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FACTORS INFLUENCING INTERNS AND MEDICAL STUDENTS JOINING SURGICAL RESIDENCY PROGRAM

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ABSTRACT

Introduction: The number of Saudi Surgical trainees has been noted to be in decline. The study aims to assess factors influencing interns and medical students joining the surgical residency program.
Subjects and Methods: This cross-sectional study was conducted among 92 6th year medical students and interns in Tabuk City, Saudi Arabia during the period from September 2019 to February 2020. Participants signed a written informed consent then responded to a structured questionnaire modified from the previous literature and based on demographic data, a twenty (five choices) Likert scale questions, thirty choices, and open-ended questions about influential factors determining future career. The Statistical Package for Social Sciences (SPSS, version 20, New York) was used during the analysis of the collected data.
Results: There were 92 students and interns, mean age (24.01±2.27 years), 45.7% were interested in joining a surgery residency program. The most influential factors were interest in the field (3.95±1.37 out of 5), prestige (3.89±1.27), and career opportunity (3.64±1.20); Interns were more concerned about income and career opportunities, while future income, the ability to obtain a residency program, and intellectual challenges are more influential factors among males, P-<0.05.
Conclusion: Nearly half of participants are willing to join surgery with interest in the field, prestige, and career opportunity being the most influential factors. Senior men were more concerned about future income, the ability to obtain a residency program, and intellectual challenges.

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Introduction

A surgical career is challenging, as it needs both knowledge and psychomotor skills. The influential factors in selecting a residency program varied considerably across countries. A recent review of the literature concluded that real and perceived gender discrimination has deterred female medical students from entering surgical careers. Additionally, limited exposure to surgery during medical school and differences between student and surgeon personality traits and values may deter students from entering a surgical career. [1]

However, the rapid advancement in technology including new inventions and Robotic Surgery presents a substantial change. [2-4] A personal experience might be the beginning of the road to success (Dr. Montgomery, who was interested in veterinary medicine and graduated in science, followed by learning Medicine. Montgomery graduated with many honors; he and transplant administrator, Brigitte Sullivan, later transformed a transplant program into a transplant institute. [5] The story began when experiencing his father suffering from heart failure and refuting a cardiac transplant. Novic et al. [6] noted that surgeons are repeatedly discussing this important issue while maintaining their traditional roles.

A previous study showed that the driving forces for interest in a plastic surgery career among residents and students involved the complexity of the field, variety of career choice, enjoyable rotations, and future lifestyle. [7] Moreover, novelty seeking and self-transcendence had been shown to affect academic achievement and specialty choice. A study published in Egypt showed that males were significantly predominating surgical specialties except for obstetrics and gynecology; higher reward dependence, persistence, and cooperativeness were observed among those who preferred patient-centered specialties; highest harm avoidance was shown among pathology choosers and the reverse was concluded in radiology. [8] Therefore, surgery as a practice may be losing its dominance as observed by Schreiter et al. [9] in Germany.

Thus, personality may be a parameter in defining the selection and mentoring of candidates. [10]

There is literature scarce regarding the declining rates and barriers to joining surgery as a future career. Importantly, a substantial variation was noted. A declining rate or lack of interest was observed in Asia, [11-14] Europe, [15, 16] the United

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States of America, [17-19], and South America. [20] While African countries showed the reverse. [21, 22] A study on the effectiveness of surgery interest group in the preclinical years stated that after establishing the interest group, entrance rates into general surgery programs tripled from baseline. [23]

Methods

Study Type and Population

This is a cross-sectional study conducted among 92 interns and final year medical students at Medical College, at the University of Tabuk, and five central hospitals in the city. The study was conducted from September 2019 to February 2020 to answer the question: What is the reason, if any, behind the low proportion of applicants for a surgical residency program in Saudi Arabia? All students and interns who agreed to participate were included.

Measures

A structured questionnaire modified from the previous literature [12, 19, 20] and approved by a surgeon and a medical education expert was used to collect data.

