

Factors that Influence Orthopedic Surgeons When Choosing Their Subspecialty in Saudi Arabia

Khalid A. Bakarman, Kholoud O. Al Zain, Nawaf A. Alotaibi, Ahmed A. Aldakhil, Abdullatif M. Alhassan

Department of Orthopedic, College of Medicine, King Khalid University Hospital, King Saud University Medical City, Riyadh, Saudi Arabia

ABSTRACT

Objectives: The objectives of this study were to highlight the factors that influence orthopedic trainees in Saudi Arabia to choose their subspecialties and to determine the most desired residents' subspecialty and the percentage of residents who are planning to pursue a fellowship program. **Methods:** We formatted an online questionnaire using a Likert-type scale. The survey contained 21 questions. The study was conducted in multiple cities in Saudi Arabia. The survey was distributed to orthopedic surgeons. We used WhatsApp Messenger, which is the most popular texting application in Saudi Arabia and the most guaranteed method to ensure that more participants would answer the survey. The survey was closed after 4 weeks for data analysis. **Results:** The number of surgeons included in this study was 108 out of 175 contacted, including residents, fellows, and consultants. Overall, personal interest in a specialty and a patient's prognosis were the most influential factors that motivated surgeons to choose their careers, while lack of competition was the least important factor. For the 37 (90.2%) residents who chose to continue their training, pediatric orthopedics (26.8%) and foot and ankle surgery (14.6%) were the most desired subspecialties whereas sports medicine (7.3%) and oncology (0%) were the least. The female doctors represented 5.6% among orthopedic surgeons included in our study. **Conclusion:** Orthopedic residents must be guided to the subspecialties needed in their communities as the fact that general orthopedics is disappearing very soon from clinical practice in tertiary care hospitals in big cities of Saudi Arabia.

Keywords: Career choice, fellowships and scholarships, female, orthopedic surgeons, Saudi Arabia, specialization

INTRODUCTION

The pursuit of orthopedic fellowship in Saudi Arabia has become increasingly popular over the past several years. Because of the rapidly transforming health-care system toward subspecialization, the residents appear to have different critical factors to remember when choosing their careers. Most orthopedic surgery residents elect to continue their training; however, many factors may affect their choice, and these factors are not adequately recognized.^[1]

Nowadays, joining a fellowship program in Saudi Arabia has become more difficult. There is a significant increase in the number of medical graduate students since 1999, as we have now more than 25 medical schools compared to only four medical schools then. At the same time, we have limited seats in the only three main orthopedic training programs in Saudi Arabia.^[2-4]

Like many other surgical specialties, orthopedics has increasingly trended toward subspecialization.^[5] There are

many factors, including market pressure, the pursuit of scholastic purposes, improvement of surgical and clinical experience, excellence outcome and lifestyle considerations, colleagues' advice, and institutional requests, that increase the proportion of orthopedic surgeons to continue their postgraduate training.^[1,6]

Gender imbalance is present in orthopedic surgery like other surgical specialties.^[7,8] Significant gender preference toward orthopedic surgery was observed among the male medical

Address for correspondence: Dr. Khalid A. Bakarman, Department of Orthopedic (49), College of Medicine, King Khalid University Hospital, King Saud University Medical City, P.O. Box 7805, Riyadh 11472, Saudi Arabia.
E-mail: kbakarman@yahoo.com

Received : 20-09-2018

Revised : 11-10-2018

Accepted : 26-11-2018

Published Online : 11-12-2018

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

How to cite this article: Bakarman KA, Al Zain KO, Alotaibi NA, Aldakhil AA, Alhassan AM. Factors that influence orthopedic surgeons when choosing their subspecialty in Saudi Arabia. *J Musculoskelet Surg Res* 2019;3:216-20.

Access this article online

Quick Response Code:



Website:
www.journalmsr.com

DOI:
10.4103/jmsr.jmsr_56_18

students.^[9] According to the data of the Saudi Commission for Health Specialties, there were no females in orthopedic surgery in Saudi Arabia until 1997. However, it is changing recently as many females started joining the specialty.

The goals of our study were to identify the factors that guide orthopedic surgeons to choose their subspecialty and to determine the most desired residents' subspecialty and the percentage of the residents who are planning to join a fellowship program.

