Career Indecision Among Undergraduate Medical Students in Malaysia, a Cross-sectional Study

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Abstract

For any medical student, deciding for sure about their future career or specialty is a daunting task. Although it is accepted that one will slowly crystallise their career decision during housemanship training, having a clear career goal in medical school certainly puts one at a head start. Making early career decisions improves work readiness and confidence, aside allowing students to build their portfolio during their undergraduate training. However, decisions about future career paths do not come naturally. Many university students report a lack of career readiness and are generally indecisive about their career. With that note, our study explored the prevalence of career indecision among undergraduate medical students in Malaysia, and its associated factors. A cross sectional study was conducted among MBBS students of Manipal University College Malaysia (MUCM). Career indecision was determined using Career Factors Inventory (CFI), distributed via an online questionnaire. A total of 121 responses were collected. Data was analysed using Epi Info version 7.2 and SPSS version 12. Unpaired t test and ANOVA test were used to test the hypothesis. Our findings showed that 99.2% of students had a high level of career indecisiveness. Students younger than 22 years had significantly higher Need for Self Knowledge (NSK) scores than students above 22 years (p value= <0.001, 95% CI= 1.04 to 3.66). Preclinical students had higher Need for Self Knowledge (NSK) scores than clinical students (p value= 0.003, 95% CI= -3.46 to -0.74) Monthly household income had significant association with career indecision (p value= 0.029), where the B40 group was better decided for their future career. In short, there was a high prevalence of career indecisiveness among undergraduate medical students. Further studies have to be done to determine its causative factors. Career development programs and counselling can be included as part of the medical curriculum, in order to help students to make an informed career decision.

Keywords

1. Introduction

Career indecision refers to the difficulty in decision making for one's career. [1] The behavioural and psychological processes of career decision making involve many facets of life, and will inadvertently affect one's future. [2] According to Holland's career development theory, career indecision is considered a normal process of development that one undergoes, that will slowly fade away over time. [3] This area is important to be studied among university students, who will soon graduate and face career choice problems. Studies show that career undecided students are more likely to make poor academic and career decisions that will impact them in the long run. [4]

In the medical field, upon graduation from undergraduate studies, one begins as undifferentiated doctors, ending as

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specialised doctors in a particular field after the post graduate training. For medical students, deciding their future career or specialty is a significant stressor. [5, 6] In view of the shortage of specialists and unequal distribution of doctors, making good career decisions as medical students is important not only for personal development, but also for the general health of the society. [7]

There were a significant number of researches done to explore the choice of specialty of medical students and the factors influencing their specialty choice. [8-11] However, little recent study was done to explore the difficulty in career decision making among medical students. [12, 13] The indecision may have a negative impact in the long run, as medical students are not able to start building their professional portfolio due to the delay in decision making. [14, 15] Making good career decisions also improves work readiness, as one will have a clearer idea of their career goals. Studies also showed that university graduates lack confidence and work readiness. This problem is partly contributed by the lack of synergy between the curriculum and career preparedness, as many house officers (HO) feel the lack of clinical experience in medical school contributed to their lack of readiness, in holding their responsibility as doctors. [16] This leads to a vicious cycle as the lack of confidence may affect the doctor's mental well-being, causing them to be emotionally and physically drained. [17]

1.1. Factors Associated with Career Indecision

Career decision making in undergraduate students is a multifactorial topic. A study done on Malaysian public universities undergraduate students revealed a higher level of career indecisiveness in females, compared to male counterparts. [18] Studies also showed that self-awareness, understanding of occupations and career planning can improve one's career readiness. [19] Moreover, demographic data such as race and nationality, socioeconomic status can contribute to the extent of career maturity. [20] According to Super's Career Development theory, final year undergraduate students should be able to set clear career options. The previous years of study and experience will contribute to their internal decision making process, matching their future career with their own personal traits and interests. [21]

In the context of medical education, aside from factors above, there are other factors that contribute to one's career choice. The Malaysian medical education system requires students to rotate in a wide range of medical and surgical specialties. By the time of graduation, they would have experienced many of the areas of practice hence expected to make their career choice. Factors like clinical experience during clinical years and elective, career opportunities, work-life balance and duration of training contribute to the decision making. [8, 9] Nonetheless, there are some students who have strong preference for and against certain specialties in early years of training, showing career choice can be determined early for some. [22] Aside from the factors mentioned above, some researchers had also tried to establish a relationship between coping strategies and students' mental health with career indecision. [23]

For our study, independent variables including age, gender, ethnicity, nationality, semester of study, parents' occupation and family income are considered. We also want to see the effectiveness of career development programs in better preparing students to make career decisions. [24]

1.2. Objectives of Our Study

Our study aims to determine the prevalence of career indecision among medical students of MUCM. Secondly, we want to find the association between age, gender, nationality, ethnicity, semester of study, household income, parents' occupation and career indecision. Thirdly, we also aim to find the association between participation in career development program and career indecision.