The basic characteristics/demographics of the participants include (age, intern versus medical students, gender, and preference of surgery or another specialty as two main broad categories)

The second part consisted of 20 questions using a Likert scale, each with five choices (5=Strongly agree, 4=agree, 3=not sure, 2=disagree, 1=strongly disagree). The questions included interest in the field, research and teaching, the impact of role models, family, friends, future income, and fear of infections on their residency choice. The participants were also asked about the effect of career opportunities, the ability to obtain residency position, the length of the training period, call schedules, gender distribution in the specialty, prestige, future patient demographics, lifestyle during residency, academic opportunities, patient relationships/interaction, work hours after residency, lifestyle after training, and the intellectual challenge posed by a surgical career, in addition to choosing the most three influential factors from 30 choices.

Ethical Consideration

The Ethics Committee of the University of Taif, Saudi Arabia approved the research. All the participants signed written informed consent.

Statistical Analysis

The Statistical Package for Social Sciences (SPSS, version 20, Chicago) was used for data analysis, along with the Chi-square, independent sample t-test, and logistic regression analysis. The data were presented as percentages and mean± SD, a P-value of <0.05 was considered significant.

Results:

There were 44 students and 48 interns whose response rate was 70% and mean age 24.01±2.27 years. Male dominance was obvious (76.1% vs. 23.9%) and 45.7% of participants were interested in joining a surgery residency program. Table 1.

The most preferred specialty was medicine (28.3%), followed by surgery (20.6%), pediatrics (9.8%), and radiology (6.5%). Furthermore, quality of life (66.3%), (15.5%), private practice (9.8%), and intellectual challenges (5.4%) were the most chosen options for open-ended questions. Table 2.

The most influential factor for choosing the residency program was interest in the field (3.95±1.37 out of 5), followed by prestige (3.89±1.27), and career opportunity (3.64±1.20). Table 3.

Based on a comparison of the students and interns, a high future income and career opportunities were observed to be more influential among interns compared to their counterparts with significant statistical differences (3.72±1.12 vs. 3.06±1.37, and 3.89±1.17 vs. 3.36±1.180, P-values (0.013, and 0.0330), 95% *CI,* (-1.17.14), and (-1.02, 0.04) respectively. No significant statistical differences were evident between interns and students regarding other factors. Table 4.

In the current survey, males considered future income (3.65±1.21vs. 2.63±1.21, P-value, 0.001, 95% *CI,* 0.43-1.61), the ability to obtain a residency program (3.54±1.30 vs. 2.68±1.42, P-value, 0.010, 95% *CI,* 0.21-1.50), and intellectual challenges (3.52±1.12 vs. 2.90±1.01, P-value, 0.024, 95% *CI,* 0.08-1.15) more than women with significant statistical differences. No differences were observed regarding other factors. Table 5 illustrates a comparison between males and females.

In the current data, no significant was evident between women and men regarding the choice of a Surgery residency program. Figure 1.

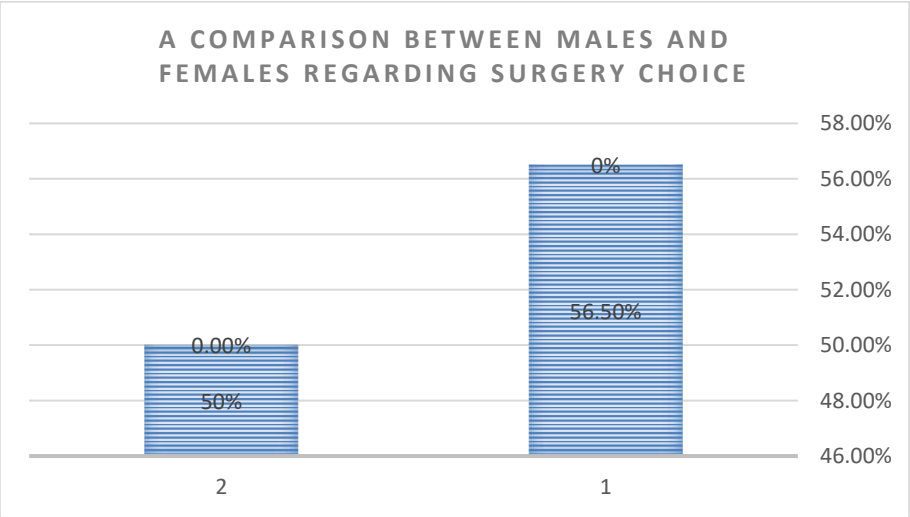

Figure 1: A comparison between Males and Females regarding the Choice of a Surgical Residency Program (P-value, 0.639)

