

Factors impacting anesthesiology residents in Saudi Arabia when they are planning their future

ABSTRACT

Purpose: This study is undertaken to examine the factors that influence Saudi Board anesthesia residents' preferences in terms of future practice location, fellowship training, and research.

Methods: A cross-sectional study was conducted. Data on fellowship training, research, and future practice location preferences, as well as demographics, were collected using surveys distributed to all anesthesia residents enrolled at Saudi anesthesiology residency program ($N = 302$).

Results: A total of 117 residents (38.7%) responded to the survey. Of those 88.5% of residents planned on further subspecializing. The most highly sought fellowships were acute and chronic pain, regional anesthesia, simulation, and pediatric anesthesia. Residents pursuing fellowship training were mostly affected by personal interest, improving employment prospects, and future income. Only 11.5% of residents intended to incorporate research into their next practice—personal interest, employability, and lifestyle were the most influential in their decision.

Conclusion: Most anesthesia residents training in Saudi Arabia choose to pursue fellowship training. However, less than one-fifth have an interest in incorporating research into their future careers.

Key words: Anesthesia residents; future career; Saudi Arabia

Introduction


During the years of residency training, residents are faced with a plethora of critical decisions to ponder, namely whether it be further subspecializing by enrolling in a fellowship program; or to pursue a career in academia; and the whereabouts of their future practice among other pivotal future decisions. The determinant factors spring from a range of individual personal and professional goals and needs.

Understanding how the factors are involved in a resident's mind is vital to the planning of the residency program and the development of the curriculum.^[1] Harris *et al.* found out that role models, lifestyle issues, and opportunities for teaching were the most critical factors in making decisions for pediatric residents.^[2] In considering the pursuit of subspecialty training, income potential, a scope of practice, and personal factors,

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such as family time, are the most critical factors that affect internal medicine residents.^[3] Lifestyle factors and personal debt influence general surgery residents, whereas desire to acquire specialized skills and prestige affect ophthalmology residents more.^[4] Factors that influence career decision-making are multiple, and each specialty has its unique set of considerations in career planning. In the anesthesia resident population of Saudi Arabia, such career altering factors are yet to be adequately examined. Further, data suggest that only a few anesthesia residents go for an academic career.^[5,6] Taking a closer look at how anesthesia residents of Saudi Arabia plan their career will aid in determining the status and shed light on possible factors that may affect their decision to go into research.

This study aims to identify the preferences of anesthesia residents training in Saudi Arabia in subspecialty fellowship training, research, and future practice location and to delineate the factors that influence those preferences.

Methods

A 10-item questionnaire (available through an online link) was adapted, with some modifications, from a published article after obtaining the approval from its author.^[1] It was designed to assess: (1) the demographic data; (2) desire to go for fellowship, subspecialty type, and factors affecting; (3) desire to go for research in future and factors affecting; and (4) choices of practice location in future and influential factors. The target population of the survey was residents training in Saudi anesthesiology residency program. We generated survey item based on factors influential in resident career decision-making identified in the literature.^[2,4,7-9] We obtained research ethics approval from King Abdullah International Medical Research Center (KAIMRC). We contacted all anesthesia residents (postgraduates from 1st to 5th year) and those currently enrolled in Saudi anesthesiology residency program through emails. We sent them details including the study nature, purpose, study and goals, details about consent, study confidentiality, and a link to the online electronic survey hosted by SurveyMonkey.com. Consent was implied when residents voluntarily accessed the online survey link. All data were secured online and password protected, and only the first author downloaded the data from the online survey tool.

Statistical analysis

Data responses were summarized using mean (SD) for continuous variables and frequency (percentage) for nominal variables. The survey response rate was calculated using the number of responses divided by the total number of anesthesia residents in Saudi Arabia. On the basis of numbers reported by the Saudi Commission for Health Specialties and with

confirmation from contacting the program director, there were 302 anesthesiology residents registered at Saudi anesthesiology residency program. Association with the dichotomous outcomes of wanting to pursue fellowship training or future research was assessed using a multivariable logistic regression model. Independent variables in the model included demographic information (age, gender, medical school, and postgraduate status). Statistical analyses were conducted using SPSS. All tests used an $\alpha = 0.05$ level of significance.