MATERIALS AND METHODS

This cross-sectional study was conducted in the Department of Orthopedic, College of Medicine, King Saud University, Riyadh, Saudi Arabia, during the period from October 2017 to April 2018.

We formatted an online questionnaire using a Likert-type scale. The survey consisted of 21 questions, including personal data, level of training, a specialty of interest, and 15 influencing factors. Before distributing the survey, we did a pilot study on convenience samples of 26 orthopedic surgeons at King Khalid University Hospital, and the questionnaire was validated by the investigator support unit at King Saud University.

The study was conducted in multiple cities in Saudi Arabia. We distributed the survey to Saudi orthopedic residents, fellows, and consultants from the database of the Saudi Orthopedic Association and the Residency program of the Saudi Commission for Health Specialties. As the E-mail addresses were not available, we used "WhatsApp Messenger," which is the most popular application for texting in Saudi Arabia and the most guaranteed method for the survey to reach more participants. The survey was closed after 4 weeks for data analysis.

Data were analyzed using the Statistical Package for the Social Sciences (SPSS 22; IBM Corp., New York, NY, USA). The continuous variables were expressed as a mean \pm standard deviation (SD), and the categorical variables were expressed as percentages. The *t*-test and one-way ANOVA were used for continuous variables. $P < 0.05$ was considered statistically significant.

RESULTS

The number of surgeons included in this study was 175 (the number of orthopedic surgeons with contact number in the database of the Saudi Orthopedic Association and the Residency program of the Saudi Commission for Health Specialties), including residents, fellows, and consultants [Table 1]; 108 of 175 surgeons have completed the survey (61.7% response rate). The mean age of the participants was 35 years (SD, 7.8 years). Most of the respondents ($n = 86$, 79.6%) were married. The number of residents in our study was 41, and all of them were Saudi; only 4 (9.8%) chose not to pursue a fellowship program and go into general orthopedic practice, while 37 (90.2%) residents decided to continue their training and pursue a fellowship program.

Table 1: Characteristic of the participants

Training level	n (%)
R1	10 (9.3)
R2	8 (7.4)
R3	6 (5.6)
R4	6 (5.6)
R5	11 (10.2)
Fellow	32 (29.6)
Consultant	35 (32.4)

Our result listed 15 factors that might influence the participants' decisions in choosing a subspecialty [Figure 1]. It was found that the most important influencing factor among our orthopedic surgeons' sample in selecting a subspecialty was a personal interest in the specialty (with an average score of 4.46), followed by treated patient's prognosis (4.34), and the least influential factor was lack of competition (3.16).

We also classified the results for the 15 influencing factors according to the level of the surgeons who participated in the study: residents, fellows, and consultants [Table 2]. The data showed that the overall scores of the influencing factors are significantly different ($P < 0.05$) between the residents, fellows, and consultants. The residents considered a patient's prognosis as the most important factor in choosing a subspecialty, while advice from friends, family, or colleagues was the least important. On the other hand, the fellows and consultants reported that a personal interest in a subspecialty came first when choosing their careers, whereas a lack of competition was the lowest factor affecting their choices.

According to the residents, the subspecialty with the highest interest to join in the future is pediatric orthopedics (26.8%), followed by foot and ankle surgery (14.6%) and arthroplasty (12.2%), while trauma, upper extremity, and spine (9.8%) were equally selected. Sports and oncology were the least selected specialties (7.3% and 0%, respectively) [Figure 2].

Furthermore, we asked fellows and consultants if they were satisfied in their careers. The satisfaction rate demonstrated that 57% of the surgeons were strongly satisfied [Figure 3]. Furthermore, the results showed that female doctors represent 5.6% among the orthopedic surgeons included in the present study.

DISCUSSION

Nowadays, the trend of subspecialization is increasing.^[5] In this study, 90.2% of the residents stated that they were planning to continue their training and join a fellowship program. Gaskill *et al.*^[10] reported that pursuing a fellowship program in the US became popular in the 1970s, and the percentages of general orthopedics decreased from 44.2% to 28.7% between 1990 and 2006. Another study^[11] concluded that the overall proportion of fellowship applicants from graduating orthopedic residents

