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Research Article

A Survey of Medical Students' Attitudes Concerning Career Decisions

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Abstract

Aim: There is currently a chronic shortage of surgeons in Japan. We assessed the attitudes of medical students regarding preferred lifestyles and specialties, aiming to identify strategies for increasing the number of surgeons in Japan.

Methods: We conducted a questionnaire survey among medical students, to assess their career priorities and ideal lifestyles when choosing specialties. Out of a total of 123, 63 were male, 51% of the total. Differences were compared between grade and sex.

Results: Overall, factors which is the most important were how interesting, the atmosphere in the department, and whether it is challenging, while dedication to the work, designing a life without family, and career advancement were the least important. The importance of acquiring useful skills and training in the neighboring Tokai area tended to increase significantly with increasing grade. Females were significantly concerned about a heavy workload and less likely to prefer surgeons.

Conclusions: Most students determined their ideal career path in the lower grades, and the factors they considered important or neglected were the same regardless of grade level or gender. In order to increase the number of surgeons, it is necessary to improve the current surgeons' lifestyle and appeal to their demands.

Keywords: Controlled lifestyle; Sex discrimination; Heavy workload; Shortage of surgeon; Work-life balance

Introduction

Perceived poor access to postgraduate training and heavy workload dissuade students worldwide from considering careers in surgery [1]; furthermore, interest in surgery among medical students has declined over the past decade [2]. Incompatibility with lifestyle or family commitments was noted to be the main reason for not wishing to pursue a career in surgery, which was closely followed by poor teaching of anatomy at medical school and perceived strong, competitive, and aggressive surgical culture [3]. Uncontrolled lifestyle results from situations which surgeons must be available all times for emergent surgeries or high demand with a limited number of surgeons. In addition, limited exposure to surgery and the operating room during medical school may deter students from entering surgical careers [2]. Similar problems have also been noted in Japan [4].

Nearly half of the medical school graduates are females who are less likely to pursue a career in surgery [5]. Female residents reportedly often discourage female medical students from pursuing a surgical career, specifically because of the difficulties in balancing pregnancy and motherhood with training [5]. Interestingly, however, residents in the United Kingdom reportedly had a strong desire to choose cardiac surgery once they had an experience in the department [6]. Cardiothoracic surgery has been shown to be the least popular subspecialty for core surgical trainees across all surgical fields; however, among those who have had earlier experience in the specialty, it is immensely popular [6]. Some trainees have reported that workshops have a significant effect in influencing undergraduate medical students toward a career in cardiothoracic surgery [7]. Are there factors of intervention early in the school year that would change the outcome? The present study aimed to assess the attitudes of medical students regarding preferred lifestyles and medical specialties, with the goal of identifying strategies for increasing the number of surgeons in Japan.

Methods

We conducted a questionnaire survey among second- and fifth-year medical students at Aichi Medical University, Japan. Out of a total of 123, 63 were male, 51% of the total, and 69 second-year and 54 fifth-year students were included. The differences in outcomes were compared between the school year and sex. We examined whether there is a change in attitudes toward the future with increasing grade and different genders.

The survey comprised seven sections that included 23 questions (Figure 1). The questions asked about general background, ideal lifestyles, and preferences of the medical students. As the general background, they were asked age, sex, whether they had role models, whether they were interested in a surgical or cardiac surgical career, and training site preference. Impressive experiences were defined as those experiences that were inspiring through movies, books, etc. related to medicine. Regarding an ideal lifestyle, questions about their ideal career path, work-life balance, whether they had wishes of having a family, whether they were interested in dedicating themselves to

