to develop a better conceptual framework that might help to develop our understanding of career choice by investigating the preferred specialties and the determinants influencing this choice in medical students of private medical college in Malaysia.

2. Methodology

An analytical cross-sectional study on factors affecting choices of medical specialization among medical students in private medical college was conducted from October 2016 to November 2016.

Using a prevalence of 47%, confidence level of 95% and a margin of error of 6.5%, we acquired a minimum sample size of 226 by using this formula:-

$$n = \frac{Z\alpha^2 p (1 - p)}{d^2}$$

Where,

p = prevalence rate, 47%

$Z\alpha^2$ = 95% confidence level $(1.96)^2$

d = margin of error of 6.5%

Then, we confirmed the sample size calculation by using EpiStatcalc. [12] 300 students were given the questionnaire. 260 out of 300 of them answered and returned their questionnaires respectively.

The inclusion criteria included those who had given consent voluntarily, plan to pursue further specialty in future as well as has undergone clinical rotation. We excluded the students who did not respond appropriately to the questionnaires. For example, those who did not follow the instructions as well as students who answered in completely.

Purposive sampling was applied in selecting the participants in our study. We had distributed a validated set of questionnaire to these students. These self-administered questionnaires were filled by the students during free lecture hours which took 5-10 minutes, in lecture hall. The students were informed about the purpose and content of the study; they were assured that all the results of the study would be confidential and be applied only for study purpose and assured they were not forced to participate in the study. The questionnaire comprised of basic socio - demographic data; factors affecting choices of medical specialty which was formulated based on questionnaires of other three similar studies [13-15] and Myers-Briggs Type Indicator (MBTI), developed by Isabel Myers and her mother, Katharine Cook Briggs, first published in 1943. [16]

First section was about demographic details. The components that were included were age, gender, ethnicity, batch, roll number, current posting, birth order and marital status. Second section consisted of family details which included monthly family income, parents' professions and family members as doctors. Third section was about specialty choices which include general surgery, internal medicine, emergency medicine, paediatrics, obstetrics and gynaecology, orthopaedics, ENT, ophthalmology. Besides that, reasons for choice of specialization, subjects of interest during preclinical years and source of advice were also included in third section. Fourth section comprised of Myers-Briggs Type Indicator (MBTI) questionnaire, consisting of twenty items. There are 4 dimensions in MBTI which include extraversion/ introversion, sensing/intuition, thinking/feeling and judging/perceiving. Each of the questionnaires was then inserted into the main website for MBTI scoring and the personality result was collected. [17] Hence, each student will be having one dominant type of personality in each dimension. There was no need for any manual calculation for this variable.

All of these data were entered into and analysed using Microsoft Excel 2010. Next, for further calculation and statistical analysis, the result were inserted and calculated from Epi-Info7 version 3.5.1. Here, we calculated and

analysed both descriptive and inferential statistics independently.

Descriptive statistics included mean and standard deviation for age of our sample as well as frequency and percentage for sex and ethnicity. For inferential statistics, qualitative variables were initially categorised and then Chi-Square test was used to measure the association between the factors affecting the choice of medical specialty and specialization. 0.05 was set as the level of significance and odds ratio with 95% confidence interval was described.

The outcome of the study was medical specialities, which were categorised into three groups, which are primary care, surgery and controllable lifestyle specialities. [18] Primary care included internal medicine and paediatrics. Surgery included general surgery, orthopaedics and obstetrics and gynaecology. Controllable lifestyle specialities included anaesthesiology, emergency medicine, psychiatry, ophthalmology and radiology. The factors affecting the choices of medical specialization included gender, ethnicity, monthly family income, positive role model, reasons of choice, preferred subjects in preclinical years and personality.

The study protocol was reviewed and approved by Research Ethics Committee of our college. Voluntary participation was done with a written informed consent by signing the

questionnaire. The confidentiality of the results was assured to the students.

3. Results

A total of 300 students were given the questionnaire. 260 out of 300 of them answered and returned their questionnaires respectively, which is about 86.7% of responding rate. About 30 questionnaires were excluded due to incomplete or invalid answers, the resultant valid questionnaires were 230.

Table 1. Descriptive statistics of basic variables.

Variables	Values
Age (Mean ± SD)	22.8±1.1
Sex	
Male	88 (38.4%)
Female	142 (61.7%)
Ethnicity	
Malay	101 (43.9%)
Chinese	60 (26.1%)
Indian	50 (21.7%)
Others	19 (8.3%)

Table 1 showed demographic data of our respondents. The mean age was 22.8 years old. 88 of the respondents were male and 142 of them were female. Female respondents were more than the male by 23.3%.