We believe that a better understanding of the complex career indecision will provide reference for necessary intervention in undergraduate medical curriculum, in order to aid career decision making among medical students, as well as starting career pathway development in the early years of medical education. [25] The data of this study will also provide points of reflection for the current undergraduate training structure, on whether the system is adequately equipping students with career decision making capabilities, which in turn contribute to their work readiness and confidence as functioning doctors. [16]
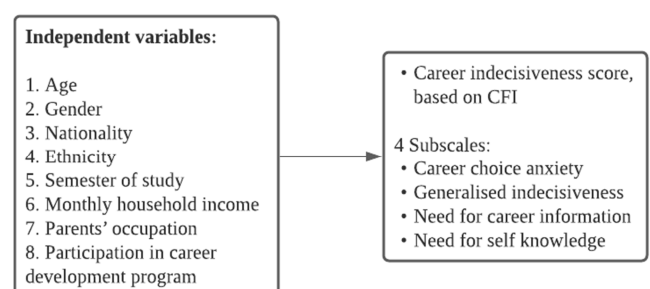

Figure 1. Conceptual framework for the association between sociodemographic variables and career indecisiveness.

1.3. Hypothesis

Null hypothesis: (H0)

(i)   There is no association between age and career indecisiveness

(ii) There is no association between gender and career

indecisiveness

(iii) There is no association between nationality and career indecisiveness

(iv) There is no association between ethnicity and career indecisiveness

(v) There is no association between semester of study and career indecisiveness

(vi) There is no association between monthly household income and career indecisiveness

(vii) There is no association between parents' occupation and career indecisiveness

(viii) There is no association between participation in career development program and career indecisiveness

Alternative hypothesis: (Ha)

(i) There is association between age and career indecisiveness

(ii) There is association between gender and career indecisiveness

(iii) There is association between nationality and career indecisiveness

(iv) There is association between ethnicity and career indecisiveness

(v) There is association between semester of study and career indecisiveness

(vi) There is association between monthly household income and career indecisiveness

(vii) There is association between parents' occupation and career indecisiveness

(viii) There is association between participation in career development program and career indecisiveness

2. Methodology

2.1. Study Design, Study Population, Time & Setting

We had conducted a cross-sectional study in Melaka University College Malaysia from June to July 2021. There are a total of 3 courses in this institution, namely, Foundation in Science (FIS), Bachelor of Dental Surgery (BDS), Bachelor of Medicine and Bachelor of Surgery (MBBS). The study that we have done only involved the students in Bachelor of Medicine and Bachelor of Surgery (MBBS). We had included both preclinical and clinical phase students.

2.2. Sample Size

The sample was calculated using Microsoft Excel sample size calculator. Our total population size is 1300. Study estimate is 51%, which is the percentage of career undecided students among Malaysian undergraduates found in previous study. [18] Acceptable margin of error is 9%. The minimum sample size was 113 students after calculation. [26]

With a non-response rate of 20%, the final sample size was calculated using the formula below. After rounding off, our final sample size was 141 students.

$$\text{n (final)} = \frac{n\ (calculated)}{1 - (non - response\ \%)} = \frac{113}{1 - 0.20} = 141.25$$

2.3. Sampling

Non-probability purposive sampling method was used for this study. The inclusion criteria were all MBBS students of Melaka University College Malaysia of at least 18 years old, still enrolling in the institution and able to give consent. The exclusion criteria were the students that did not provide written informed consent and who did not complete the questionnaire.

2.4. Data Collection Method

Due to the Movement Control Order (MCO) and the worsening Covid-19 pandemic in the country, only online learning sessions were conducted. Thus, the questionnaire was designed and distributed online via Google form to students of each semester.

The questionnaire consisted of 2 parts. The first part contained informed consent and sociodemographic details, namely age, gender, nationality, ethnicity, semester of study and monthly household income. Respondents were also asked whether their parents' are in the medical/ healthcare profession. Their participation in any career development program, for example specialisation pathways, housemanship preparatory course, USMLE/ PLAB talks was also recorded.

For nationality, we have grouped the participants into Malaysian students and international students. Different ethnicities such as Malay, Chinese, Indian and others were categorised. For the semester of study, participants were divided into pre-clinical and clinical phases. Regarding monthly household income, responses were classified into B40 group (<RM4,370), M40 group (>RM4,360-RM9,619) and T20 group (>RM9,619). [27]

For the second part, the 21-item Career Factors Inventory (CFI) questionnaire was used, which consisted of 4 subscales- Career Choice Anxiety (CCA, items 1-6), Generalised Indecisiveness (GI, items 7-11), Need for Career Information (NCI, items 12-17) and Need for Self-Knowledge (NSK, items 18-21). The questionnaire is copyrighted by J. M Chartrand, S. B. Robbins and W. H. Morrill, 1990. [28]

Responses were collected in a 5-point Likert scale. For career choice anxiety, participants were asked about their feelings when they think about their future career. A higher score reflects higher anxiety about career choice. For generalised indecisiveness, participants were asked about their perception towards their decision making in general. A higher score reflects higher indecisiveness. Regarding the need for career information, participants were asked about their perceived need for knowledge and experiences regarding various possible fields of career. The higher the score, the higher is their need for such information. About the need for self-knowledge, participants were asked about their understanding towards their personal values and identity. A higher score for this subscale indicates greater need for self-exploration.

Participants' scores for each subscale were summed up, to obtain the career indecisiveness score. Higher score on the total scale would indicate a higher level of career indecisiveness.

2.5. Data Processing and Data Analysis

Statistical analyses were carried out using Epi Info version 7.2 and SPSS version 12. We generated descriptive statistics for sociodemographic variables. For age, mean age, SD and range were calculated. Frequency and percentage were calculated based on 2 categories, below 22 years and above or equal to 22 years. For the rest of the independent variables (gender, nationality, ethnicity, semester of study, monthly household income, parents' occupation, participation in career development program), frequency and percentage for each were calculated.

