

Factors Influencing the Choice of Anesthesiology as a Specialty by Medical Students at a University in Manila*

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ABSTRACT

Anesthesiologists are pioneers in perioperative medicine, intensive care, pain management and patient safety. However, anesthesiology is not among the top specialties considered as a future career by medical students. The study aims to identify factors that influence fourth-year medical students' (clinical clerks) choice of anesthesiology for specialty training in the future. A cross-sectional research study, that was conducted between October to November 2019 among fourth-year medical students of the University of Santo Tomas-Faculty of Medicine and Surgery who underwent their clinical rotation in anesthesiology. Data were collected using a self-administered questionnaire. The questionnaire included demographic characteristics, specialty preferences, what factors attract the respondents to choose their preferred specialty and how these relate to choosing anesthesiology as a career. Summarization of data was done using frequencies/proportions and graphs, and significance level was set at *P*-value less than 0.05.

The following factors influence the choice of anesthesiology as a top three preferred specialty as a career: personal interest, positive influence during clerkship, income, enough time for leisure activity, and short length of training.

INTRODUCTION

I. Background and Significance of the Study

Medicine is a vocation. It is service-oriented filled with meaning and the purpose of using a physician's knowledge and skills "in the service of protecting and restoring human well-being" (1). The field of anesthesiology is a specialty where a physician can apply knowledge and skills toward patient care with effects that are immediately visible. Anesthesiologists are pioneers

in perioperative medicine, intensive care, pain management and patient safety (2). Aside from operating rooms, anesthesiologists also provide patient care in non-operating room areas like the intensive care units, pain clinics and remote locations such as radiology suites, endoscopy units, cardiac catheterization laboratories and the like. In the future, the services of anesthesiologists will be in high demand as the life expectancies of patients increase and with it, more co-morbidities. Technology has become advanced with more less-invasive procedures that will be developed requiring patients who are still, sedated, and pain-free.

Anesthesiology is ranked low among the medical specialties considered by medical students as a future career. Reasons include incomplete understanding of the roles of an anesthesiologist in patient care (3). Studies have shown that gender is a factor in choice of specialty, with females more likely to consider anesthesiology as a career. (4,5). Lifestyle is also one of the factors that influenced senior medical students. Anesthesiology, along with radiology and emergency medicine have been identified as specialties that provide controllable lifestyles (CL) (6).

As of December 2017, doctors rank second among the top four categories of health professionals working in health institutions in the Philippines, 91% of which are working in hospitals and the remaining 9% working in the non-hospital and primary care setting (7,8). In a survey done by the Pharmaceutical and Health Care Association of the Philippines (PHAP), 68% of the physicians surveyed are specialists and 32% are general practitioners. Among the medical specialties, the most common are internal medicine (17.5% of all physicians), pediatrics (15.5%), obstetrics and

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gynecology (12.5%) and surgery (10.6%). Anesthesiology is not included among the top ten medical specialties in the Philippines.

According to the Bland-Meurer model of medical specialty choice, medical students were able to choose their future medical specialty when their perception of the specialty and their personal and social needs align. (9). In a systematic review by Querido et. al, there are five main categories of factors affecting choice of medical specialty: medical school characteristics, in which the school influenced the students perception of different medical specialties; student characteristics such as age and gender; student values, career needs to be satisfied such as personal preferences; career needs that must be met such as work-life balance, and perception of specialty characteristics. (10)

Multiple studies showed that the personal and clinical experiences of medical students have a big impact in their choice of medical specialty. These include physician role models, work environment and positive encounters with patients and physicians in the fields they are interested in. (11,12,13)

A total of 911 senior medical students surveyed in 4 studies showed that the top 4 preferred specialties were internal medicine, obstetrics and gynecology, pediatrics and surgery. The most common influential factors were intellectual content of the specialty, career opportunities, experience during clerkship, controllable lifestyle and doctor-patient relationship. (4,5,14,15) Among the least common influential factors were prestige of the specialty and income.