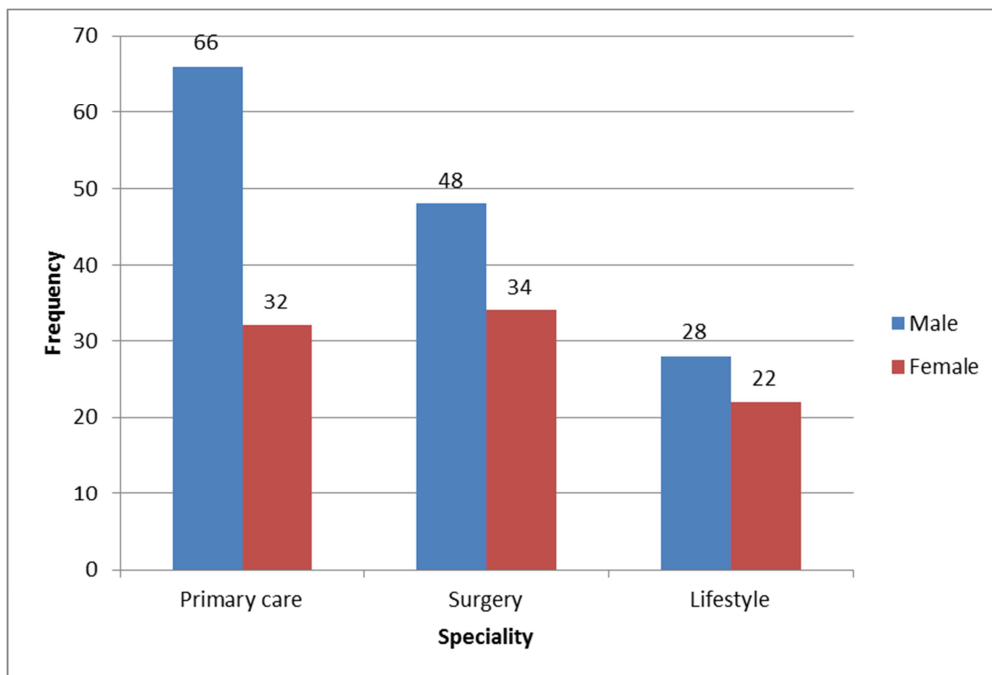


Figure 1. Number of students in different medical categories.

From figure 1, most of the students had chosen primary care as their future specialisation, while lifestyle medical speciality was the least popular among all. For all categories, female students were more compared to male students. The

most popular choice of medical specialty among female students was the primary care category, while the most popular choice of medical specialty among male students was the surgery category.

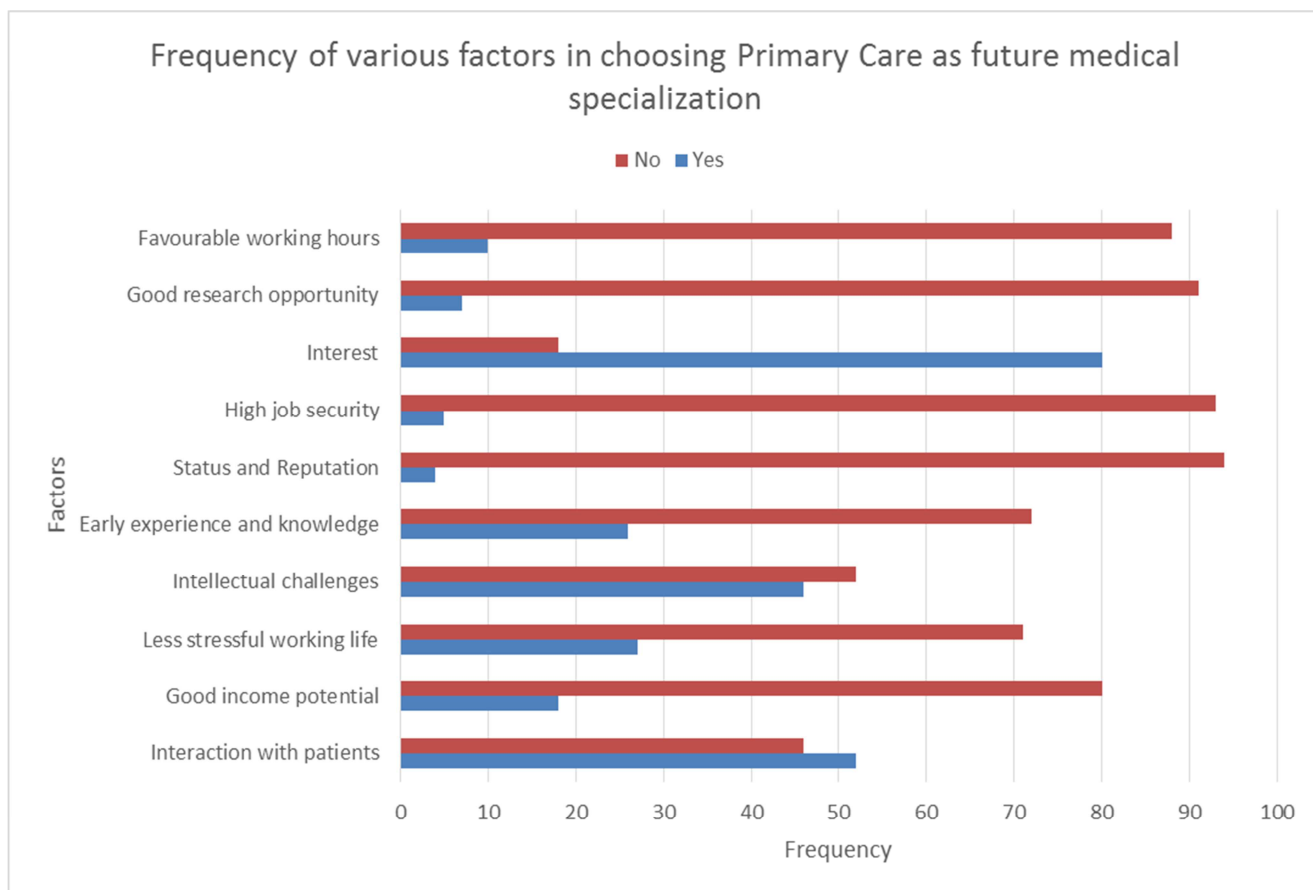


Figure 2. Frequency of various factors in choosing Primary Care as future medical specialization.