Results

A total of 117 residents participated; of which 81 (69.23%) were males, and 36 (30.77%) were females. Of the participants, 80 residents (68.38%) were <30 years of age, and 37 (31.62%) were more than 30 years old. A total of 101 residents (86.32%) have had their medical school in Saudi Arabia, and 16 (13.68%) had their medical school outside Saudi Arabia; 94 participants (80.34%) have obtained their boards, while 23 of them (19.66%) are still in training [Table 1].

A total of 100 participants (88.5%) intended to pursue fellowship, whereas 11.5% intended to pursue future research. Only 20 residents intended to practice inside Saudi Arabia in the future. Most of the residents, 79 (67.52%), have intentions to practice in North America in the future, while 15.38% have intentions to practice in other locations. The summary of location preferences and future is given in Table 2.

Moreover, 68% of residents pursuing fellowships are young less than 30 years old and 72% are males. Also 53.85% of those pursuing future research are males. However, correlation of age and gender to pursuing fellowship or research showed no significant difference. Similarly, 85% of those pursuing fellowships and 92.31% of those pursuing future research had their medical school in Kingdom of Saudi Arabia (KSA) and most of them have already obtained their board. Moreover, still correlation of medical school and level of education

Table 1: Demographic data of residents

	Number (%)
Age	
<30 years	80 (68.38)
More than 30 years	37 (31.62)
Gender	
Males	81 (69.23)
Females	36 (30.77)
Medical school	
KSA	101 (86.32)
Outside KSA	16 (13.68)
Level of education	
Board obtained	94 (80.34)
Still in training	23 (19.66)

Table 2: Number of Residents Pursuing fellowship or research and location of future practice

	Number (%)
Residents pursuing fellowship	100 (88.5)
Residents pursuing future research	13 (11.5)
Location of future practice inside KSA	20 (17.09)
Location of future practice in North America	79 (67.52)
Location of future practice in others	18 (15.38)

Table 3: Correlation of independent variables age, gender, medical school, postgraduate status to those pursuing fellowship or future research

	Pursuing fellowship	Pursuing future research	P
Age			
< 30 years	68%	61.54%	0.64
More than 30 years	32%	38.46%	
Gender			
Males	72%	53.85%	0.179
Females	28%	46.15%	
Medical school			
KSA	85%	92.31%	0.477
Outside KSA	15%	7.69	
Level of education			
Board obtained	82	92.31	0.34
Still in training	18	7.69	

to pursuing fellowship or research showed no significant difference [Table 3].

The findings show that 90% of those planning to work in KSA in the future, and 67.09% of those choosing North America as a future location are males; however, it was not statistically significant (with *P* value 0.05); 65% of those planning to work in KSA in the future and 70.89% of those choosing North America as a future location is <30 years old; 90% of those planning to work in KSA in future and 84.81% of those choosing North America as a future location have studied medicine in KSA; 85% of those planning to work in KSA in the future and 78.48% of those choosing North America as a future location have already obtained their board, while 15 and 21.52% are still in training [Table 4 and Figure 1].

Regional anesthesia (20.5%), acute or chronic pain (20.5%), simulation (11.97%), and pediatric anesthesia (11.97%) were the most common anesthesia fellowships that residents planned to pursue or to which they had submitted applications [Table 5 and Figure 2].

Among those deciding to pursue fellowship training, personal interest (94%), enhancing employability (91%), and income potential (87%) were the most common factors influencing this decision [Table 6 and Figure 3].

Table 4: Correlation of independent variables age, gender, medical school, postgraduate status to the choice of future location

	KSA	North America	Others	P
Age				
<30	65	70.89	61.11	0.67
Above 30	35	29.11	38.89	
Gender				
Males	90	67.09	55.56	0.05
Females	10	32.9	44.44	
Medical school				
KSA	90	84.81	88.89	0.78
Outside KSA	10	15.19	11.11	
Postgraduate status				
Board obtained	85	78.48	83.33	0.75
In training	15	21.52	16.67	

Table 5: Anesthesia fellowship training programs that anesthesia residents plan to pursue