For the dependent variable, the mean total score (Career indecisiveness score) and mean score for each of the 4 subscales (Career choice anxiety, generalised indecisiveness, need for career information, need for self knowledge) were calculated. The career indecisiveness score was further categorised into high career indecisiveness (score 72-105) and low career indecisiveness (27-71), based on data from previous study. [18]

We had selected unpaired t-test and ANOVA to test the association between independent variables and career indecisiveness. 95% confidence intervals (95% CI) were calculated. A p value less than 0.05 was considered statistically significant.

Table 1. Statistical tests used for hypothesis testing.

Independent variable	Dependent variable	Statistical test
Age	Career indecisiveness score	
	Career choice anxiety (CCA)	
- <22	Generalised indecisiveness (GI)	Unpaired t-test
- ≥22	Need for career information (NCI)	
	Need for self knowledge (NSK)	
Gender	Career indecisiveness score	
	Career choice anxiety (CCA)	
- Male	Generalised indecisiveness (GI)	Unpaired t-test
- Female	Need for career information (NCI)	
	Need for self knowledge (NSK)	
Nationality	Career indecisiveness score	
	Career choice anxiety (CCA)	
- Malaysian	Generalised indecisiveness (GI)	Unpaired t-test
- International student	Need for career information (NCI)	
	Need for self knowledge (NSK)	
Ethnicity	Career indecisiveness score	
- Malay	Career choice anxiety (CCA)	
- Chinese	Generalised indecisiveness (GI)	ANOVA
- Indian	Need for career information (NCI)	
- Other	Need for self knowledge (NSK)	
Semester of study	Career indecisiveness score	
	Career choice anxiety (CCA)	
- Pre-clinical	Generalised indecisiveness (GI)	Unpaired t-test
- Clinical	Need for career information (NCI)	
	Need for self knowledge (NSK)	
Monthly household income	Career indecisiveness score	
	Career choice anxiety (CCA)	
- B40	Generalised indecisiveness (GI)	ANOVA
- M40	Need for career information (NCI)	
- T40	Need for self knowledge (NSK)	
Parents' occupation	Career indecisiveness score	
	Career choice anxiety (CCA)	
- In medical/ healthcare profession	Generalised indecisiveness (GI)	Unpaired t-test
- Not in medical/ healthcare	Need for career information (NCI)	
	Need for self knowledge (NSK)	

Independent variable	Dependent variable	Statistical test
Participation in career development program - Yes - No	Career indecisiveness score Career choice anxiety (CCA) Generalised indecisiveness (GI) Need for career information (NCI) Need for self knowledge (NSK)	Unpaired t-test

2.6. Ethical Consideration

All the participants that were involved in this study were voluntary and the participants that were involved can withdraw from the study at any time without any reason. The information that we had collected would be fully kept confidential and was only used for the sole purpose of conducting this research. At the beginning of the questionnaire, the participants have to fill in the consent form. Approval for this study was obtained from the Research Ethics Committee, Faculty of Medicine, Melaka University College Malaysia.

3. Results

Table 2. Sociodemographic details of medical students of MUCM (n=121).

Variables	Frequency (%)
Age	
<22	77 (63.6)
≥22	44 (36.4)
Mean (SD)	22.0 (1.8)
Minimum - Maximum	18.0 - 27.0
Gender	
Male	65 (53.7)
Female	56 (46.2)
Nationality	
Malaysian	105 (86.8)
International student	16 (13.2)
Ethnicity	
Malay	8 (6.6)
Chinese	49 (40.5)
Indian	46 (38.0)
Others	18 (14.9)
Semester of study	
Pre-clinical phase	40 (33.1)
Clinical phase	81 (66.9)
Monthly household income	
B40 (<RM4,370)	25 (20.7)
M40 (>RM4,360-RM9,619)	56 (46.2)
T20 (>RM9,619)	40 (33.1)
Parents' occupation	
In medical/ healthcare profession	22 (18.2)
Not in medical/ healthcare profession	99 (81.8)

The age of our participants ranged from 18 to 27 years old. Among them, 77 (63.6%) of them were below 22 years, while 44 (36.4%) were 22 years and above. The mean age of our sample was 22 years. Our study consisted of 65 (53.7%) males and 56 (46.2%) females, which was a rather balanced distribution. As many as 105 (86.8%) were Malaysian students, while the rest 16 of them (13.2%) were international students. On ethnicity, only 8 (6.6%) were Malay. Chinese and Indian have similar distribution, which were 49 (40.5%) and 46 (38.0%) respectively. 18 of them (14.9%) were from other ethnicities, including international students. 40 participants (33.1%) were under preclinical phase, while the majority of them (81 students, 66.9%) were in their clinical phase of studies. Regarding the monthly household income category, 25 (20.7%) were from B40 group, 56 (46.2%) were from M40 groups while 40 (33.1%) were from T20 group. 22 (18.2%) of them had parents' in the medical or healthcare profession, while not in the case for 99 students (81.8%).

Table 3. Past experience in career development program (n=121).

Variable	Frequency (%)
Participation in career development program	
Yes	35 (28.9)
No	86 (71.1)

Regarding the participation in career development programs, 35 of the respondents (28.9%) had the relevant experience, while the majority of them (86 students, 71.1%) had not

participated in such a program.

Table 4. Career indecisiveness among medical students of MUCM (n=121).