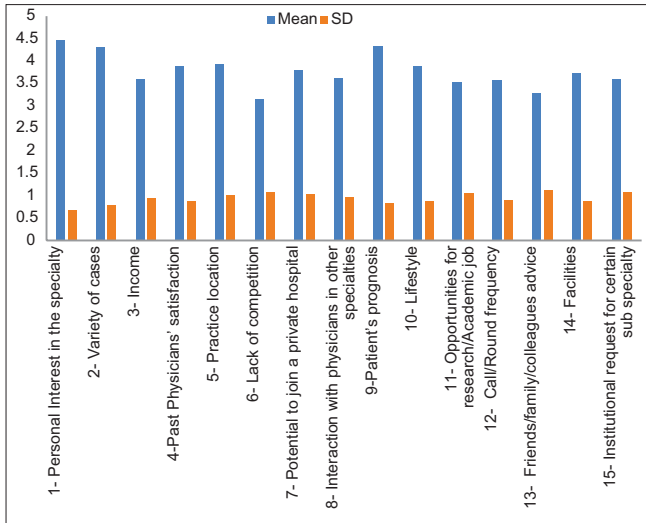


Figure 1: Mean of the score for factors influencing orthopedic surgeon choice of subspecialty fellowship

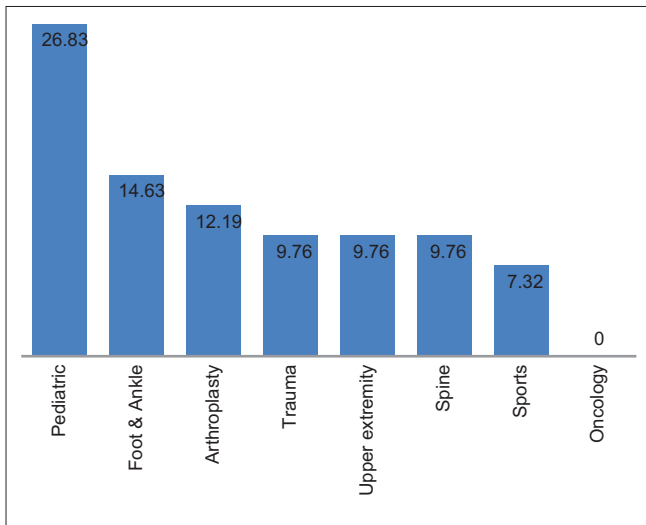


Figure 2: The percentage of desired orthopedic subspecialties selected by residents

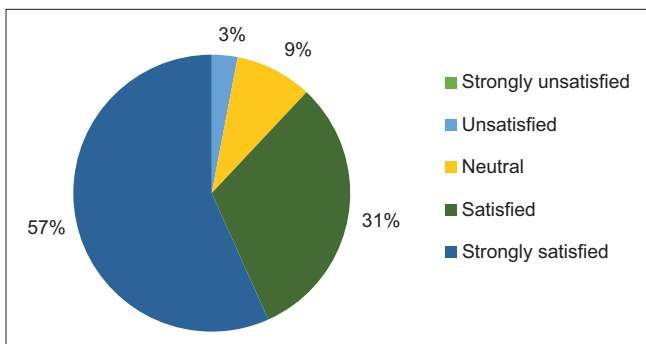


Figure 3: The satisfaction level among fellows and consultants

was 76% in 2003 and increased to 90% in 2013. Furthermore, two studies reported that more than 90% of the residents were planning to enroll in a fellowship program.^[12,13]

Table 2: Mean of the score for influencing factors according to the level of the surgeons: residents, fellows, and consultants

	Mean ± SD			P
	Residents	Fellow	Consultant	
Personal interest in the specialty	4.32±0.67	4.47±0.72	4.60±0.60	0.216
Variety of cases	4.14±0.75	4.38±0.91	4.40±0.74	0.303
Income	3.51±0.96	3.78±0.94	3.49±0.95	0.381
Past physician's satisfaction	3.81±1.10	3.91±0.82	3.91±0.66	0.859
Practice location	3.76±0.98	3.94±1.11	4.11±0.93	0.325
lack of competition	3.05±1.18	3.22±1.01	3.23±1.06	0.748
Potential to join a private hospital	3.57±1.17	3.72±0.92	4.09±0.95	0.096
Interaction with physicians in other specialties	3.32±1.03	3.78±0.87	3.80±0.90	0.057
Patient's prognosis	4.41±0.80	4.25±0.88	4.34±0.84	0.744
Lifestyle	4.00±0.91	3.66±0.75	4.00±0.94	0.186
Opportunities for research/academic job	3.30±1.10	3.47±1.02	3.80±1.02	0.126
Call/round frequency	3.54±0.90	3.59±0.87	3.60±0.98	0.956
Friends/family/colleagues advice	2.86±1.25	3.53±0.98	3.51±1.01	0.016
Facilities	3.43±0.83	3.75±0.95	4.03±0.75	0.014
Institutional request for certain sub specialty	3.30±1.02	3.66±1.00	3.83±1.15	0.101
Overall score (out of 75)	54.32±6.28	57.09±7.86	58.74±8.34	0.045