As shown in figure 2, most of the students had chosen primary care as their desired future medical specialisation due to interest and opportunity to interact with patients. The following reasons, which are: favourable working hours,

good research opportunity, high job security, high status and reputation, early experience and knowledge, intellectual challenges and less stressful working life do not affect their decision of choosing primary care as specialty.

Table 2. Comparison of Characteristics Via Quantitative Analysis Amongst Primary Care And Non-Primary Care.

Independent variables	Primary Care (n=98) No. (%)	Non-primary Care No. (%)	OR (95% CI)	Chi-square	P value
Monthly family income (RM)					
> 10 000	22 (22.5%)	36 (27.3%)	1.0		
5 000 – 10 000	41 (41.8%)	31 (23.5%)	0.5 (0.2-0.9)	4.65	0.031***
2 000 – 5 000	26 (26.5%)	47 (35.6%)	1.1 (0.5-2.3)	0.07	0.785
< 2 000	9 (9.2%)	18 (13.6%)	1.2 (0.5-3.2)	0.17	0.682
Family members working as doctor					
Yes	27 (27.6%)	25 (18.9%)	1.6 (0.9-3.0)	2.38	0.123
No	71 (72.5%)	107 (81.1%)			
Adequate opportunity to interact with patients					
Yes	52 (53.1%)	33 (25.0%)	3.4 (1.9-5.9)	19.01	1.418
No	46 (46.9%)	99 (75.0%)			
Good income potential					
Yes	18 (18.4%)	43 (32.6%)	0.5 (0.2-0.9)	5.83	0.016***
No	80 (81.6%)	89 (67.4%)			
Less stressful working life					
Yes	27 (27.6%)	49 (37.1%)	0.6 (0.4-1.1)	2.33	0.127
No	71 (72.5%)	83 (62.9%)			
Intellectual Challenges					
Yes	46 (46.9%)	45 (34.1%)	1.7 (1.0-2.9)	3.88	0.049***
No	52 (53.1%)	87 (65.9%)			

Independent variables	Primary Care	Non-primary Care	OR	Chi-square	P value
	(n=98) No. (%)	No. (%)	(95% CI)		
Early experience and knowledge					
Yes	26 (26.5%)	33 (25.0%)	1.1 (0.6-2.0)	0.07	0.793
No	72 (73.5%)	99 (75.0%)			
Status and reputation					
Yes	4 (4.1%)	19 (14.4%)	0.3 (0.1-0.8)	6.65	0.010***
No	94 (95.9%)	113 (85.6%)			
High job security					
Yes	5 (5.1%)	11 (8.3%)	0.6 (0.2-1.8)	0.91	0.341
No	93 (94.9%)	121 (91.7%)			
Interest					
Yes	80 (81.6%)	102 (77.3%)	1.3 (0.7-2.5)	0.65	0.421
No	18 (18.4%)	30 (22.7%)			
Good research opportunities					
Yes	7 (7.1%)	9 (6.8%)	1.1 (0.4-2.9)	0.01	0.924
No	91 (92.9%)	123 (93.2%)			
Favourable working hour					
Yes	10 (10.2%)	35 (26.5%)	0.3 (0.2-0.7)	9.51	0.002***
No	88 (89.8%)	97 (73.5%)			
Seek advice					
Yes	47 (48.0%)	43 (32.6%)	1.9 (1.1-3.3)	5.59	0.018***
No	51 (52.0%)	89 (67.4%)			
Personality					
Introversion/ Extroversion					
Introversion	71 (72.4%)	100 (75.8%)	0.8 (0.5-1.5)	0.32	0.570
Extroversion	27 (27.6%)	32 (24.2%)			
Sensing/ Intuition					
Sensing	70 (71.4%)	92 (69.7%)	1.1 (0.6-1.9)	0.08	0.780
Intuition	28 (28.6%)	40 (30.3%)			
Thinking/ Feeling					
Thinking	50 (51.0%)	58 (43.9%)	1.3 (0.8-2.2)	1.13	0.287
Feeling	48 (49.0%)	74 (56.1%)			
Judgement/ Perception					
Judgement	56 (57.1%)	63 (47.7%)	1.5 (0.9-2.5)	2.00	0.158
Perception	42 (42.9%)	69 (52.3%)			

***p<0.05

As shown in table 2, 98 out of total 230 students chose primary care as their future medical specialization. Students with monthly family income of RM 5 000 – 10 000 were 50% less likely to choose primary care as their future specialty compared to monthly family income RM>10,000 (p value < 0.05; Table 2).

Students who prefer adequate opportunity to interact with patients had 3.4 times more likelihood to choose primary care as their future specialty than those who don't (p value < 0.05; Table 2). Students who like intellectual challenges had 1.7 times more likelihood of choosing primary care specialty (p value < 0.05; Table 2). Students those who sought advice from others about the medical specialization were 1.9 times more likely to choose primary specialty as compared to those who didn't (p value < 0.05; Table 2).