Anesthesia fellowship programs	Number (%)	Males pursuing fellowship number (%)	Females pursuing fellowship number (%)
Acute or chronic pain	24 (20.51)	16 (20)	8 (22)
Regional	24 (20.51)	14 (17)	10 (28)
Simulation	14 (11.97)	7 (9)	7 (19)
Pediatric	14 (11.97)	10 (12)	4 (11)
Cardiac anesthesia	11 (9.4)	10 (12)	1 (3)
Intensive care	10 (8.55)	10 (12)	0
Thoracic	6 (5.13)	5 (6)	1 (3)
Neuro-anesthesia	4 (3.42)	3 (4)	1 (3)
Obstetrics	3 (2.56)	3 (4)	0
Research fellowship	3 (2.56)	1 (1)	2 (6)
Transplant	2 (1.71)	2 (2)	0
Airway	2 (1.71)	0	2 (6)

Moreover, among those deciding to pursue research after residency, personal interest (100%), enhancing employability (84.62%), and lifestyle (84.62%) were the most common factors influencing this decision [Table 7 and Figure 4].

Although the city or town of practice was the most influential factor (93.16%) in resident's preference for future location overall and those pursuing fellowship (92%) and future research (100%), peers had the least significant effect (65.8%) over all of them. Income potential was the second most influential factor in all respondents (89.7%) and for those pursuing fellowship (91%). Lifestyle was the third influential factor in all respondents (89.7%) and for those pursuing fellowship (89%), but it was the second most influential factor for those pursuing research (92.3%) [Table 8 and Figure 5].

In the logistic regression model, only male sex (adjusted odds ratio [aOR] 5.07; 95% confidence interval [CI]: 1.06–24.14; *P* = 0.04) was associated with wanting to practice inside KSA in the future. The odds of choosing KSA for future

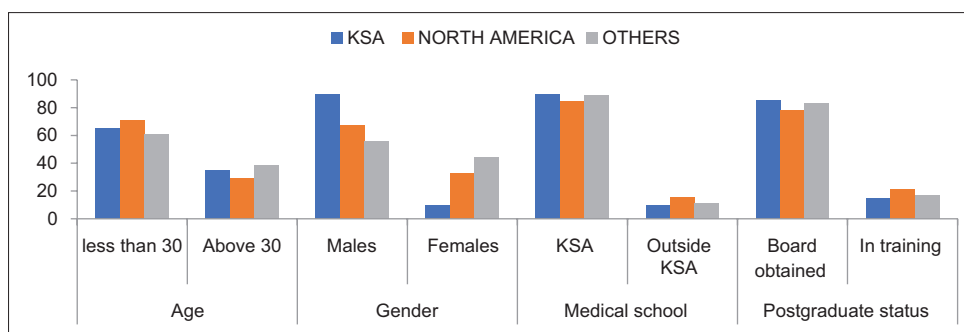


Figure 1: Correlation of independent variables: age, gender, medical school, postgraduate status to the choice of future location

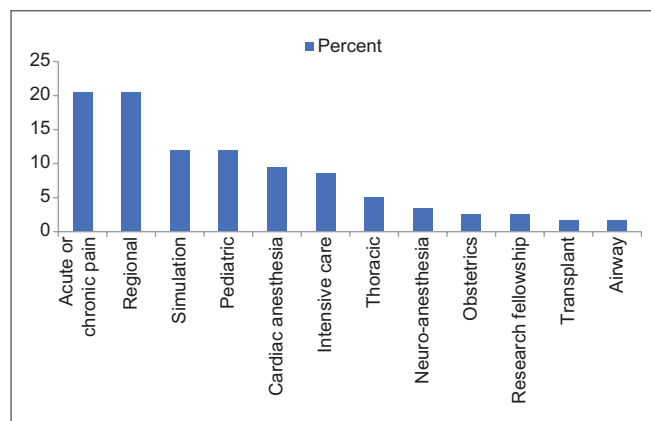


Figure 2: Anesthesia fellowship training programs that anesthesia residents plan to pursue

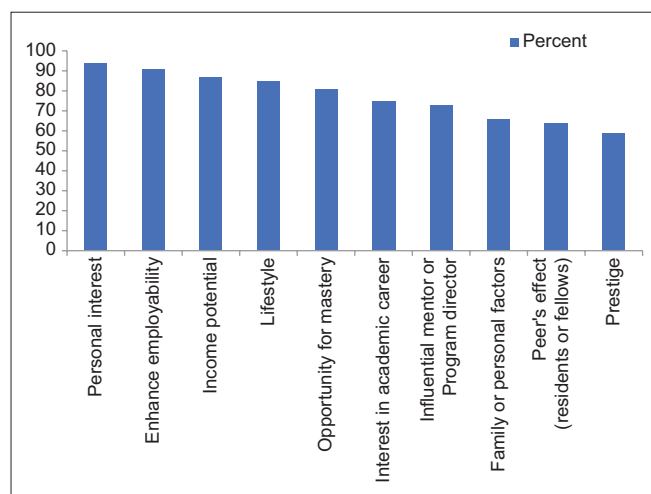


Figure 3: Influential factors for residents who decided to pursue fellowship training

practice location for males is five times the odds ratios for females [Table 9].