Specialties identified to provide controllable lifestyles (CL) include emergency medicine, dermatology, anesthesiology, radiology, neurology, ophthalmology, pathology and psychiatry. According to a study done by Schwartz, these CL specialties saw an increased interest from senior medical students in the United States during the period of 1978-2001. In contrast, non- CL specialties such as family medicine, internal medicine, pediatrics and general surgery experienced declined interest. (16)

Anesthesiology consistently ranked low among the top specialty choices by graduating medical students. Numerous international studies (17,18) noted less than 5% of graduating medical students expressed interest in anesthesia. Factors that influenced their choices include personal interest, future job opportunities and requirement of specialized skill. The most frequently-named factors for not choosing anesthesiology are long work hours and high stress level, insufficient mentorship, and low job opportunity. (17)

In studies conducted among residents training in anesthesiology by Charuluxanan and Augustin, reasons for choosing anesthesiology are responsibility of patient on a per case basis, influenced by an anesthesiologist as a role model, limited number of patients under responsibility, anesthesiology is a "hands-on" specialty, inclusion of critical care medicine in the scope of training/practice, opportunities to perform invasive procedures and work gratification. (20,21) These residents also rated their specialty training in anesthesiology as highly satisfactory, and would choose the same specialty again if given the chance.

Thus, the aim of the study is to determine the factors that influence the choice of anesthesiology as a future career by fourth-year medical students. Identifying the factors could have an influence on the improvement of the clinical rotation of the students in anesthesiology, maximize their exposure to the field of anesthesiology and encourage and nurture potential future anesthesiologists.

Objectives

1. General Objective
 - a. To determine the factors that influence the choice of anesthesiology among fourth-year medical students as a future specialty
2. Specific Objectives
 - a. To identify and measure the following factors:
 - i. Residency programs most likely to be selected by students
 - ii. Attitudes of fourth-year medical students regarding anesthesiology as a specialty

II. Scope and Limitations

This cross-sectional study is limited to the determination of factors that influence the choice of anesthesiology as a future career by fourth-year medical students of the University of Santo Tomas-Faculty of Medicine and Surgery.

The study was conducted among fourth-year medical students currently enrolled at the University of Santo Tomas Faculty of Medicine and Surgery, a private academic institution. As fourth-year (clinical clerks), they undergo a permanent rotation to the department of anesthesiology incorporated into the two-month rotation in the department of surgery. The findings of the study may or may not be similar among graduating medical students of other institutions.

After fourth-year (clinical clerkship), the medical graduates have to undergo a one-year postgraduate internship program. During this time their decision may change regarding their choice of specialty training.

METHODOLOGY

I. Study Design

This is a cross-sectional research study, which was conducted among fourth-year medical students (clinical clerks) of the University of Santo Tomas Faculty of Medicine and Surgery using a self-administered questionnaire. Following approval from the USTH Institutional Review Board, data was collected from October to November 2019.

II. Study Site

The study was conducted at the University of Santo Tomas Hospital, a tertiary private institution located in the City of Manila.

III. Study Population

Fourth-year medical students (clinical clerks) of the University of Santo Tomas – Faculty of Medicine and Surgery

Inclusion Criteria

1. Currently undergoing their clinical rotation in anesthesiology
2. Completed their clinical rotation in anesthesiology

Exclusion Criteria

1. Did not undergo clinical rotation in anesthesiology
2. Does not intend to undergo residency training

Termination Criteria

1. Insufficient data on the questionnaire

IV. Sampling Methodology

Convenience sampling was employed to select study participants. Survey questionnaires will be distributed at the end of their clinical rotation in anesthesiology.

V. Sample Size Determination

OpenEpi was used to calculate the minimum sample size of the study. Specifying a design effect of 1, margin of error equal to 5%, and finite population of 500, the minimum sample size required is 217 at a confidence level of 95%. However due to the feasibility to achieve the required sample size, the confidence level was adjusted to 80%, with the computed sample size of 124.