Variable	Mean (SD)	Frequency (%)
Career Indecisiveness score		
Mean (SD)	128.7 (20.7)	
High (72-105)		120 (99.2%)
Low (27-71)		1 (0.8%)
Career Choice Anxiety (CCA)		
Mean (SD)	18.6 (4.7)	
Generalised Indecisiveness (GI)		
Mean (SD)	14.3 (4.1)	
Need for Career Information (NCI)		
Mean (SD)	23.5 (4.8)	
Need for Self Knowledge (NSK)		
Mean (SD)	15.8 (3.7)	

Career Indecisiveness score was calculated by summing up all the CFI (Career Factors Inventory) components. The score was then classified to high level career indecisiveness (score 72-105) and low level of career indecisiveness (score 27-71), according to literature [17]. The mean career indecisiveness score for MUCM medical students was 128.7. Among all respondents, 99.2% (120 students) of them had a high level of career indecisiveness, whereas only one person (0.8%) had a low level of career indecisiveness. The mean scores of each subscale were tabulated. For Career Choice Anxiety, the mean score was 18.6. For Generalised Indecisiveness, the mean score was 14.3. For the Need for Career Information, the mean score was 23.5. Lastly, for the Need for Self Knowledge, the mean score was 15.8.

Table 5. Unpaired t-test for association between age and career indecision (n=121).

Dependent Variable	Age (<22) Mean (SD)	Age (>22) Mean (SD)	Mean difference (95% CI)	P value
Career Indecisiveness score	129.1 (20.5)	128.0 (21.2)	1.09 (-6.68, 8.86)	0.782
Career Choice Anxiety (CCA)	18.2 (5.0)	19.3 (4.3)	-1.03 (-2.80, 0.75)	0.255
Generalised Indecisiveness (GI)	14.3 (4.5)	14.3 (3.4)	-0.04 (-1.58, 1.49)	0.957
Need for Career Information (NCI)	23.7 (4.9)	23.2 (4.6)	0.44 (-1.36, 2.23)	0.633
Need for Self Knowledge (NSK)	16.6 (3.1)	14.3 (4.1)	2.35 (1.04, 3.66)	<0.001

Table 5 showed unpaired t-test for association between age and career indecision. For the career indecisiveness score, the mean score of the students who were <22 year-old was 129.1 and those who were >22 year-old was 128.0. The mean difference was 1.09 and 95% confidence interval was -6.7 to 8.9, the p value is 0.782; hence it is not significant. For the CCA score, the mean score of the students who were <22 year-old was 18.2 and those who were >22 year-old was 19.3. The mean difference was -1.03 and 95% confidence interval is -2.8, 0.7, the p value is 0.255; hence it is not significant. For the GI score, the mean score of the students who were <22 years-old was 14.3 and for those who were >22 years old was 14.3. The mean difference was -0.04 and the 95% confidence interval was -1.6, 1.5, the p value is 0.957; hence it is not significant. For the NCI score, the mean score of the students who were <22 years-old was 23.7 and for those who were >22 years-old was 23.2. The mean difference was 0.44 and 95% confidence interval was 1.4, 2.2, the p value is 0.633; hence it is not significant. For the NSK score, the mean score of the students who were <22 years-old was 16.6 and for those who were >22 years-old was 14.3. The mean difference was 2.35 and 95% confidence interval was 1.04, 3.7, the p value is <0.001; hence it is significant.

Table 6. Unpaired t-test for association between gender and career indecision (n=121).

Dependent Variable	Male Mean (SD)	Female Mean (SD)	Mean difference (95% CI)	P value
Career Indecisiveness score	125.4 (22.6)	132.4 (17.7)	6.96 (-0.43, 14.36)	0.065
Career Choice Anxiety (CCA)	17.9 (4.8)	19.4 (4.7)	1.47 (-0.23, 3.17)	0.089
Generalised Indecisiveness (GI)	14.0 (4.1)	14.8 (4.1)	0.88 (-0.60, 2.35)	0.241
Need for Career Information (NCI)	23.2 (5.6)	23.8 (3.7)	0.59 (-1.14, 2.32)	0.501
Need for Self Knowledge (NSK)	15.3 (4.2)	16.4 (2.9)	1.08 (-0.23, 2.40)	0.106

Table 6 showed unpaired t-test for association between gender and career indecision. For the career indecisiveness score, the mean score of the male students was 125.4 and female students was 132.4. The mean difference was 6.96 and the 95% confidence interval was -0.4 to 14.4, the p value is 0.065; hence it is not significant. For the CCA score, the mean score of the male students was 17.9 and female students was 19.4. The mean difference was 1.47 and the 95% confidence interval

was -0.2 to 3.2, the p value is 0.089; hence it is not significant. For the GI score, the mean score of the male students was 14.0 and female students was 14.8. The mean difference was 0.88 and the 95% confidence interval was -0.6 to 2.4, the p value is 0.241; hence it is not significant. For the NCI score, the mean score of the male students was 23.2 and female students was 23.8. The mean difference was 0.59 and the 95% confidence interval was -1.1 to 2.3, the p value is 0.501; hence it is not significant. For the NSK score, the mean score of the male students was 15.3 and female students was 16.4. The mean difference was 1.08 and the 95% confidence interval was -0.2, 2.4, the p value is 0.106 hence it is not significant.

Table 7. Unpaired t-test for association between nationality and career indecision (n=121).