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Questionnaire Figure 1

1. Have you ever had impressive experiences by watching medical books, dramas, and movies?
2. Have you ever met role models?
3. Have you already chosen a specialty? If yes, which field did you choose?
   Yes, surgeon
   Yes, physician
   Yes, other clinician, such as radiologist, anesthesiologist, or psychiatrist
   Yes, basic medicine
   No, not yet.
4. How much have you considered cardiac surgery?
   Not a candidate at all
   Rather not be a candidate
   Can't say either way
   I would consider being a candidate
   Very interested in being a candidate
5. What kind of hospital are you planning to work in as a trainee?
   Large hospital in Tokai area
   Small hospital in Tokai area
   Large hospital in other areas
   Small hospital in other areas
   Not yet
6. Which considerations are important for your ideal life-style? (Yes or no)
   a. side business
   b. Private life with hobbies
   c. A life centered on my private interest
   d. A life centered on having a family
   e. Dedication to work
   f. Career advancement
   g. Not interested in having a family
7. How important are the following factors for choosing a career path? 1) strongly disagree, 2) disagree, 3) neither agree or disagree, 4) agree, 5) strongly agree
   a. Training period
   b. Interest in the area
   c. Rewarding
   d. Acquire useful skills
   e. Salary
   f. Potential for lawsuits
   g. Heavy workload
   h. Overtime work or urgent calls
   i. Secure welfare
   j. Harassment
   k. Atmosphere of the department

Age ( ) Male・Female Thank you for your cooperation

Figure 1: Questionnaire.

their work, and whether they were interested in career advancement were asked. The students were also asked about their priorities for decision-making in specialty preferences; if they had concerns about training period, interest in the area, rewarding, acquired skills, salary, lawsuits, heavy workload, overtime working or urgent calls, personal welfare, harassment, and having a good departmental atmosphere. The answers were assigned grades by the students to indicate their level of interest or concern.

The second-year medical students in our university study basic medicine and general liberal arts, and their questionnaire survey was administered in a class about professionalism. The fifth-year medical students had started their first-year clinical internship at Aichi Medical University Hospital, and their questionnaire survey was administered during their training in the Department of Cardiac Surgery. However, in 2020, some students could not attend the training because of self-isolation due to the coronavirus disease 2019 outbreak.

All procedures were performed in accordance with the protocols of the Ethics Committee of Aichi Medical University Hospital. The identities of the students were protected. All students provided written consent regarding use of the data containing their answers in scientific presentations or publications.

Data analysis and statistical methods

Continuous variables are expressed as the mean ± SD or median (range), and categorical variables are expressed as the number (%) of patients. Data were analyzed by Fisher's exact test for categorical variables. Continuous variables were compared using the student's t-test, whereas the Mann-Whitney U-test was used for nonparametric variables. All data analyses were performed with JMP 16.1 software (SAS Institute, Cary, NC, USA). P<0.05 was considered statistically significant.

Results

Our study population comprised 123 medical students from one private medical university. The response rate was 74% (69/93) for the second-year students and 50% (54/108) for the fifth-year students. The response rate was small because of the abovementioned self-isolation of the fifth-year students. Moreover, some students were absent from the class or refused to answer the questionnaire. There were 69 second-year students (36 males, 52%) and 54 fifth-year students (27 males, 50%). Overall, 63 (51%) of the respondents were male.

The results for all students are shown in Table 1 and Figure 2. Overall, the top three factors of their priorities for decision-making in specialty preferences or their ideal lifestyles were how interesting (93%), the atmosphere in the department (93%), and whether it is challenging (89%), while dedication to the work (7%), designing a life without family (7%), and career advancement (14%) were the bottom three factors.

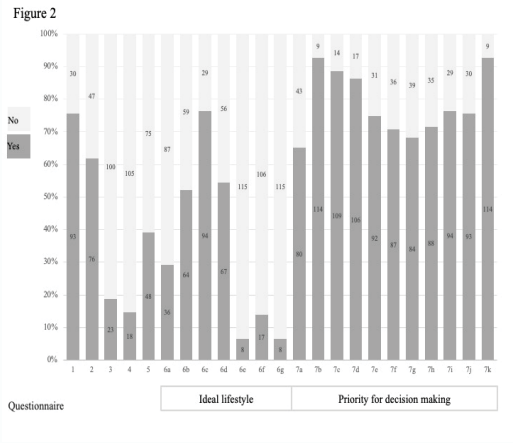

Figure 2: Questionnaire results of all students.