Students who prefer good income potential were 0.5 times less likely to choose primary care as their future specialisation as compared to those who don't (p value < 0.05; Table 2). Students preferring status and reputation had 0.3 times less likely to choose primary care specialty than those who don't (p value < 0.05; Table 2). Students who opt for favourable working hours were 0.3 times less likely to choose primary care as their specialty (p value < 0.05; Table 2).

Factors such as family members working as doctor, less stressful working life, early experience and knowledge, high job security, interest, good research opportunities and personality had no influence on medical students in choosing primary care as the future specialization (p value > 0.05; Table 2).

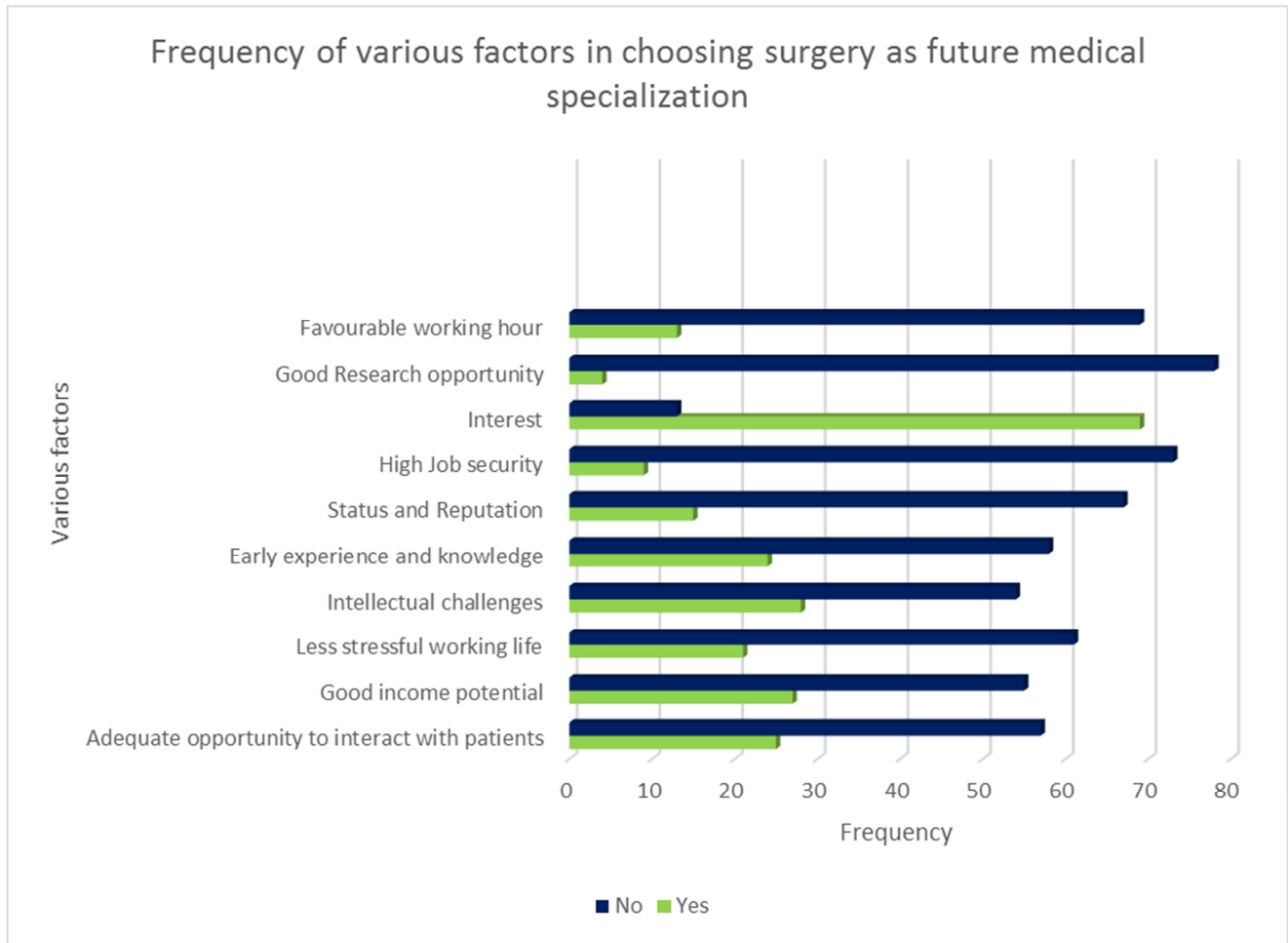


Figure 3. Frequency of various factors in choosing Surgery as future medical specialization.

From figure 3, most students who had chosen surgery as their future medical specialization was due to interest in surgery in which 69 students out of 82 had chosen surgery because of their personal interest in surgery. Intellectual challenges had

contributed the second top most common factor. Most students did not choose surgery as their desired future medical specialization due to poor research opportunity and low job security.

Table 3. Comparison of characteristics via quantitative analysis amongst Surgery and Non-Surgery specialty.