Dependent Variable	International students Mean (SD)	Malaysian students Mean (SD)	Mean difference (95% CI)	P value
Career Indecisiveness score	122.1 (19.6)	129.7 (20.8)	-7.54 (-18.50, 3.41)	0.176
Career Choice Anxiety (CCA)	16.7 (4.1)	18.9 (4.8)	-2.23 (-4.73, 0.27)	0.081
Generalised Indecisiveness (GI)	14.4 (4.4)	14.3 (4.1)	0.07 (-2.11, 2.25)	0.949
Need for Career Information (NCI)	21.9 (5.9)	23.8 (4.6)	-1.88 (-4.41, 0.65)	0.145
Need for Self Knowledge (NSK)	16.3 (2.6)	15.7 (3.8)	0.53 (-1.43, 2.48)	0.595

Table 7 showed unpaired t-test for association between nationality and career indecision. For the career indecisiveness score, the mean score of the international students was 122.1 and the Malaysian students was 129.7. The mean difference was -7.54 and the 95% confidence interval was -18.5 to 3.4, the p value is 0.176; hence it is not significant. For the CCA score, the mean score of the international students was 16.7 and the Malaysian students was 18.9. The mean difference was -2.23 and the 95% confidence interval was -4.7 to 0.3; the p value is 0.081 hence it is not significant. For the GI score, the mean score of the international students was 14.4 and the Malaysian students was 14.3. The mean difference 0.07 and the 95% confidence interval is -2.1 to 2.3, the p value was 0.949; hence it is not significant. For the NCI score, the mean score of the international students was 21.9 and Malaysian students was 23.8. The mean difference was -1.88 and the 95% confidence interval was -4.4 to 0.7, the p value was 0.145; hence it is not significant. For the NSK score, the mean score of the international students was 16.3 and the Malaysian students was 15.7. The mean difference was 0.53 and the 95% confidence interval was -1.4 to 2.5, the p value was 0.595; hence it is not significant.

Table 8. ANOVA for association between ethnicity and career indecision (n=121).

Dependent Variable	Malay Mean (SD)	Chinese Mean (SD)	Indian Mean (SD)	Others Mean (SD)	P value
Career Indecisiveness score	130.5 (17.0)	132.5 (19.9)	126.4 (22.6)	123.2 (18.8)	0.324
Career Choice Anxiety (CCA)	18.8 (3.7)	19.1 (4.2)	18.7 (5.6)	17.1 (4.2)	0.484
Generalised Indecisiveness (GI)	14.4 (3.5)	14.9 (4.3)	13.6 (3.9)	14.6 (4.2)	0.512
Need for Career Information (NCI)	24.8 (3.9)	24.5 (4.7)	22.9 (4.5)	21.9 (5.6)	0.152
Need for Self Knowledge (NSK)	14.8 (3.9)	15.7 (3.6)	16.0 (4.1)	16.0 (2.7)	0.808

Table 8 showed ANOVA test for association between ethnicity and career indecision. Regarding career indecisiveness score, Malay, Chinese, Indian and other ethnicities had mean scores of 130.5, 132.5, 126.4 and 123.2 respectively. The p value for career indecisiveness score is 0.324, which is not significant. For the CCA score, the mean for Malay was 18.8, Chinese 19.1, Indian 18.7 and others 17.1. The p value for the CCA score is 0.484, hence it is not significant. For the GI score, the mean for Malay was 14.4, Chinese 14.9, Indian 13.6 and others 14.6. The p value for the score GI is 0.512 which is not significant. For the NCI score, the mean for Malay was 24.8, Chinese 24.5, Indian 22.9 and others 21.9. The p value score for NCI is 0.152 which is not significant. For the NSK score, the mean for Malay was 14.8, Chinese 15.7, Indian 16.0 and others 16.0. The p value score for NSK is 0.808 which is not significant. In short, there is no association between ethnicity and career indecisiveness among medical students. The null hypothesis is accepted.

Table 9. Unpaired t-test for association between semester of study and career indecision (n=121).

Dependent Variable	Preclinical phase Mean (SD)	Clinical phase Mean (SD)	Mean difference (95% CI)	P value
Career Indecisiveness score	129.4 (23.2)	128.3 (19.4)	-1.02 (-8.97, 6.93)	0.801
Career Choice Anxiety (CCA)	17.6 (5.67)	19.1 (4.17)	1.49 (0.32, 3.29)	0.106
Generalised Indecisiveness (GI)	13.9 (5.0)	14.5 (3.6)	0.66 (-0.91, 2.22)	0.409
Need for Career Information (NCI)	24.6 (5.5)	23.0 (4.3)	-1.60 (-3.41, 0.22)	0.084
Need for Self Knowledge (NSK)	17.2 (3.0)	15.1 (3.8)	-2.10 (-3.46, -0.74)	0.003

Table 9 showed unpaired t test for association between semester of study and career indecision. For the career indecisiveness score, the mean for preclinical students was 129.4 and clinical students was 128.3. The mean difference was -1.02 and the 95%

confidence interval was -8.97 to 6.93, p value is 0.801; hence it is not significant. For the CCA score, the mean in preclinical students was 17.6 and clinical students was 19.1. The mean difference was 1.49 and 95% confidence interval was 0.32 to 3.29, the p value is 0.11; hence it is not significant. For the GI score, the mean in preclinical students was 13.9 and the clinical students was 14.5. The mean difference was 0.7 and the 95% confidence interval was -0.91 to 2.22, the p value is 0.409; hence

it is not significant. For the NCI score, the mean in preclinical students was 28.5 and the clinical students was 25. The mean difference was 1.6 and the 95% confidence interval was -3.41 to 0.22, the p value is 0.08; hence it is not significant. For the NSK score, the mean in preclinical students was 20.0 and the clinical students was 18. The mean difference was -2.10 and the 95% confidence interval was -3.46 to -0.74, the p value is 0.003; hence it is significant.

