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Research Article

Factors Influencing the Choice of Orthopedic Specialty among Interns and Last Year Medical Students in Saudi Arabia

Mohammad Alsaleem[1], Adia Almutairi[2]*, Abdullah Alkhars[2], Arwa AlOnayzan[2], Riyad Almasaud[3], Ali Al Khalaf[2] and Abdulwahab Aladhyani[4]

[1]*King Fahad Hospital, Saudi Arabia*

[2]*College of Medicine, King Faisal University, Saudi Arabia*

[3]*Sattam Bin Abdulaziz University, Saudi Arabia*

[4]*Shaqra University, Saudi Arabia*

***Corresponding Author:** Adia Almutairi, College of Medicine, King Faisal University, Saudi Arabia.

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Abstract

Objective: To investigate the factors influencing the choice of an orthopedic career among last year medical students and interns in Saudi Arabia, to guide them to improve their choice, and avoid risks of burning out in undesired residency or wrong life career.

Methods: A cross-sectional study was conducted in Saudi Arabia between August 2020 to October 2020. The final questionnaire comprised 2 sections and 19 items. It was distributed in the social media (a self-administered electronic questionnaire). The total number of participants was 455, all senior medical students and medical interns who are interested in orthopedic specialty have been included. Microsoft Excel was used for data management. After management, data were exported to Statistical Packages for Social Sciences version 23 analysis. Descriptive statistics were presented using frequency and percentages for categorical variables. Chi-square test was used to test the presence of association between categorical variabels. Level of significance was set at 0.05.

Results: A total of 388 participants were included in this study, 64.7% were males and 35.3% were females. Most important factors in e decision to pursue the field of orthopedics chosen by participants are as follows: 165 (42.5%) chose patient care aspects, 81 (20.9%) chose lifestyle, 17 (4.4%) chose basic science/research aspect, 12 (3.1%) chose pressure of family and/or peers. Most influencing individual for the participants to affect their choice of residency, 111 (28.6%) stated it was a health worker before medical school, 102 (23.3%) was a resident in the training program they plan to apply, 118 (30.4%) was a faculty in the program they plan to apply, 13 (3.4%) was a family member/family expectation. A significant difference between males and females ($p = 0.038$) was observed across the influence of work-life balance on the career choice.

Conclusion: This research suggested the medical students and interns to highlight a number of factors associated with specialty selection and provide an insight about the best ways to make a wise decision regarding specialty choice. However, the results of this study identified patient care aspects as the most important factor that influence them to choose orthopedics as a future career and the decision to choose orthopedics was most heavily influenced by training in medical school year 4 and 5. We advocate that perceptions and attitudes regarding orthopedic surgery must be changed to attract the best and brightest minds, regardless of sex. Finally, we encourage further research in this field with including orthopedic residents in future studies.

Keywords: *Orthopedics; interns; medical students; career choice; motivation; Saudi Arabia*

Introduction

Orthopedics is a part of medicine that is involved in prevention and treatment of musculoskeletal diseases like: musculoskeletal trauma, spine disease, sports injuries, tumors and congenital disorders. Physicians who work in this department should take five-year

residency training program to gain the necessary knowledge and experience. Then it is followed by fellowship subspecialties, like foot and ankle, hand surgery and upper extremity, joint preservation, orthopedic sports medicine, orthopedic trauma and pediatric orthopedics. Each subspecialty may take one year according to Washington University School of medicine in St. Louis.

The residents are facing many events through their lives that determine their choice in residency program like previous bone injuries or one of their relatives get injured, and other reasons for which they become interested in orthopedics.

However, the journey to orthopedics residency is challenging. Applicants to the orthopedics residency programs have to compete for the limited positions compared to the large number of candidates [1]. Certain characteristics of orthopedic surgery convinced candidates to stay motivated to follow the hard path to be matched and accepted in the program. Some studies have identified factors that motivate applicants to pursue a career in orthopedics [2].

A study that was conducted in Canada regarding factors affecting orthopedic residency selection revealed that Patient care aspects of orthopedics, including duration of surgery (exposure to the operating room as a trainee), patient population (diverse age and pathology on presentation), and type of work (surgical nature of the discipline) to be the most influential factors on choosing orthopedics residency [3]. Another study conducted in the GCC courtiers shows that personal interest, rotation during internship and the challenges orthopedics provides are the most important reasons for joining orthopedics [4].