Independent Variables	Surgery (n=82)	Non-Surgery (n=148)	OR (95% C I)	Chi-square	P value
Monthly Family Income (Rm):					
>10,000	26 (31.7%)	32 (21.6%)	1.0		
5,000-10,000	16 (19.5%)	56 (37.8%)	2.8 (1.3 – 6.1)	7.51	0.006***
2,000-5,000	27 (32.9%)	46 (31.1%)	1.4 (0.7 – 2.8)	0.82	0.364
<2,000	13 (15.9%)	14 (9.5%)	0.9 (0.4 - 2.2)	0.08	0.775
Family members working as doctor:					
Yes	14 (17.1%)	38 (25.7%)	0.6 (0.3 – 1.2)	2.23	0.135
No	68 (82.9%)	110 (74.3%)			
Adequate opportunity to interact with patients:					
Yes	25 (30.5%)	60 (40.5%)	0.6 (0.3 – 1.1)	2.29	0.130
No	57 (69.5%)	88 (59.5%)			
Good income potential:					
Yes	27 (32.9%)	34 (23.0%)	1.6 (0.9 – 3.0)	2.68	0.101
No	55 (67.1%)	114 (77.0%)			
Less stressful working life:					
Yes	21 (25.6%)	55 (37.2%)	0.6 (0.3 – 1.1)	3.18	0.074
No	61 (74.4%)	93 (62.8%)			

Independent Variables	Surgery (n=82)	Non-Surgery (n=148)	OR (95% C I)	Chi-square	P value
Intellectual challenges:					
Yes	28 (34.2%)	63 (42.6%)	0.7 (0.4 – 1.2)	1.56	0.211
No	54 (65.9%)	85 (57.4%)			
Early experience and knowledge:					
Yes	24 (29.3%)	35 (22.7%)	1.3 (0.7 – 2.5)	0.87	0.350
No	58 (70.7%)	113 (76.4%)			
Status and reputation:					
Yes	15 (18.3%)	8 (5.4%)	3.9 (1.6 – 9.7)	9.74	0.002***
No	67 (81.7%)	140 (94.6%)			
High job security:					
Yes	9 (11.0%)	7 (4.7%)	2.5 (0.9 – 6.9)	3.18	0.075
No	73 (89.0%)	141 (95.3%)			
Interest:					
Yes	69 (84.2%)	113 (76.4%)	1.6 (0.8 – 3.3)	1.94	0.164
No	13 (15.9%)	35 (23.7%)			
Good research opportunities:					
Yes	4 (4.9%)	12 (8.1%)	0.6 (0.2 – 1.9)	0.85	0.356
No	78 (95.1%)	136 (91.9%)			
Favourable working hour:					
Yes	13 (15.9%)	32 (21.6%)	0.7 (0.3 – 1.4)	1.11	0.291
No	69 (84.2%)	116 (78.4%)			
Seek advice:					
Yes	26 (31.7%)	64 (43.2%)	0.6 (0.3 – 1.1)	2.95	0.086
No	56 (68.3%)	84 (56.8%)			
Personality:					
Introvert	58 (70.7%)	113 (76.4%)	0.7 (0.4 – 1.4)	0.87	0.350
Extrovert	24 (29.3%)	35 (23.7%)			
Personality:					
Sensing	60 (73.2%)	102 (68.9%)	1.3 (0.7 – 2.2)	0.46	0.499
Intuition	22 (26.8%)	46 (31.1%)			
Personality:					
Thinking	33 (40.2%)	75 (50.7%)	0.7 (0.4 – 1.1)	2.31	0.129
Feeling	49 (59.8%)	73 (49.3%)			
Personality:					
Judging	43 (52.4%)	76 (51.4%)	1.0 (0.6 – 1.8)	0.03	0.874
Perceiving	39 (47.6%)	72 (48.7%)			

***P<0.05

Table 3 shows 82 out of 230 students in MMMC chose surgery as their speciality. Besides that, students with monthly family income of RM5,000-10,000 had 2.8 times more likelihood of choosing surgery as their speciality compared to monthly family income > RM10,000. (p value < 0.05: Table 3). Students who chose status and reputation had 3.9 times more likelihood to choose surgery specialty compared to the rest. (p value<0.05: Table 3)

Figure 4 showed that most of the students who had chosen

lifestyle as their future medical specialization was due to personal interest in lifestyle specialization, less stressful working life and favourable working hour. Interest had contributed as the top most factor in their decision making. Whilst, less stressful working life had contributed the second most common factor and third top factor was due to favourable working hour in which 22 students out of 50 had chosen. Among all these factors, high job security, status and reputation had contributed the least.