Table 1: Results for all students.

Questionnaire		Number 123 (%)
	Age (y)	22.1 ± 2.01
	Sex (male, %)	61 (50)
1	Whether impressive experiences (%)	93 (76)
2	Whether having role model (%)	76 (62)
3	How interested in surgeon (%)	23 (19)
4	How interested in cardiac surgeon (%)	18 (15)
5	Whether training at the hospital in Tokai area (%)	48 (39)
6a	How interested in side business (%)	36 (29)
6b	How important a personal life (%)	64 (52)
6c	How much guaranteed private life (%)	94 (76)
6d	How important a family-centered life (%)	67 (54)
6e	How important in dedication to work (%)	8 (7)
6f	How important in career advancement (%)	17 (14)
6g	How important a life without family (%)	8 (7)
7a	How long duration of training required (%)	80 (65)
7b	How interesting work (%)	114 (93)
7c	How challenging work (%)	109 (89)
7d	Whether useful skills acquired (%)	106 (86)
7e	How much salary (%)	92 (75)
7f	How many lawsuits (%)	87 (71)
7g	How heavy workload (%)	84 (68)
7h	How less frequent overtime work or urgent calls (%)	88 (72)
7i	How secure welfare (%)	94 (76)
7j	How less harassment (%)	93 (76)
7k	How good atmosphere of the department (%)	114 (93)

Table 2 present the results of the comparisons between the second-year and fifth-year students. With increasing the grade, more students tended to give importance to acquiring useful skills (p=0.0024) and wanting to train in the neighboring Tokai area (p<0.0001) significantly. Other factors including how interesting, the atmosphere in the department, and whether it is challenging were

not significantly changed with grade level and were at the top of the list. On the other hand, factors including dedication to the work, designing a life without family, and career advancement remained at the bottom of the list in both grades.

Table 3 present the results of the comparisons by sex. While male medical students were significantly older (p=0.0079) and more interested in side business (p=0.041), females were significantly concerned about a heavy workload (p=0.0099), less likely to prefer surgery (p=0.0057) and had more impressive experiences in their lives so far (p=0.0026). However, above-mentioned factors including how interesting, the atmosphere in the department, and whether it is challenging were at the top of the list in both genders. Further, factors at the bottom of the list were dedication to the work, designing a life without family, and career advancement in both genders.

Discussion

A not just surgeon, the shortage of cardiac surgeons is a global problem [8]. The major reasons for the decrease in the number of cardiac surgeons are uncontrolled and difficult lifestyle, competitive and aggressive culture, and very long training period [3,9]. There has also been a tidal change in recruitment into cardiothoracic surgery careers, with declining applicant numbers in the United Kingdom [7]. In Canada, surgical specialties have also seen a reduction in applications, whereas an increasing proportion of applications for "controlled lifestyle" specialties, such as radiology, emergency medicine, and anesthesiology [2]. Uncontrolled lifestyle results in situations which surgeons must be available all times for emergent surgeries or high demand with a limited number of surgeons. Here, in Japan, we suffer from the same crisis [4]. The present survey showed interesting similarities and differences compared to previous ones conducted in other countries. Most students regardless of their school year or sex gave importance to how interesting, the atmosphere in the department, and whether it is challenging; on the other hand, they disregarded dedication to the work, designing a life without family, and career advancement. Especially female students were significantly concerned about a heavy workload and less likely to prefer surgery. With increasing the grade, more students tended to give importance to acquiring useful skills significantly. Although medical students in our university want a future carrier pass that is realistically skilled and rewarding, they have no intention of devoting their lives to work without a family.