Limited information exists regarding the factors that influence the choice of an orthopedic career in Saudi Arabia. To our knowledge, there has been no study that investigated specifically the factors that influence last year medical students and interns to choose orthopedics as a future career in Saudi Arabia. Therefore, the primary goal of this study is to investigate the factors influencing the choice of an orthopedic career among last year medical students and interns in Saudi Arabia and to help in guiding the students to improve their choice and avoid risks of burning out in undesired residency or wrong life career.

Method

The study area, sampling and data collection

A cross-sectional study with one stage sampling technique, that was conducted in Saudi Arabia to investigate the factors that influencing the choice of an orthopedic career among final year medical students and medical interns.

The study questionnaire was designed and developed through an extensive literature review. The validity of the questionnaire was obtained through a review process with experts in the field. After incorporating the identified inconsistencies and inaccuracies, the questionnaire was pre-tested with 5 final year medical students, 5 interns to identify any problem relating to question design, flow and interpretation.

The final questionnaire comprised 2 sections and 19 items. It was distributed and published after obtaining the ethical approval in the social media (a self-administered electronic questionnaire) from August first till October first 2020. Data collection has been done by medical students who received prior training for this task.

The survey began with explaining the aim of the study and taking the consent from all the participants before answering any question. Then the participants were asked to answer about 6 socio-demographical questions (age, gender, marital status, having children, level of training and which year, participant's university).

Assessment and comparison of factors affecting the participants' choice of orthopedic specialty

After finishing the five socio-demographical questions the participants asked to rate the 6 factors (patient care, future income, work-life balance, lifestyle, job prestige, opportunities for research) according to likert scale (1 = not at all important or strongly disagree, 2 = not important or disagree, 3 = neutral or undecided, 4 = important or agree, 5 = very important or strongly agree).

Then, the participants were asked to chose the most influencing factor of the following: patient care aspects, lifestyle, income, pressure from family and/or peers, basic science/research aspect. After that, they were asked 6 questions bout their choice of orthopedics as a Specialty: 3 "Yes and No" questions, and 3 multiple choses questions.

Finally, two comparison of assessment of the factors affecting the participants' choice of orthopedic have been done. The first is gender based. The second is having children based.

Inclusion criteria

All senior medical students and medical interns who are interested in orthopedic specialty have been included.

Statistical analysis

Microsoft Excel was used for data cleaning and management. After management, data were exported to Statistical Packages for Social Sciences (SPSS) version 23 analysis. Descriptive statistics were presented using frequency and percentages for categorical variables. Chi-square test was used to test the presence of association between categorical variabels. Level of significance was set at 0.05.

Results

In this study, the total number of participants had reached 388. Table 1 shows the sociodemographic profile of the participants. 251 (64.7%) were males and 137 (35.3%) were females. 329 (84.8%) were single, 48 (12.4%) were married, 9 (2.3%) were divorced, and 2 (0.5%) were widowed. Regarding having children, 22 (5.7%) had children and 366 (94.3%) did not.

Demographical Characteristics	N	%
Gender		
Male	251	64.7
Female	137	35.3
Marital Status		
Single	329	84.8
Married	48	12.4
Divorced	9	2.3
Widowed	2	0.5
Do you have children?		
Yes	22	5.7
No	366	94.3

Table 1: *Socio-Demographic Profile of The Participants (n = 388).*

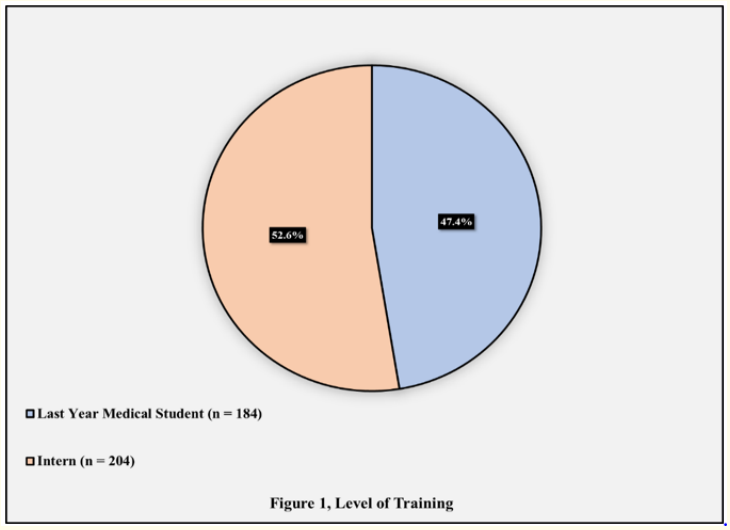

Figure 1: *Displays the level of training of participants. 184 (47.4%) were last year medical students and 204 (52.6%) were interns.*

Figure 2 demonstrates the Participants universities. The participants came from a 21 different universities. The universities with the highest rate of participants were: King Saudi University 83 (21.4%), King Faisal University 69 (17.8%).