Discussion

The present study determined the preferences of Saudi anesthesia residents training inside and outside the KSA for fellowship, research, and future practice location and

Table 6: Influential factors for residents who decided to pursue fellowship training

Influential factors	Percentage
Personal interest	94
Enhance employability	91
Income potential	87
Lifestyle	85
Opportunity for mastery	81
Interest in academic career	75
Influential mentor or program director	73
Family or personal factors	66
Peer's effect (residents or fellows)	64
Prestige	59

Table 7: Influential factors for residents who decided to pursue research after residency

Influential factors	Percentage
Interest	100
Employability	84.62
Lifestyle	84.62
Lack of experience	69.23
Income potential	69.23
Peer's effect	61.54
Family or personal reasons	53.85

identified the factors that influence those preferences. A total of 117 residents (38.7%) out of 302 anesthesia residents enrolled at Saudi anesthesiology residency program responded to the survey.

The data gathered demonstrated that the majority (88.5%) of the anesthesia residents are interested in pursuing fellowship training. This has also been reported among general surgery residents,^[10] radiology residents,^[11] and anesthesia residents elsewhere.^[12] However, only 11.5% tended to pursue research in their plans. It was also found that males desire to continue fellowship training (72%) and exceeded females (28%). Many factors were seen in the literature that hinders female students from pursuing their fellowship training. Among those were work stresses,^[13] poor control over work environment,^[14] and family-related concerns.^[15] In contrast, Warner *et al.* show that females were more likely to pursue

Table 8: Factors influencing resident’s preference for future location

	City or town of practice	Family or personal reasons	Lifestyle	Teaching opportunities	Peer’s effect	Income potential	Research opportunities
All respondents	93.16	86.32	89.74	84.62	65.81	89.74	76.07
Those pursuing fellowship	92	87	89	83	64	91	74
Those pursuing future research	100	76.8	92.3	92.3	69.23	76.92	84.62

Table 9: Adjusted odds ratios for factors included in multivariable logistic regression model

Variable	Pursuing fellowship Adjusted odds ratio (95% CI)	P	Future practice location inside KSA Adjusted odds ratio (95% CI)	P
Age (below vs above 30)	2.43 (0.6-9.86)	0.21	1.13 (0.37-3.42)	0.816
Sex (Male vs Female)	3.14 (0.81-12)	0.095	5.07 (1.06-24.14)*	0.0413
Medical School (outside vs inside KSA)	2.84 (0.32-24.9)	0.345	0.69 (0.13-3.62)	0.66

*Statistically significant. CI=Confidence interval

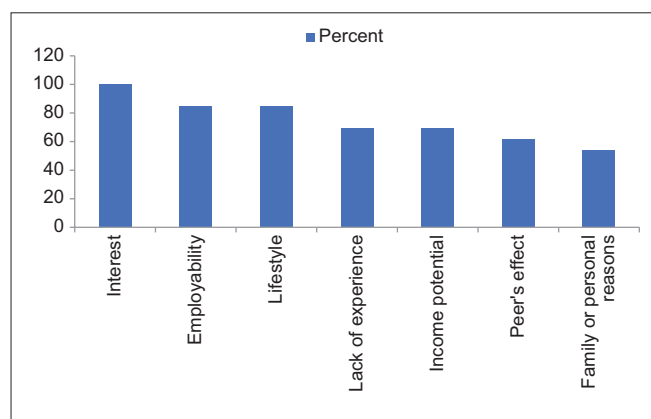


Figure 4: Influential factors for residents who decided to pursue research after residency

advanced fellowship training than males who were more likely to enter private practice positions.^[16]