VII. Data Collection and Analysis

Questionnaires were distributed to fourth-year medical students (clinical clerks) at the end of their clinical rotation in anesthesiology. Written informed consent was obtained from those who are willing to participate. Students who did not wish to take part in the study were not compelled or persuaded to do so. The questionnaires were personally administered by the author. A designated envelope was prepared where the accomplished questionnaires were kept.

The questionnaire used elicited information on socio-demographic characteristics, decisions

about specialization, and possible factors that affected choice of specialty. The factors selected were obtained from the literature review. A total of 24 factors indicated in the questionnaire as influencing choice of specialty were categorized into experiences during undergraduate training, personal factors and specialty-related factors. Provision was also made for other factors not included in the questionnaire.

VII. Data Analysis Plan

Data was encoded in MS Excel by the researcher. Statistical analyses were done using SPSS version 20. In testing each influencing factor's association with the inclusion of anesthesiology in the preference, Cramer's V coefficient was used at 20% level of significance. Aside from comparing each influencing factors one by one, multiple logistic regression was used to compare which among all of the influencing factors appear to be significantly contributing to the inclusion of anesthesiology in the preference. Positive and negative contributors were noted also at 20% level of significance.

RESULTS AND DISCUSSION

A total of 146 questionnaires were completed. Majority of the respondents were female (56%), single (97.9%), with an average age of 24.3 years old. Twenty-three percent (23%) of the respondents' fathers and 31% of the respondents' mothers are into professions related to healthcare. Majority of the respondents' education were supported by both parents (75%) while 5% had scholarship grant as students. Ninety-seven (97%) expressed interest to go to subspecialty training.

Figure 1 showed that among all the specialties listed, Surgery was preferred the most, followed by Anesthesiology and Internal Medicine. As for the first choice, the most preferred specialty is Surgery, followed by Internal Medicine and Pediatrics. As a second choice, the top three specialties are Surgery, followed in second place by Internal Medicine, Anesthesiology and Orthopedics, and Pediatrics. For the third choice the top three specialties are Anesthesiology, Surgery and Neurology and Psychiatry. Of note is that respondents surveyed were currently in the middle of their Surgery rotation.

Figure 1. Breakdown of Respondents Including the Specializations in the

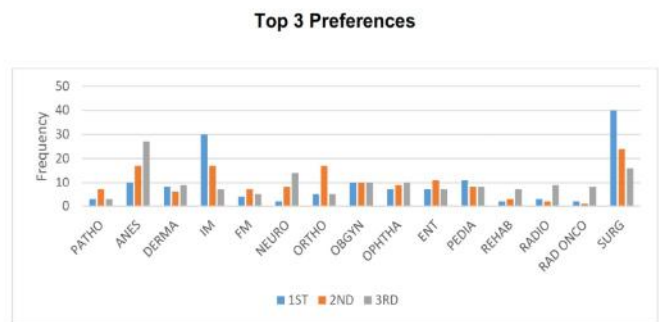


Table 1 showed the most common factors that influenced the choice of specialty are personal interests (97.9%), future job opportunities (88%), income (82%) and lifestyle and rewards and opportunity for private practice (80%). The factors that showed the least influence during subspecialty choice are little on-call commitment and others' perception of the job (36%), low risk of litigation (28%), and opportunity to do research, and gender distribution in specialty (16%). At the end of the respondents' anesthesiology rotation, they were inspired to take anesthesiology as a future career (39%). At the same time, 32% of the respondents showed that although the rotation inspired interest in anesthesiology, they will not choose it because of their perceived little success in the field. Four (4) respondents were decided to pursue anesthesiology prior to the anesthesiology rotation while the nine (9) respondents were decided against a career in anesthesiology. In addition, the demographic characteristics of the respondents did not significantly influence the respondents' decision to specialize in anesthesiology. Table 2 showed respondents indicated opportunity to do research, little on-call commitment, low risk of litigation, and gender distribution in specialty as the influencing factors. These were also the factors mostly associated with the negative choice and not including anesthesiology among the top three preference; while those respondents who indicated personal interest, positive influence during clerkship, income, enough time for leisure activity, and short length of training were mostly associated with respondents choosing anesthesiology in their top three preference. (See Appendix D for tests for association).