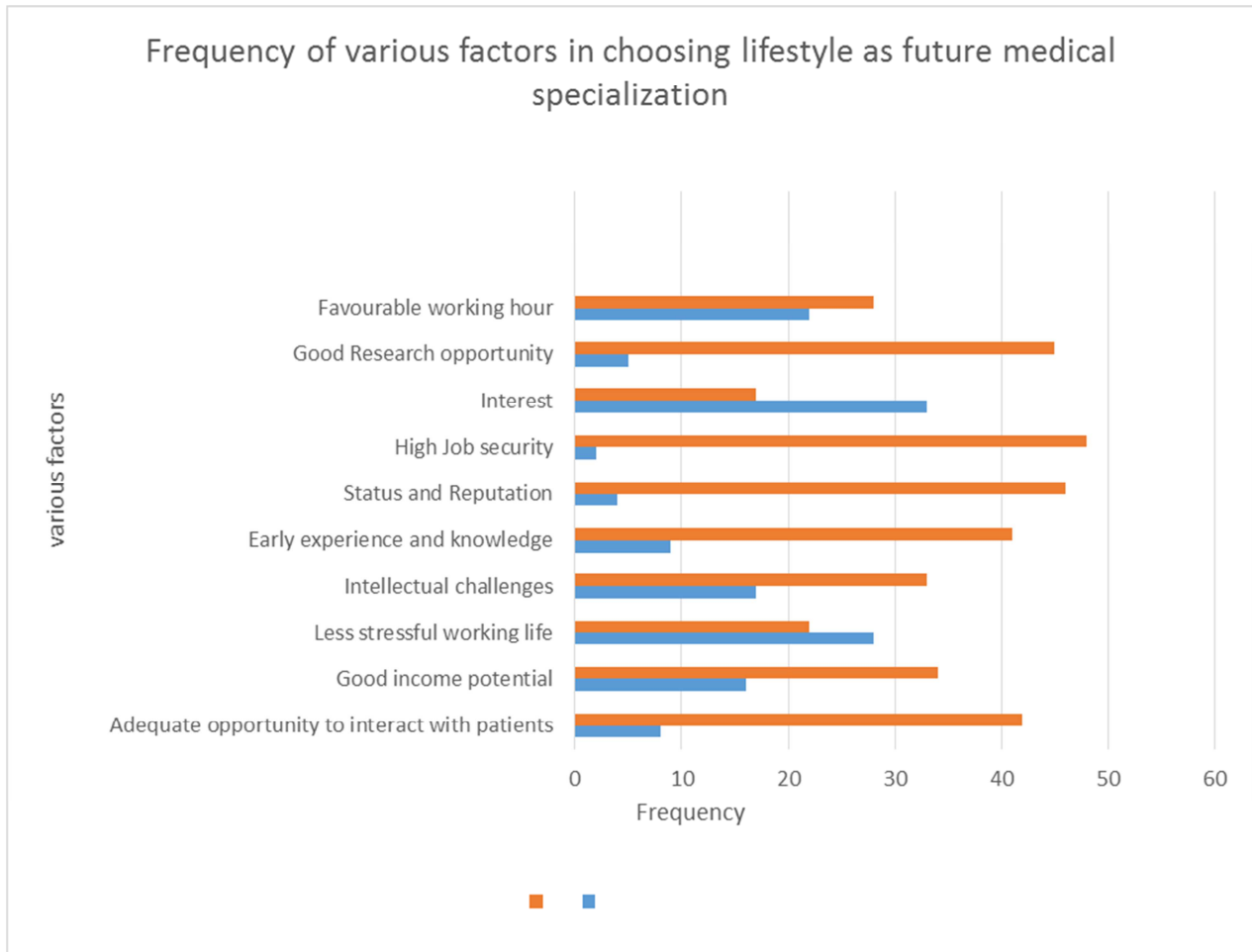


Figure 4. Frequency of various factors in choosing lifestyle specialization.

Table 4. Comparison of characteristics via quantitative analysis amongst lifestyle speciality and non-lifestyle speciality.

Independent Variable	Lifestyle Speciality (n=50) No. (%)	Non-Lifestyle Speciality (n=180) No. (%)	OR (95% CI)	Chi-Square	P-Value
Monthly family income:					
>10000	10 (10.0%)	48 (26.7%)	1.0		
5000-10000	15 (40.0%)	57 (31.7%)	0.8 (0.3-1.9)	0.27	0.605
2000-5000	20 (30.0%)	53 (29.4%)	0.6 (0.2-1.3)	1.89	0.170
<2000	5 (20.0%)	22 (12.2%)	0.9 (0.3-3.0)	0.02	0.886
Family members working as doctor:					
Yes	11 (22.0%)	41 (22.8%)	1.0 (0.5-2.2)	0.01	0.907
No	39 (78.0%)	139 (77.2%)			
Adequate opportunity to interact with patients:					
Yes	8 (16.0%)	77 (42.8%)	0.3 (0.1-0.6)	12.04	0.001***
No	42 (84.0%)	103 (57.2%)			
Good Income Potential:					
Yes	16 (32.0%)	45 (25.0%)	1.4 (0.7-2.8)	0.98	0.321
No	34 (68.0%)	135 (75.0%)			
Less stressful working life:					
Yes	28 (56.0%)	48 (26.7%)	3.5 (1.8-6.7)	15.22	P<0.001*
No	22 (44.0%)	132 (73.3%)			**
Intellectual Challenges:					
Yes	17 (34.0%)	74 (41.1%)	0.7 (0.4-1.4)	0.83	0.363
No	33 (66.0%)	106 (58.9%)			
Early Experience and Knowledge:					
Yes	9 (18.0%)	50 (27.8%)	0.6 (0.3-1.3)	1.96	0.161
No	41 (82.0%)	130 (72.2%)			
Status and Reputation:					
Yes	4 (8.0%)	19 (10.6%)	0.7 (0.2-2.3)	0.28	0.594
No	46 (92.0%)	161 (89.4%)			