Likert score: Strongly disagree=1, Disagree=2, Neutral=3, Agree=4, Strongly agree=5, SD: Standard deviation

Our data showed that the influencing factors are significantly different ($P < 0.05$) between residents, fellows, and consultants. Fellows and consultants stated that personal interest in the specialty comes first when choosing their career, whereas the lack of competition was the lowest factor affecting their choice. On the other hand, the residents considered the treated patient's prognosis as the most crucial factor in choosing a subspecialty, whereas friends, family, and colleagues' advice was the least important.

Kavulus *et al.*^[1] reported that intellectually stimulating subspecialty and variety of cases were the highest ranking factors by residents, whereas a residency program with a strong tradition of placing in a particular subspecialty had the lowest average score. Niesen *et al.*^[14] conducted a study where they asked the residents to select from ten listed criteria in order of importance, where surgical experience and autonomy, followed by staff members, were the most important factors and research resources and salary ranked as the least important. Furthermore, a study done on fellows of a foot and ankle subspecialty^[15] showed that the relationship between the consultants at their residency program was the primary catalyst to choose the foot and ankle subspecialty as a career.

Orthopedic surgery is a spectrum of many divisions that extend from general orthopedic to differently specified subspecialties.

The result of our study shows that residents had high interest in pediatrics (26.8%), followed by foot and ankle (14.6%) and arthroplasty (12.2%). However, sports and oncology were ranked as least wanted specialties with the rate of 7.3% and 0%, respectively. With regard to why there is low interest in sports medicine as a subspecialty, it is maybe due to the increased number of surgeons specializing in sports medicine in Saudi Arabia. Moreover, regarding oncology, the unfavorable outcome with high expenses of treatment modalities and the need for a particular setup during treatment of bone tumor cases makes this subspecialty less favorable. On the other hand, Hariri *et al.*^[13] conducted a study on US orthopedic residents and showed a contradicting conclusion that the sports medicine (28%) was the most desired specialty whereas pediatric orthopedics (8%) was one of the least. Furthermore, Kavolus *et al.*'s and Niesen *et al.*'s studies^[1,14] both reported that sports medicine was the most desired specialty whereas oncology was the least.

The same study conducted by Kavolus *et al.*^[1] showed why residents preferred certain specialties over others. The study concluded that those residents who prefer sports medicine are influenced by the outpatient surgery factor and are remiss in conducting research. In contrast, those residents who choose an oncology program are interested in joining the academic practice, whereas altruism and a lack of concern about outpatient surgery influence those residents who prefer pediatric orthopedics.

In our study, the female percentage was 5.6%. A study conducted in four countries of the Gulf Cooperation Council – Saudi Arabia, Bahrain, Oman, and Kuwait – showed that females represent 14.6% in all four countries.^[16] In the USA, females in orthopedic residency program are less in comparison with male residents, where the female residents account for no more than 15%.^[17] However, females who apply for orthopedic fellowships range from 7% to 10% annually. The proportion of the match rate for female applicants (91%–99%) is higher than that of male applicants (79%–86%).^[18] Another study conducted in the USA reported that of 360 orthopedic trainees, 85.5% were male and 14.5% were female.^[1] Furthermore, a significant gender preference for orthopedic surgery is observable among male medical students.^[9]

The limitations of our study are the relatively small sample size (although the survey was short and taking no more than 2–3 min), the time dependency, and the conclusions may change later on.

CONCLUSIONS AND RECOMMENDATIONS

The number of general orthopedic surgeons is reducing with an increasing trend toward subspecialty. Orthopedic residents must be guided to the subspecialties required in their communities as long as they are not averse to these subspecialties. Female doctors should be encouraged to join orthopedic residency programs, and they should be convinced that orthopedics is not a male specialty.