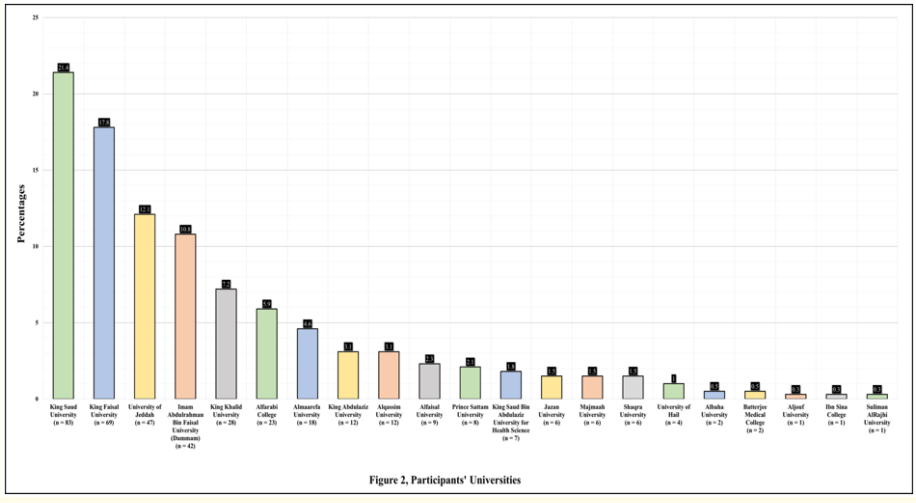

Figure 2: *Particioants Uaiversities.*

Table 2 shows the assessment of factors affecting the participants' choice of career. 91 (23.5%) identified patient care as an important factor in making a choice about the career and 258 (66.5%) identified it as very important. 163 (42%) identified income as an important factor in making a choice about the career and 139 (35.8%) identified it as very important. 91 (23.5%) identified work-life balance as an important factor in making a choice about the career and 174 (44.8%) identified it as very important. 128 (33%) identified job prestige as an important factor in making a choice about the career and 60 (15.5%) identified it as very important. 88 (22.7%) identified opportunities for research as an important factor in making a choice about the career and 55 (14.2%) identified it as very important.

Question	N	%
Q1/ How Patient Care is important to your career choice?		
Not important at all	3	0.8
Not so important	3	0.8
Neutral (undecided)	33	8.5
Important	91	23.5
Very important	258	66.5
Q2/ How important was income to your career choice?		
Not Important at All	6	1.5
Not So Important	13	3.4
Neutral (Undecided)	67	17.3
Important	163	42
Very Important	139	35.8
Q3/ How Work-life balance is important to your career choice?		
Not Important at All	3	0.8
Not So Important	7	1.8
Neutral (Undecided)	113	29.1
Important	91	23.5
Very Important	174	44.8
Q4/ How Lifestyle is important to your career choice?		
Not Important at All	4	1
Not So Important	13	3.4
Neutral (Undecided)	120	30.9
Important	114	29.4
Very Important	137	35.3
Q5/ How Job prestige is important to your career choice?		
Not Important at All	14	3.6
Not So Important	46	11.9
Neutral (Undecided)	140	36.1
Important	128	33
Very Important	60	15.5
Q6/ How Opportunities for research is important to your career choice?		
Not Important at All	20	5.2
Not So Important	51	13.1
Neutral (Undecided)	174	44.8
Important	88	22.7
Very Important	55	14.2

Table 2: *Assessment of factors affecting the participants' choice of career (n = 388).*

Figure 3 displays the most important factors in the decision to pursue to the field of orthopedics medicine/surgery. 165 (42.5%) identified patient care aspects as the most important factor, 81 (20.9%) identified lifestyle as the most important factor, 17 (4.4%) identified basic science/research aspect as the most important factor, 12 (3.1%) identified pressure family and/or peers as the most important factor, and 45 (11.6%) said other than that.