Table 10. ANOVA for association between monthly household income and career indecision (n=121).

Dependent Variable	B40 group Mean (SD)	M40 group Mean (SD)	T20 group Mean (SD)	P value
Career indecisiveness score	120.2 (23.6)	133.2 (20.6)	127.5 (17.2)	0.029
Career choice anxiety (CCA)	16.3 (4.6)	19.8 (4.3)	18.3 (4.8)	0.007
Generalised indecisiveness (GI)	13.9 (3.9)	14.9 (4.2)	13.7 (3.9)	0.304
Need for career information (NCI)	22.2 (5.4)	24.0 (4.7)	23.4 (4.3)	0.277
Need for self knowledge (NSK)	15.2 (3.5)	15.5 (4.2)	16.4 (2.7)	0.394

Table 10 showed ANOVA test for association between monthly household income and career indecision. Regarding career indecisiveness score, B40, M40, T20 group had mean scores of 120.2, 133.2 and 127.5 respectively. The p value for career indecisiveness score is 0.029, which is significant. For the CCA score, the mean for B40 was 16.3, M40 was 19.8, and T20 was 18.3. The p value for the CCA score is 0.007, hence it is significant. For the GI score, the mean for

B40 was 13.9, M40 was 14.9, and T20 was 13.7. The p value for the GI score is 0.304, hence it is not significant. For the NCI score, the mean for B40 was 22.2, M40 was 24.0, and T20 was 23.4. The p value for the NCI score is 0.277, hence it is not significant. For the NSK score, the mean for B40 was 15.2, M40 was 15.5, and T20 was 16.4. The p value for the NSK score is 0.394, hence it is not significant.

Table 11. ANOVA Bonferroni adjustment for monthly household income and career indecisiveness score (SPSS version 12).

	Income	Mean difference	Standard error	P value	95% Confidence Interval Lower bound	95% Confidence Interval Upper bound
B40	M40	-13.0	4.87	0.026	-24.84	-1.18
	T20	-7.3	5.16	0.482	-19.82	5.25
M40	B40	13.0	4.87	0.026	1.18	24.84
	T20	5.8	4.19	0.524	-4.45	15.90
T20	B40	7.3	5.16	0.482	-5.25	19.82
	M40	-5.7	4.19	0.524	-15.90	4.45

For career indecisiveness score, Bonferroni adjustment was done for paired-wise comparison of groups with different monthly income. There was a significant difference between the B40 and M40 group in terms of their career indecisiveness score, based on the mean difference of -13.0, 95% CI -24.8 to -1.2 with p value of 0.026. There was no

significant difference between the B40 and T20 group, as the mean difference was -7.3, 95% CI -19.8 to 5.3 with p value of 0.482. Moreover, there was no significant difference between the M40 and T20 group in terms of their career indecisiveness score, as the mean difference of 5.8, 95% CI -4.5 to 15.9, with p value of 0.524.

Table 12. ANOVA Bonferroni adjustment for monthly household income and career choice anxiety (CCA) score (SPSS version 12).

Income		Mean difference	Standard error	P value	95% Confidence Interval Lower bound	95% Confidence Interval Upper bound
B40	M40	-3.5	1.10	0.006	-6.18	-0.82
	T20	-2.1	1.17	0.246	-4.90	0.79
M40	B40	3.5	1.10	0.006	0.82	6.18
	T20	1.4	0.95	0.393	-0.86	3.76
T20	B40	2.1	1.17	0.246	-0.79	4.90
	M40	-1.4	0.95	0.393	-3.76	0.86

Table 12 showed Bonferroni adjustment for paired-wise comparison of groups with different monthly household income and career choice anxiety score. There was a significant difference between the B40 and M40 group in terms of their career choice anxiety score, evidenced by mean

difference of -3.5, 95% CI -6.2 to -0.8 with p value of 0.006. There was no significant difference between the B40 and T20 group, as mean difference of -2.1, 95% CI -4.9 to 0.8, with p value of 0.246. Moreover, there is no significant difference between the M40 and T20 group on career choice anxiety, as

the mean difference is 1.4, 95% CI -3.8 to 0.9, with p value   of 0.393.

Table 13. Unpaired t-test for parents' occupation and career indecision (n=121).

Dependent Variable	Parents in medical / healthcare profession Mean (SD)	Parents not in medical / healthcare profession Mean (SD)	Mean difference (95% CI)	P value
Career indecisiveness score	131.9 (21.1)	127.9 (20.6)	-4.01 (-13.68, 5.65)	0.872
Career choice anxiety (CCA)	18.7 (5.0)	18.5 (4.7)	-0.18 (-2.41, 2.03)	0.868
Generalised indecisiveness (GI)	15.6 (4.3)	14.0 (3.9)	-1.67 (-3.56, 0.22)	0.083
Need for career information (NCI)	23.4 (5.1)	23.5 (4.7)	0.11 (-2.12, 2.35)	0.919
Need for self knowledge (NSK)	16.2 (3.0)	15.6 (3.8)	-0.53 (-2.24, 1.18)	0.542