Ethical approval

The study protocol was approved by the Ethical Review Committee of the College of Medicine Research Centre, King Saud University, Riyadh, Saudi Arabia.

Acknowledgments

The authors are thankful to the Investigator Support Unit of Prince Naif Health Research Center at King Saud University for their facilitation in the Statistical analysis.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

Authors contributions

KAB and NAA conceived and designed the study. NAA, AAA, and AMA reviewed the literature, collected, and organized the data. KOA and NAA wrote the initial and final draft of the manuscript. All authors have critically reviewed and approved the final article and are responsible for the content and similarity index of the manuscript.

REFERENCES

- Kavolus JJ, Matson AP, Byrd WA, Brigman BE. Factors influencing orthopedic surgery residents' choice of subspecialty fellowship. *Orthopedics* 2017;40:e820-4.
- Alsaddique AA. Graduate education in surgery in the kingdom of Saudi Arabia. The challenge of growing pains. *Saudi Med J* 2004;25:424-8.
- Bajammal S, Zaini R, Abuznadah W, Al-Rukban M, Aly SM, Boker A, *et al.* The need for national medical licensing examination in Saudi Arabia. *BMC Med Educ* 2008;8:53.
- Alzahrani KH, Bajammal S, Alghamdi AA, Taha W, Ratnapalan S. Postgraduate orthopedic training in Saudi Arabia: A need assessment for change. *J Musculoskelet Surg Res* 2018;2:113-20.
- Sarmiento A. Subspecialization in orthopaedics. Has it been all for the better? *J Bone Joint Surg Am* 2003;85-A: 369-73.
- Strelzow J, Petretta R, Broekhuysse HM. Factors affecting orthopedic residency selection: A cross-sectional survey. *Can J Surg* 2017;60:186-91.
- Baqi S, Albalbeesi A, Iftikhar S, Baig-Ansari N, Alanazi M, Alanazi A, *et al.* Perceptions of gender equality, work environment, support and social issues for women doctors at a university hospital in Riyadh, Kingdom of Saudi Arabia. *PLoS One* 2017;12:e0186896.
- Hannawi S, Al Salmi I. Time to address gender inequalities against female physicians. *Int J Health Plann Manage* 2018;33:532-41.
- Shrestha B, Pokhrel YR, Butterworth K. Determinants of postgraduate students' choices of speciality. *JNMA J Nepal Med Assoc* 2016;54:1-7.
- Gaskill T, Cook C, Nunley J, Mather RC. The financial impact of orthopaedic fellowship training. *J Bone Joint Surg Am* 2009;91:1814-21.
- Horst PK, Choo K, Bharucha N, Vail TP. Graduates of orthopaedic residency training are increasingly subspecialized: A review of the American board of orthopaedic surgery part II database. *J Bone Joint Surg Am* 2015;97:869-75.
- Grabowski G, Walker JW. Orthopaedic fellowship selection criteria: A survey of fellowship directors. *J Bone Joint Surg Am* 2013;95:e154.
- Hariri S, York SC, O'Connor MI, Parsley BS, McCarthy JC. Career plans of current orthopaedic residents with a focus on sex-based and generational differences. *J Bone Joint Surg Am* 2011;93:e16.
- Niesen MC, Wong J, Ebramzadeh E, Sangiorgio S, SooHoo NF, Luck JV, *et al.* Orthopedic surgery fellowships: The effects of interviewing and how residents establish a rank list. *Orthopedics* 2015;38:175-9.
- Schiller JR, DiGiovanni CW. Foot and ankle fellowship training: A national survey of past, present, and prospective fellows. *Foot Ankle Int* 2008;29:34-41.

16. Alshammari AN, Shaq MO, Altayeb MA, Khaja AF, Ghabban KM, Khoshhal KI. Gulf cooperation council female residents in orthopedics: In uences, barriers, and mental pressures: A cross-sectional study. *J Musculoskelet Surg Res* 2018;2:51-6.
17. Huntington WP, Haines N, Patt JC. What factors influence applicants' rankings of orthopaedic surgery residency programs in the national resident matching program? *Clin Orthop Relat Res* 2014;472:2859-66.
18. Cannada LK. Women in orthopaedic fellowships: What is their match rate, and what specialties do they choose? *Clin Orthop Relat Res* 2016;474:1957-61.