The survey results reveal that appeal to medical students regarding dedication to work or career advancement would not be useful. To increase the number of surgeons, working surgeons should change their work-centered lifestyle into a controlled lifestyle that provides adequate work-life balance. Further, we need to highlight good work environment and recognize most students' desire to have a family and be able to spend sufficient time with them. Moreover, it goes without saying that prospective students should be interested in surgery and that rewarding work, acquisition of very useful skills, and good departmental atmosphere are important.

The present survey revealed that female students particularly considered a heavy workload to be a significant problem and were less likely to consider becoming surgeons compared with male students. One of the major reasons for the decrease in the number of surgeons is that the number of female medical students has been increasing. Female students are less likely to pursue a career in surgery [1]. According to an American survey of female surgical residents who were pregnant, 29% considered dropping out and nearly 30% would advise female medical students to pursue a different career [10]. The main cause of discouragement and attrition in female residents was the difficulty in balancing pregnancy and motherhood with training [5]. The perception of sex discrimination is frequently reported during surgical experiences and has been shown to decrease interest in the pursuit of further surgical training [2]. The lack of female role models has also been reported as a cause of reduced interest in surgery among female students [2]. On the other hand, while the male students were

Table 2: Results of the comparisons between the second-year and fifth-year students.

Questionnaire		Second-year (n=69)	Fifth-year (n=54)	P value
	Age (y)	21.0 ± 0.20	23.3 ± 0.22	<0.0001
	Sex (male, %)	36 (52)	27 (50)	0.81
1	Whether impressive experiences (%)	49 (71)	44 (81)	0.13
2	Whether having role model (%)	45 (65)	31 (57)	0.45
3	How interested in surgeon (%)	10 (14)	13 (24)	0.11
4	How interested in cardiac surgeon (%)	10 (14)	8 (15)	0.81
5	Whether training at the hospital in Tokai area (%)	15 (22)	33 (61)	<0.0001
6a	How interested in side business (%)	18 (26)	18 (33)	0.5
6b	How important a personal life (%)	31 (45)	33 (61)	0.68
6c	How much guaranteed private life (%)	51 (74)	43 (80)	0.11
6d	How important a family-centered life (%)	36 (52)	31 (57)	0.69
6e	How important in dedication to work (%)	6 (9)	2 (4)	0.25
6f	How important in career advancement (%)	9 (13)	8 (15)	0.77
6g	How important a life without family (%)	4 (6)	4 (7)	0.72
7a	How long duration of training required (%)	44 (64)	37 (69)	0.79
7b	How interesting work (%)	63 (91)	52 (96)	0.83
7c	How challenging work (%)	61 (88)	49 (91)	0.93
7d	Whether useful skills acquired (%)	55 (80)	52 (96)	0.0024
7e	How much salary (%)	49 (71)	44 (81)	0.3
7f	How many lawsuits (%)	52 (75)	35 (65)	0.16
7g	How heavy workload (%)	51 (74)	34 (63)	0.1
7h	How less frequent overtime work or urgent calls (%)	50 (72)	39 (72)	0.72
7i	How secure welfare (%)	53 (77)	42 (78)	0.97
7j	How less harassment (%)	52 (75)	42 (78)	0.97
7k	How good atmosphere of the department (%)	63 (91)	52 (96)	0.58

Statistical significance was defined as p<0.05

Table 3: Results of the comparisons by sex.