Table 1. Factors Influencing Fourth-year medical students in Choosing a Specialty

Influences	Percentage
5 Most Influential	
Personal Interest	97.9
Future Job Opportunities	88
Income	82
Lifestyle and Rewards	82
Opportunity for Private Practice	80
5 Least Influential	
Little On-Call Commitment	36
Other People's Perception of the Job	36
Low Risk of Litigation	28
Opportunity to do Research	16
Gender Distribution in Specialty	16

Among the 24 influencing factors, the logistic model was able to identify significant factors affecting the inclusion of anesthesiology in preference (Table 3). Influencing factors such as Influence from a mentor, and other people's perception of the job were found to decrease the probability of including anesthesiology in the top three preference. This was shown by having p-values less than 0.2 and with beta coefficients (B) less than 0. On the other hand, influencing factors such as Prestige, Positive Influence During Clerkship, Enough Time For Leisure Activity, Short Length of Training, and Gender Distribution of Specialty were found to increase the probability of including anesthesiology in the top three preference. This was shown by having p-values less than 0.2 and with beta coefficients (B) greater than 0.

**Table 2. Factor Analysis
Choice of Anesthesiology**

Positively Associated With	Negatively Associated With
Personal Interest	Opportunity to do research
Positive Influence During Clerkship	Little on-call commitment
Income	Low risk of litigation
Enough time left for leisure activity	Gender distribution in specialty
Short length of training	

Table 3. Coefficients of Influencing Factors to Inclusion of Anesthesiology in Preference

Influencing Factors	B	S. E.	Wald	df	p-value	Exp(B)
Personal Interest	20.762	23205.423	.000	1	.999	103.9
Future Job Opportunities	-.615	.798	.594	1	.441	.541
Specialized Skill	-.615	.579	1.129	1	.288	.540
Lifestyle	-.879	.642	1.877	1	.171	.415
Prestige	.878	.506	3.006	1	.083	2.405
Close Interaction	.615	.538	1.307	1	.253	1.850
Clerkship Influence	1.907	.676	7.953	1	.005	6.730
Research	-.524	.587	.797	1	.372	.592
Flexibility	-.844	.704	1.437	1	.231	.430
Patient Contact	-.171	.571	.089	1	.765	.843
Technically Challenging	-.412	.531	.601	1	.438	.662
Income	.873	.771	1.279	1	.258	2.393
Private Practice	-.709	.663	1.145	1	.285	.492
Compatible with Family	-.412	.588	.490	1	.484	.663
Inclination of Specialty	-.316	.583	.294	1	.588	.729
Variety of Caseload	-.196	.560	.123	1	.726	.822
Mentor Influence	-.941	.553	2.895	1	.089	.390
Time for Leisure	1.744	.742	5.527	1	.019	5.720
Short Training	.785	.550	2.036	1	.154	2.191
Family Influence	-.092	.533	.030	1	.862	.912
Perception	-.871	.571	2.328	1	.127	.419
On call	-.294	.634	.215	1	.643	.745
Low risk of Litigation	.453	.625	.525	1	.469	1.573
Gender Distribution	1.658	.682	5.909	1	.015	5.251
Constant	-21.203	23205.423	.000	1	.999	.000