Table 1: Character and the Preferred Specialty of Interns and Medical Students

Character	No %
Age	24.01±2.27
Intern Students	48 (52.2%) 44 (47.8%)
Sex Females Males	 22 (23.9%) 70 (76.1%)
Interested in Doing Surgery	42 (45.7%)

Table 2: The Most Preferred Specialty and the Most Influential Factors on a Residency Program Selection (Open-ended Questions Responses)

Character	%
The Most Preferred Specialty Medicine Surgery Pediatrics	 28.3% 20.6% 9.8%
Open-ended Questions Responses Quality of Life Interesting Patients Intellectual Challenge	 66.3% 15.5% 5.4%

Table 3: The Top Three Most Influential Factors regarding their Residency Program Choice

Factor	Mean± SD
Interest in the Field	3.95±1.37
Prestige	3.89±1.27
Career Opportunities	3.64±1.20

Table 4: A Comparison between Interns and Students regarding the Influential Factors on a Residency Program Selection

Factor	Interns	Students	P-value
Interest in the Field	4.02±1.39	3.88±1.36	0.642
Interest in Research	3.25±1.18	3.08±1.41	0.543
Role Model	3.09±1.19	3.18±1.36	0.720
Family Expectations	2.93±1.37	3.06±1.40	0.653
Advice from a Friend	2.50±1.32	2.65±1.42	0.580
A high Future Income	3.72±1.12	3.06±1.37	0.013
Hazards of Infections	2.41±1.31	2.70±1.37	0.308
Career Opportunities	3.89±1.17	3.36±1.18	0.033

Ability to Obtain a Residency Program	3.50±1.36	3.15±1.37	0.238
Length of Training	3.12±1.33	2.79±1.19	0.216
Call Schedule	3.12±1.55	3.29±1.28	0.570
Gender Distribution	2.33±1.43	2.75±1.38	0.160
Prestige	2.72±1.42	3.06±1.50	0.269
Future Patient Demographics	3.08±1.33	3.34±1.36	0.362
Lifestyles during Program	3.35±1.50	3.09±1.53	0.410
Academic Opportunities	3.08±1.21	2.90±117	0.488
Patient Relationship	3.39±1.31	3.40±1.29	0.960
Working Hours after Residency	3.66±1.34	3.61±1.21	0848
Lifestyles after Training	3.95±1.20	3.81±1.20	0.600
Intellectual Challenges	3.58±1.04	3.15±1.118	0.071

*One-way Sample T-TEST

Table 5: A Comparison between Women and Men regarding the Influential Factors on a Residency Program Selection

Factor	Males	Females	P-value
Interest in the Field	4.04±1.30	3.68±1.58	0.285
Interest in Research	3.14±1.34	3.22±1.19	0.739
Role Model	3.20±1.34	2.95±1.04	0.436
Family Expectations	3.10±1.39	2.68±1.32	0.218
Advice from a Friend	2.55±1.32	2.63±1.21	0.814
A high Future Income	3.65±1.21	2.63±1.21	0.001
Hazards of Infections	2.52±1.41	2.63±1.13	0.745
Career opportunities	3.75±1.22	3.27±1.07	0.099
Ability to Obtain Residency Program	3.54±1.30	2.68±1.42	0.010
Length of Training	3.01±1.30	2.81±1.18	0.531
Call Schedule	3.21±1.49	3.18±1.22	0.926
Gender Distribution	2.47±1.46	2.72±1.27	0.463
Prestige	3.01±1.49	2.50±1.30	0.152
Future Patient Demographics	3.20±1.37	3.22±1.26	0.935
Lifestyles During Program	3.37±1.49	2.77±1.54	0.107
Academic Opportunities	3.08±1.23	2.72±103	0.222
Patient Relationship	3.54±1.24	2.95±1.39	0.064
Working Hours after Residency	3.74±1.27	3.31±1.42	0188
Lifestyles after Training	3.95±1.18	3.68±1.52	0.378
Intellectual Challenge	3.52±1.12	2.90±1.01	0.024
Age	24.26±1.96	22.95±2.90	0.020