Questionnaire		Male (n=63)	Female (n=60)	P value
	Age (y)	22.5 ± 0.25	21.6 ± 0.26	0.0079
	Fifth year (%)	27 (43)	27 (45)	0.81
1	Whether impressive experiences (%)	40 (63)	52 (87)	0.0026
2	Whether having role model (%)	33 (52)	40 (67)	0.11
3	How interested in surgeon (%)	17 (27)	5 (8)	0.0057
4	How interested in cardiac surgeon (%)	10 (16)	7 (12)	0.5
5	Whether training at the hospital in Tokai area (%)	24 (38)	23 (38)	0.98
6a	How interested in side business (%)	23 (37)	12 (20)	0.041
6b	How important a personal life (%)	49 (78)	44 (73)	0.45
6c	How much guaranteed private life (%)	36 (57)	27 (45)	0.18
6d	How important a family-centered life (%)	34 (54)	32 (53)	0.95
6e	How important in dedication to work (%)	4 (6)	4 (7)	0.94
6f	How important in career advancement (%)	7 (11)	10 (17)	0.37
6g	How important a life without family (%)	4 (6)	4 (7)	0.94
7a	How long duration of training required (%)	42 (67)	38 (63)	0.8
7b	How interesting work (%)	58 (92)	56 (93)	0.69
7c	How challenging work (%)	54 (86)	55 (92)	0.14
7d	Whether useful skills acquired (%)	54 (86)	52 (87)	0.47
7e	How much salary (%)	47 (75)	45 (75)	0.82
7f	How many lawsuits (%)	42 (67)	45 (75)	0.23
7g	How heavy workload (%)	37 (59)	47 (78)	0.0099
7h	How less frequent overtime work or urgent calls (%)	42 (67)	46 (77)	0.15
7i	How secure welfare (%)	46 (73)	48 (80)	0.32
7j	How less harassment (%)	45 (71)	48 (80)	0.18
7k	How good atmosphere of the department (%)	57 (90)	57 (95)	0.1

Statistical significance was defined as $p<0.05$

realistic in their interest in side businesses, the female students had interesting experiences in their lives so far. In order to make talented and passionate female candidates to pursue surgical careers, we need to show ways to distribute heavy workloads with gaining experience without being affected by childbirth or childcare leaves.

Additionally, some studies have reported that early exposure to surgeries and communication with surgeons was effective for increasing interest among medical students in surgical careers [3,11]. The study found that little or no change in survey results occurred early in the school year, suggesting the importance of intervening and generating interest in surgery early in medical school. Furthermore, Burnside et al. [6] reported that residents had a strong desire to choose cardiac surgery once they had gained experience in the field of cardiac surgery. Cardiothoracic surgery has been shown to be the least popular subspecialty for surgical trainees, but it is immensely popular among those who have previously worked in the specialty [6]. In the present study, most students prioritized acquiring useful skills, working in a specialty that interested those, performing rewarding work, and a good departmental atmosphere when deciding their future career path. In accordance with these results, working and teaching surgeons should consider establishing good relationships with students in early grades and giving residents opportunities to acquire useful skills. An interesting finding was that the number of medical students who realistically wanted to train in the neighborhood increased as the school year progressed. It may be a characteristic of a private university, but it is assumed that they tend to desire stability rather than adventure in career planning.

Our study had several limitations. First, we were able to collect data from only one institution, which may undermine the general applicability of our findings. Second, because our university is private, it may differ in some ways from national and public universities. Third, the results may not be universal because student awareness changes year to year. Nevertheless, our findings provide some insight into how to overcome the current worldwide shortage of not only cardiac surgeons but surgeons.

Conclusion

Although medical students consider training in nearby areas and acquiring useful skills with increasing grade, and females were significantly concerned about a heavy workload and less likely to prefer surgery, most students gave importance and disregarded in mostly same things. In order to increase the number of surgeons, intervention in the early grades for medical students, providing appropriate opportunities for residents and lifestyle changes in surgeons themselves are needed.

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Ethics Approval and Consent to Participate

The need for ethics approval was waived in accordance with the protocols of the Ethics Committee of Aichi Medical University Hospital. In this study, verbal consent was obtained because it is based on a non-invasive questionnaire for medical students and the identities of the students were protected. In addition, the ethics committee approved this procedure.

Consent for Publication

The student provided permission to publish the features of survey. The identity of the student has been protected.

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