Table 13 showed the unpaired t test for association between parents' occupation and career indecision. For the career indecisiveness score, the mean score for students with parents who are in the medical profession was 131.9, while 127.9 for those who are not. The mean difference was -4.01 and the 95% confidence interval was -13.68 to 5.65, p value is 0.872; hence it is not significant. For the CCA score, the mean score for students with parents who are in the medical profession was 18.7, and 18.5 for those who are not. The mean difference was -0.18 and 95% confidence interval was -2.41 to 2.03, the p value is 0.868; hence it is not significant. For the GI score, the mean score for students with parents who are in the medical profession was 15.6, and 14.0 for those who are not. The mean difference was -1.67 and 95% confidence interval was -3.56 to 0.22, the p value is 0.083; hence it is not significant. For the NCI score, the mean score for students with parents who are in the medical profession was 23.4, and 23.5 for those who are not. The mean difference was 0.11 and 95% confidence interval was -2.12 to 2.35, the p value is 0.919; hence it is not significant. For the NSK score, the mean score for students with parents who are in the medical profession was 16.2, and 15.6 for those who are not. The mean difference was -0.53 and 95% confidence interval was -2.24 to 1.18, the p value is 0.542; hence it is not significant.

Table 14. Unpaired t-test for Participation in career development program and career indecision (n=121).

Dependent Variable	Participated in career development program Mean (SD)	Have not participated in career development program Mean (SD)	Mean difference (95% CI)	P value
Career indecisiveness score	127.6 (18.7)	129.0 (21.5)	1.46 (-6.78, 9.70)	0.346
Career choice anxiety (CCA)	18.3 (4.7)	18.7 (4.7)	0.38 (-1.50, 2.28)	0.684
Generalised indecisiveness (GI)	13.3 (4.2)	14.7 (3.9)	1.40 (-0.20, 3.01)	0.086
Need for career information (NCI)	24.2 (4.3)	23.1 (4.9)	-1.05 (-2.95, 0.83)	0.272
Need for self knowledge (NSK)	15.8 (3.6)	15.7 (3.6)	-0.01 (-1.47, 1.45)	0.990

Table 14 showed the unpaired t test for association between participation in career development programs and career indecision. For the career indecisiveness score, the mean score for students who had participated in career development programs was 127.6, and 129.0 for those who had not. The mean difference was 1.46 and the 95% confidence interval was -6.78 to 9.70, p value is 0.346; hence it is not significant. For the CCA score, the mean score for students who had participated in career development programs was 18.3, and 18.7 for those who had not. The mean difference was 0.38 and 95% confidence interval was -1.50 to 2.28, the p value is 0.684; hence it is not significant. For the GI score, the mean score for students who had participated in career development programs was 13.3, and 14.7 for those who had not. The mean difference was 1.40 and 95% confidence interval was -0.20 to 3.01, the p value is 0.086; hence it is not significant. For the NCI score, the mean score for students who had participated in career development programs was 24.2, and 23.1 for those who had not. The mean difference was -1.05 and 95% confidence interval was -2.95 to 0.83, the p value is 0.272; hence it is not

significant. For the NSK score, the mean score for students who had participated in career development programs was 15.8, and 15.7 for those who had not. The mean difference was -0.01 and 95% confidence interval was -1.47 to 1.45, the p value is 0.990; hence it is not significant.

4. Discussion

Our study aimed to determine the prevalence of career indecision among undergraduate medical students in Malaysia. The second objective of this study was to ascertain the correlation between factors such as age, gender, nationality, ethnicity, semester of study in university, household income as well as parents' occupation with the career indecisiveness level. The third objective was to find the association between students' involvement in career development programmes and its impact on career indecisiveness.

From our study, we found that 99.2% of the respondents had a high level of career indecisiveness, whereas only one person (0.8%) had a low level of career indecisiveness. A

study done on Malaysian undergraduate students showed only 51% of students who were career undecided. [18] On the other hand, a study done on graduating medical students in China revealed a high level of lack of career readiness, using the CDDQ questionnaire. [23] For the comparison of each subscale, our mean career choice anxiety (CCA) score was 18.6, mean generalised indecisiveness (GI) score was 14.3, mean career information (NCI) score was 23.5, whereas mean need for self knowledge (NSK) score was 15.8. A research done on undergraduate students in Malaysia revealed scores of 16.7, 14.4, 20.1 and 20.6 for CCA, GI, NCI and NSK subscales respectively. [18] Comparatively, the mean values of three out of the four subscales- CCA, GI and NCI of our study were higher than the literature.

The high level of career indecisiveness among the majority of the medical students could most likely be attributed to the Covid-19 pandemic at the time of our study. Due to the overload of patients, many hospitals were dedicated as Covid-19 hospitals. Additionally, the strict standard operating procedures (SOP) in place greatly limit the number of medical students and time spent in the wards. As a result, most of the clinical classes were shifted online, and students' clinical exposure had been compromised. A study conducted on final year medical students in the United Kingdom revealed around 60% of students felt under prepared for their future career, while 22.7% expressed their lack of confidence in clinical skills and knowledge. [29] Clinical postings are essential for all medical students to familiarise and enhance their skill sets as well as discover their individual niche, which will aid in deciding what to do as a career. A study in the United States also revealed the inconvenient transition from face-to-face classes to virtual teaching amidst the pandemic, in which many faculty members emphasized the irreplaceable value of attending class in-person, as well as the limitations of online classes. The need to create interactive discussions online has become a newfound skill that needs to be mastered in order to ensure that the online experience is adequate in preparing our students for clinical clerkships and beyond. [30]

4.1. Age, Semester of Study and Career Indecision

Our study revealed that there was no significant association of age with career indecisiveness. Among the four subscales, age was significantly associated with need for self knowledge (NSK) score, where students greater than 22 years have lower scores compared to their counterparts below 22 years, and p value was <0.001. This finding corresponded to Super's career development theory, which stated that vocational maturity increases with age. We proved that the greater the age, the better the understanding of one's personal

values and identity. Although the representation is not entirely true, generally medical specialties are person-oriented, and surgical specialties tend to be technique-oriented. [31] With better understanding of oneself, one can make better decisions regarding their future career to suit one's personality and life goals.