*One-way Sample T-TEST

Discussion

Medical students' choice of specialty is a major determinant of the future physician workforce. Therefore, an insight into how the junior staff selects their future specialty is essential to avoid shortage among different specialties. Accordingly, effective and adequate service depends on the availability of a sufficient number of residents in all the specialties according to local needs. The current findings will serve as baseline information in our region for future interventions.

The influential factors noted in selecting residency programs were interest in the field, prestige, future patient demographics, career opportunities, lifestyles during residency, and a high future income in decreasing order of priority. The current findings are similar to Chen et al.'s study, [11] which found that personal interest, workload and stress, and career-oriented lifestyle are the most influential. Moreover, a study among medical students and junior doctors in Ireland found that career opportunities and prestige are more influential in line with the current observation. [24] Another survey showed that the top factors indicated by students are interest in the field and the work-life balance supporting the current observations. [25] Lifestyle during the residency program plays a significant role in choice in line with Reed et al., [26] who reported that

balancing work and personal life are among the factors most affecting surgery program choice. In the present study, family and friends had a lower influence in choosing specialty; Avidan et al. [27] reported similar findings.

A study conducted in East California [28] found that career preference and income are increasingly influenced by a career choice among medical students and were following the current data. In the present study, 47.5% of students and interns were interested in joining a surgery residency program; the current findings reported being higher in the aforementioned than studies conducted among medical students in Sudan, Ireland, Canada, Riyadh, Saudi Arabia, and Nigeria. [20, 29-32] The present findings are similar to a study conducted in Pakistan [14] and found that 48.2% of students reported a desire to peruse a surgical career in the future. A declining career in general surgery and its subspecialties was observed recently in the USA, Canada, and Europe attributed to a growing interest in controllable lifestyles and selecting candidates to join the primary healthcare system. Additionally, income, prestige, job opportunities, and career satisfaction were among other important factors. [33]

No significant difference was found between women and men regarding surgery residency programs; a plausible explanation could be that the norms for gender equality are strong in the KSA. Our findings are similar to a study conducted in Sweden, reporting no differences across gender in joining various specialties including surgery. [34] Other studies reported a trend towards females entering specialties dominated by males. However, fewer females finished their specialty training in surgery, the barriers of which could be lack of social support and masculine homosociality that may be only apparent after entering the residency program. Our findings of a lower impact of future income and career opportunities on career choice among medical students compared to interns may be explained by the fact that most students were female and showing less interest in salaries and career opportunities compared to their male counterparts.

The present findings of male preference for future income and career opportunities are in line with previous studies from Switzerland, Canada, the USA, and France. [35-38]

The study limitations were the relatively small size of the study sample, the reliance on a self-administered questionnaire, and the fact that the study was conducted at a single university. Therefore, generalization for the entire country cannot be ensured.

Conclusions:

Nearly half of the medical students and interns were interested in joining a residency program in surgery with surgery prioritized as the second choice only after internal medicine. The majority of factors influencing their choice interested in the field, prestige, career opportunities, and future patient characteristics. Furthermore, family and friends were less influential. The strong norm for gender equality observed in the Kingdom of Saudi Arabia is mirrored by nearly equal numbers of women and men joining non-lifestyle specialties. No differences were observed between males and females regarding the factors that may influence the choice of a residency program except for future income, intellectual issues, and the ability to obtain a residency program. Larger multicenter studies are needed elaborating on the barriers to join a specific specialty and compare different universities including private colleges. Furthermore, assessing barriers in completing a residency program in surgery can explain the shortage of surgeons and comparing the different sub-specialties. The community and stakeholders' attitudes towards gender preference regarding surgery should also be considered.

Conflicts of Interest:

The author declares no conflict of interest.

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Availability of Data:

All the data presented in this manuscript are available on request.

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