Independent Variable	Lifestyle Speciality (n=50) No. (%)	Non-Lifestyle Speciality (n=180) No. (%)	OR (95% CI)	Chi-Square	P-Value
High Job Security:					
Yes	2 (4.0%)	14 (7.8%)	0.5 (0.1-2.3)	0.86	0.353
No	48 (96.0%)	166 (92.2%)			
Interest:					
Yes	33 (66.0%)	149 (82.8%)	0.4 (0.2-0.8)	6.67	0.010***
No	17 (34.0%)	31 (17.2%)			
Good Research Opportunities:					
Yes	5 (10.0%)	11 (6.1%)	1.7 (0.5-5.2)	0.91	0.339
No	45 (90.0%)	169 (93.9%)			
Favourable Working Hour:					
Yes	22 (44.0%)	23 (12.8%)	5.4 (2.6-10.9)	24.24	0.009***
No	28 (56.0%)	157 (87.2%)			
Seek Advice:					
Yes	17 (34.0%)	73 (40.6%)	0.7 (0.4-1.5)	0.71	0.401
No	33 (66.0%)	107 (59.4%)			
Personality:					
Introversion/extroversion:					
Introversion	42 (84.0%)	129 (71.7%)	2.190-9-4.7)	3.12	0.077
Extroversion	8 (16.0%)	51928.3%)			
Sensing/Intuition:					
Sensing	32 (64.0%)	130 (72.2%)	0.6 (0.4-1.3)	1.27	0.260
Intuition	18 (36.0%)	50 (27.8%)			
Thinking/Feeling:					
Thinking	25 (50.0%)	83 (46.1%)	1.2 (0.6-2.2)	0.23	0.626
Feeling	25 (50.0%)	97 (53.9%)			
Judgement/Perception:					
Judgement	20 (40.0%)	99 (55.0%)	0.5 (0.3-1.0)	3.52	0.060
Perception	30 (60.0%)	81 (45.0%)			

P<0.05***

As shown in Table 4, number of participants who chose lifestyle speciality is 50 and non-lifestyle speciality is 180. Amongst the students who participated, factors such as monthly family income, family members working as doctors, good income potential, intellectual challenges, early experience and knowledge, status and reputation, high job security, good research opportunities, favourable working hours, seek advice, and personality had no influence in choosing lifestyle as their future specialization. (p value > 0.05: Table 4)

However, students who prefer adequate opportunity to interact with patient had 0.3 times less chances in influencing

4. Discussion

The choice of medical specialty by medical students is crucial as it affects the availability of healthcare manpower and medical workforce planning. In view of this, we conducted this study to determine the factors affecting the choice of medical specialty in third and fourth year medical students. Among all of the medical specialty categories, primary care, which consists of internal medicine and paediatrics are the most preferred choice by our subjects.

Our study has shown that students who prefer adequate opportunity to interact with patients and enjoy intellectual challenges are significantly more likely to opt for primary

care as their future specialization compared to non-lifestyle. (p value < 0.05: Table 4) Besides that, those who chose less stressful working life had 3.5 times more chances in influencing them to choose lifestyle as a future specialization less compared to non-lifestyle. Furthermore, interest has 0.4 times less chances in influencing them to choose lifestyle as a future specialization less compared to non-lifestyle (p value < 0.05: Table 4) Last but not least, favourable working hours has 5.4 times more chances in influencing them to choose lifestyle as a future specialization less compared to non-lifestyle. (p value < 0.05: Table 4)

This is consistent with a few studies conducted among medical students suggesting that intellectual challenge, commitment to patient care, role models, and personal/professional satisfaction were more favourable in internal medicine compared to students choosing other specialties. [19, 20] In addition, a Brazilian study found that medical students choosing primary care specialties were characterized by high scores on social commitment and low scores on financial reason. [21]

Primary care provides comprehensive first contact and continuing care for patients with any undiagnosed sign, symptom or health concern, including health promotion, disease prevention, health maintenance, patient education and counselling. [22] It offers the appropriate platform to meet a

diversity of patients with various illnesses and establish long, rewarding personal relationships with their patients during the follow up period. This profile of factors that influence the aspiration to pursue primary care specialties is compatible with a more idealistic orientation with less importance placed on social status.

Though personal interest was the commonest reason for students to choose surgical specialty, it is not a significant factor affecting the students' choice. This outcome contradicts with the IAIM study where it was found that the factor that had the most influence on specialty selection is personal interest. [23]

Instead, our study showed that status and reputation are significant factors that motivate students to choose surgery for future specialisation. This result is supported by several other studies which established that a sense of being looked upon highly by society as surgeon encourage students to pursue further higher studies in this field. [24, 25, 26, 27] As an unwritten rule, being a surgeon is perceived to give a higher social status and respect among many other medical specialties.

Besides, there is positive correlation between high family monthly income of RM5,000-10,000 group and students choosing surgery specialty. In contrast, a study by BMC Health Services Research showed that students with large debts tend to choose surgical specialties more often and were less likely to choose primary care. [24] However, monthly income of RM5,000-10,000 is the second highest income group in MMMC, while the monthly income groups of <RM2,000 and RM2,000-5,000 did not choose surgery specialty. The explanation can be due to the high tuition fee required in order for the students to pursue in surgery specialty.