An interesting finding was that both fellowship and research pursuers share the top two influential factors that shape their future career plans. At the forefront was personal interest, which was also seen among Saudi medical students and interns.^[17,18] However, it is believed that attention is not perpetual and could change later in life while the person is exposed to different factors, such as experiences and environmental factors. Enhancing employability was the second most common factor for those desiring to pursue fellowship training and research after residency. Several studies show that acquiring more experience will increase the chance of employability. A study by Dale *et al.* shows that general practice specialists experienced enhanced employability when completing a one-year fellowship program.^[19] Furthermore, fellowship-trained physicians are attracted to an institution, as their subspecialty knowledge can be shared with other faculty members and residents, and they can further expand an already existing subspecialty program.^[12] It was noted that academic productivity of anesthesiologist is much less when compared to other

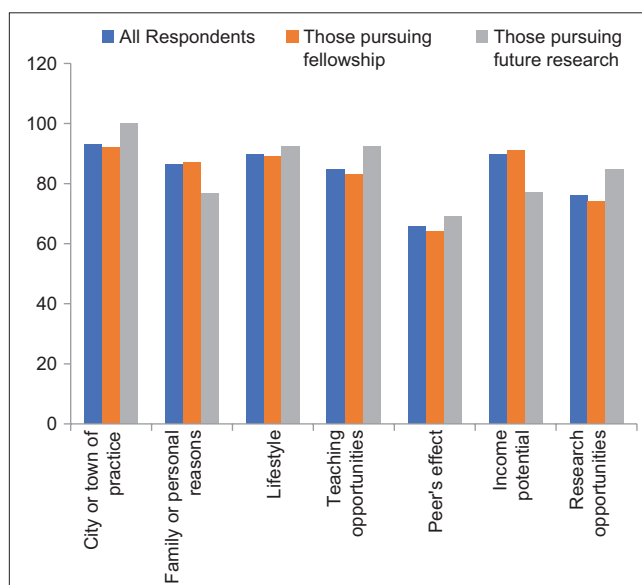


Figure 5: Factors influencing resident’s preference for future location

disciplines. This situation may provide a competitive advantage for anesthesia residents interested in research.^[20]

The four most popular anesthesia subspecialties were acute or chronic pain, regional, simulation, and pediatric. Dedicated acute pain and regional anesthesia services are invaluable in improving acute pain management, which in turn has the potential to improve medical outcomes, enhance patient satisfaction, and reduce costs. Thus, healthcare providers will be encouraged to recruit anesthesiologists trained in such subspecialty.^[21] Furthermore, a study by O’Leary and Crawford indicated that subspecialty areas most frequently perceived to require improved training included pediatric cardiac anesthesia, chronic pain medicine, and regional anesthesia.^[22] Despite that many studies point out the preference of patients and surgeon for regional anesthetic option,^[23] this is not the case seen in Saudi patients (personal communication). An Australian study shows that more patients, especially females, may accept regional anesthesia if reassured appropriately about not hearing

or seeing the surgery. Once patients have experienced regional anesthesia, they are more likely to choose it in future.^[24]

Most respondents indicated that they prefer to practice outside of Saudi Arabia, specifically in Canada. Interestingly, the logistic regression analysis revealed that only male sex is associated with choosing Saudi Arabia for future practice location. Several factors influence the resident's preference for the next place; among that, the city of practice and lifestyle were prioritized for both fellowship and research pursuers while peers had the least effect. Teaching and research opportunities were the main influential factors for residents pursuing future research, whereas income potential scores second influential factor for residents seeking fellowship. These findings point out that personal interests have an essential role in the career plans of Saudi anesthesia residents.

There are several limitations to the current study. First, the data collected for this investigation may not be representative of all Saudi anesthesia residents since the response rate was only 38.7%, and more than half of the residents were not captured. Second, the number of residents pursuing research was minimal which does not allow any definite conclusions. Third, the subspecialties provided for anesthesia residents inside the Kingdom are limited to pediatric, pain, and cardiac. Thus, the higher number of residents who chose to practice outside may be due to the lack of other subspecialties programs rather than their actual preferences. Fourth, we did not include any contribution of social factors to the result of your study especially for female resident. Fifth, those who got their board, they are not good candidates for our questionnaire; in particular, they had already made their decision about their future career. Finally, the results of our study cannot be generalized as the number of females is limited. In conclusion, the overall findings can be utilized to improve the residency program curriculum and planning the methods of selection which can be of help in addressing the job market needs of the kingdom.

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Conflicts of interest

There are no conflicts of interest.

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