As shown consistently with other published studies, medical students have placed importance on the lifestyle, and amount of leisure and personal time as influencing factors in the choice of specialty. Anesthesiology was frequently seen as a specialty that provides controllable lifestyle (CL), or the ability to control work hours, together with radiology, and emergency medicine. In the study by AlKhilawi et. al, sixty (60) percent of their respondents chose controllable lifestyle as an important criterion for selection of residency programs (6,15,22,23). Aside from controllable lifestyle, income is another influencing factor that is seen in other studies as well. The specialty-related factors for selecting anesthesiology included controllable lifestyle/flexible work schedule (EOI of 53.00%), career opportunities (EOI of 44.00%), workload (EOI of 37.99%) and training length (EOI of 32.30%). (3,20,23)

Gender bias exists when it comes to choosing specialty for training as shown in multiple studies. Studies by AlKhilawi, Dossajee and Khader showed that females tend to choose anesthesiology more than males. Females tend to select specialties such as anesthesiology, pediatrics, obstetrics and gynecology and radiology. Males lean more into specialties such as surgery, internal medicine and orthopaedics (4,5,15). In this study, the respondent's demographics did not significantly influence the choice of anesthesiology as one of the top three preferred specialties.

Positive influence during clerkship is also an influencing factor for a student to choose anesthesiology as a career. In a study by Robertson et. al, shadowing and mandatory rotation were almost equally chosen (94 and 90 responses, respectively) as the preferred methods to learn more about anesthesiology (22). Career choices are usually made during medical school, that can change over time as the students progress into their medical education. Exposure to a specialty during clerkship encourages students to learn more about the specialty, increases awareness of the range of the specialty and provides hands-on experience regarding the needed skills to be successful in that specialty. In this study, 46 out of 54 respondents who picked anesthesiology as one of their top three preferred

specialties chose positive influence during clerkship as one of the influencing factors, and it is significant. The mandatory clinical rotation of the students in the Department of Anesthesiology consists of daily lectures/case discussions/conferences, exposure to anesthesia induction and maintenance inside the operating room, essential pain management workshop and demonstration of skills such as intubation using mannequins. Feedback from the students showed that interactive lectures, operating room exposure and the essential pain management workshop were the most enjoyable part of their rotation, while the on-call nature, few number of cases observed, less patient interaction and short duration of rotation were found to be the least enjoyable.

Influence from a mentor or family members is cited as one of the influencing factors. In a study by Edem et. al (17), one-third or 30% of the respondents were influenced by a mentor or a family member regarding their choice of specialty. Another similar study showed that two-thirds of the respondents who have a positive role model during the clinical rotation was significantly associated with a career intention towards anesthesiology. In this study, influence from a mentor or a family member is not an influencing factor for choosing anesthesiology as a top three preferred specialty.

The respondent's decision to pursue anesthesia is also an influencing factor. Decision to pursue anesthesiology before and after clinical rotation are factors that affect inclusion of anesthesiology in their top three preferences. In a study by Bland et. al, forty-one (41%) of students reported making their decision after or during the third year in medical school. Of these, 20% made the choice in the fourth year and approximately 14% made their respective specialty choice before entering medical school (6). In this study 12 respondents or 8% were already decided for or not choosing anesthesiology even before their anesthesiology rotation started, while 23 respondents (15%) who were inspired to consider anesthesiology as a career actually chose anesthesiology as one of their top 3 preferences for specialty.

CONCLUSION AND RECOMMENDATIONS

The following factors influence the choice of anesthesiology as a top three preferred specialty as a career: personal interest, positive influence during clerkship, income, enough time for leisure activity, and short length of training. As such, to encourage more medical graduates to pursue specialty training in anesthesiology, their clinical rotation in the department should leave a positive and lasting experience for them, including more participation during lectures, exposure in the operating room and during duty hours.

The limitation of this study is that it is a cross-sectional study and also due to the limited number of respondents. A prospective cohort study following a batch of medical students from their first year in medical school up until internship would be better to observe their career preferences through time.

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