Our study shows that those who chose less stressful working life and favourable working hours has more chances in influencing them to choose lifestyle as a future specialization. Several studies have reported that a so-called controllable lifestyle has become a determinant in physicians' future specializations selection criteria. The characteristic of a controllable lifestyle is characterized by personal time free of practice and control of total weekly hours spent on professional responsibilities. It emphasizes on the amount of time remaining for activities independent of medical practice and is a reflection of both total hours worked and number of nights on call. [28] Some studies suggested that specialty-related lifestyle has become a determinant in student's criteria for selecting the field of specialty.

In a study that included medical students from nine US medical schools, showed that students prefer to select specialties that had fewer practice work hours per week,

allowed adequate time for the pursuit of recreational activities, and seemed to have a fewer call nights. [29] For female physicians the prospect of combining their professional career with family responsibilities is a key issue in the process of choosing future specialization. For instance, anaesthesiology (lifestyle speciality) is one of the female-friendly speciality offering good options for part-time work and good promotion prospects. [30] In addition to that, a study done suggested that lifestyle is a main factor in later career changes by physicians in practice. [27] This is most probably because of the changes in family life which require them to adjust their working hours in order to achieve balance in life.

The study also investigated the relationship between the personality types among medical students and their desired future medical specialization. One of the most veteran personality tests, the Myers Briggs Type Indicator (MBTI) is used to determine the personality types. This tool uses self-report to measure four independent dimensions derived from Carl Jung's Dimensions of Personality Theory: introversion – extraversion; sensing – intuition; thinking – feeling; and judging – perception. [31] Generally, it is believed that certain personality type matches the occupational requirements of a particular medical specialty. For instance, in United States, more extroverts have selected surgery as a medical specialties than introvert, and vice versa for medicine, paediatric and gynaecology specialties. [32, 33]

However, our study using the MBTI reported that there is no significant positive relationship identified in between different types of personality and future medical specialization either in primary care, surgery, or lifestyle specialties. This result is inconsistent with the majority of the studies done. It is because personality profile is not the only one variable playing a role in specialty residency choices and that these decisions may ultimately be shaped by a myriad of other factors, either in the background of the students (such as temperament and character) or the experiences or events occurring during medical school. [34] Students should not be discouraged from applying to certain medical specialty regardless of their personality trait. Moreover, the published literature is limited and the effect of personality on retention is not well established.

There is no significance found between gender and the choice of medical specialty among medical students. This implies that gender has no effect on the choice of medical specialty. This contradicts with many similar studies, which suggested gender being a factor affecting one's choice of medical specialty. [24, 25, 27, 35] Most of the studies suggested that female are more attracted to specialties with flexible and less working hours, while male students tend to choose specialties which are more physically demanding.

However, this cannot be applied in our scenario.

There may be many factors contributing to these results that we obtained. One of the reason is because the subjects are still of young age and some have yet to give much thoughts about their future. The female subjects may not have considered much about the prospects of having to look after their children which will consume a large proportion of their time. Furthermore, in this modern world, the perception that female can only do jobs that requires less physical power has changed. On the other hand, the results may be due to the uncertainty of the students and lack of understanding regarding the field they chose, this is because many of the subjects have yet to undergo a comprehensive clinical experience in all the departments. Many would prefer to undergo hospital postings in each department not just as a student in clinical years, but also more in depth when they are working as houseman before deciding on the medical specialty that they like or suits them. Some think that being exposed to the working scopes that a specific specialty have to offer during housemanship, the working environment, the hospital and the employers will also have a role in deciding the specialty.

There are a few limitations that needed to be overcome in our study. First of all, the population of the study is only based on private medical colleges. Thus, it is required for the researchers to extend the study to other local medical institutions to compare and contrast on the results obtained. As this study is cross-sectional, the findings are not to be compared on causality effect.

Future studies should involve more institutions, and more respondents ranging from the 1st year to the last year. Certain strategic interventions can enhance the attractiveness of medical specialties facing considerable manpower shortages to address the current and future healthcare needs of the nation. In our study, it is found that opportunity to interact with patients and intellectual challenges during clinical practice are the main reasons for medical students to choose primary care specialty as future specialization. Hence, the effort by medical institutions to increase early clinical exposure during undergraduate studies can increase their preference to choose primary specialty.

5. Conclusion

In this study, we have noticed that only a limited number of factors influence medical student's choices of future specialization in Medical Sciences among medical students. This study was divided into 3 broad fields: Primary care and Non-Primary care, Surgery and Non-Surgery, Lifestyle and Non-Lifestyle. It is noted that out of 230 students who participated in this study, 42.6% chose primary care, 35.7%

chose surgery and 21.7% chose lifestyle speciality. From this study, we can conclude that different factors play a role in affecting the participants choices in the field of specializations. However, there is no significant correlation between personality and its influence towards medical students that chose to specialize in Medical Sciences among MMMC students. This is because most of the medical students of MMMC have similar score for personality among all the 3 specializations which makes the result inconclusive.

It is necessary that students know their preference for future specialization before embarking in it as this will guarantee a better chance for success. Thus, it is hoped that the students can understand by getting exposed to all these fields before making a decision on their future specialization besides the factors considered in this study. In our future studies, we can try to understand what influences the specialty preference of students public institutions, across several clerkships, and over the early years of clinical practice.

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