On the other hand, the semester of study had similar results as the age. Overall, the association between the semester of study and career indecision was not significant. However, it was significantly correlated with the need for self knowledge (NSK) score. Clinical phase students had lower NSK scores than pre-clinical year students, and the p value was 0.003. Literature showed that clinical exposure in medical schools and experience during elective programs played an important role in one's career decision making. [32] As preclinical year students are yet to have or only have little clinical experience, generally they are expected to have a higher level of career indecisiveness.

4.2. Income Level and Career Indecision

Our study found that monthly household income was significantly associated with career indecision, the p value was 0.029. Among the income groups, M40 group had the highest career indecisiveness score, followed by T20 and B40. When we did the paired wise comparison, the difference between M40 and B40 group was significant. Similar results were seen for the subscale career choice anxiety (CCA) score, where p value was 0.007. Based on literature, there were studies showing income level was negatively correlated with academic performance. [33] Students from lower income groups were thought to have higher motivation than their richer counterparts, and were more concerned for their own future. This pushed them to plan ahead for their future, making them more confident in terms of career decision making.

4.3. Gender, Nationality, Ethnicity, Parents' Occupation and Career Indecision

We found that there was no significant association between gender, nationality, ethnicity, and parents' occupation with career indecision. From literature, there was weak association between gender and career indecisiveness, as different studies had different findings. [18, 34] The nationality of our sample consisted mainly of Malaysians and Sri Lankans. There was no significant difference between these groups in terms of career indecision. Although there was a study that showed significant ethnic differences on indecisiveness scores, the difference was not significant in our study. [35] A study done on Swedish doctors had proved that the medicine profession "runs in the family", where one in five doctors had parents who were doctors. [36] The parental influence on the

child's career decision making is significant. Not only will children look up to their parents as role models, parents can motivate and guide their children to make wise career planning in the medical profession. However, in our study, the association of whether parents are in the medical or healthcare profession was not significant with the level of career indecision.

4.4. Effect of Career Development Program on Career Indecision

In addition, an unpaired t-test was used to determine the association between participation in career development programs and career indecision. It was found to be a non-significant association. Nonetheless, we cannot deny the need for career development programs in the medical curriculum. Study showed that a well-planned career intervention program was effective in reducing career indecision, among pre-university students in Malaysia. [24] In medical education, career planning programs should be given early, upon graduation from secondary school. Medical institutions, along with student-led societies, should also play an active role in organising career development programs, with aims of exposing medical students to the possible career in the medical profession, including non-clinical careers such as medical lecturer, researcher, medical advisor in pharmaceutical companies and public health expert. On the other hand, medical students should also leave their career options open and plan for a career that suits their interest and country's needs. [37] Furthermore, studies have also shown the importance of career counselling in medical education, to help students to make informed decisions before choosing their specialty. [38, 39]

4.5. Limitations of the Study

We have to acknowledge certain limitations of our study. Firstly, our study was conducted via an online questionnaire. Without face to face explanation, there might be some misunderstanding of the questionnaire leading to inaccurate results. Secondly, our sample size might not be representative of the population as our acceptable margin was 9% which was considered a little high. As the majority of the respondents (66.9%) were from clinical phase while only 33.1% were from preclinical phase, this can result in bias in our result. Furthermore, this study only includes medical students from Manipal University College Malaysia, hence the findings cannot be generalised to other medical institutions and is only representative to this institution. Last but not least, the cross sectional study design prevented us from establishing a causal relationship between the independent variables and career indecision. Besides, we could not observe the changes in career decidedness over time, as students may become more career decided as they progress in their studies.

4.6. Recommendations

Our study findings clearly suggested the lack of career decidedness among medical students in this time and era. Further studies can be done to explore the association of other factors with career indecision, for example academic performance, coping strategies and mental health status of the students. As the experience in clinical rotation and elective make up a significant portion of the career decision making, future study can include these elements, looking for any significant association. To assess the effect of the career development program, qualitative study can be done so that the program is tailored to suit the needs of medical students and graduates. Career planning should be included in early years of medical education so that medical students will be better prepared for their future career. Medical institutions should also include career counselling as part of the undergraduate medical training, in order to aid students to make better career choices.

5. Conclusion

In summary, our study found that the majority of undergraduate medical students in our college had a high level of career indecisiveness. Age and semester of study significantly associated with need for self knowledge, a subscale under career indecision. Monthly household income had significant association with career indecision. Only less than one third of medical students have participated in any career development programs. Further studies have to be done to explore the causative factors of career indecision. Our study findings will serve as a reference for the improvement of undergraduate medical education, in order to better prepare medical students for their future career.

Acknowledgements

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