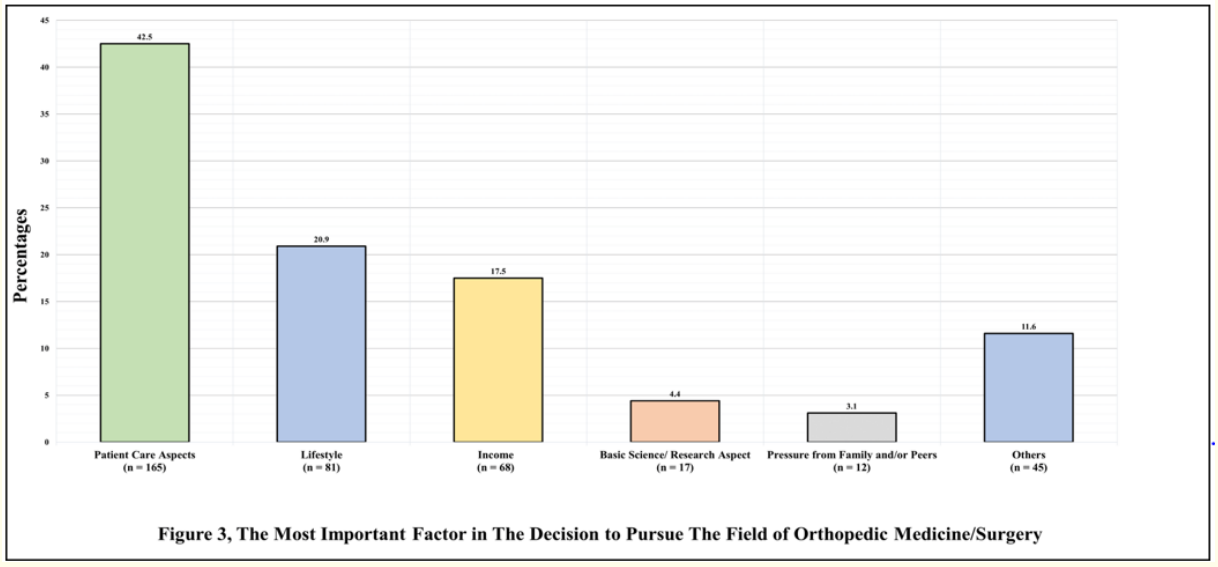

Figure 3: *The Most Important Factor In The Decision To Pursue The Field Of Orthopedic Medicine Surgery.*

Table 3 demonstrates the participants answers toward questions about their choice of orthopedics as a specialty. 123 (31.7%) stated they knew they wanted to get into orthopedics before starting medical school. When asked about the thing that most heavily influenced the participants choice of orthopedics as specialty, 89 (22.9%) reported an experience before medical school, 90 (23.2%) reported training in medical school year 2 and 3, 181 (46.6%) reported training in medical school year 4 and 5, and 28 (7.2%) reported other influential factors. When asked about the individual that most heavily influenced the choice of residency for the participants, 111 (28.6%) stated it was a health worker from before medical school, 102 (26.3%) stated it was a resident in the training program they plan to apply to, 118 (30.4%) stated it was a faculty in the training program they plan to apply to, 13 (3.4%) stated it was a family member/family expectations, and 44 (11.3%) stated it was other than the previous choices. Among the participants, 221 (57%) had a required rotation in orthopedic surgery, 39 (10.1%) took a rotation in orthopedics during their internship, and 253 (65.2%) did not take an orthopedic rotation in their internship yet but they will. When asked about their current status after taking orthopedic rotation, 59 (15.2%) stated they have already decided to pursue a career in orthopedics, 45 (11.6%) stated that the rotation inspired them to pursue a career in orthopedics, 93 (23%) stated that other factors more heavily influenced their decision to pursue orthopedics, 41 (10.6%) stated that the rotation inspired an interest in orthopedics, but they didn't/won't apply because they didn't think they could successfully match into this field. 29 (7.5%) decided against a career in orthopedics, and 121 (31.2%) did not find the answer applicable as they have not yet taken a rotation in orthopedics.

Answers Toward Questions About Their Choice of Orthopedics As a Specialty (n = 388)		
Question	**N**	**%**
Q1/ Regarding my career choice, I pretty much knew I wanted to go into this field before starting medical school.		
True	123	31.7
False	265	68.3
Q2/ My decision to go into orthopedics was most heavily influenced by:		
Experiences before medical school	89	22.9
Training in medical school year 2 and 3	90	23.2
Training in medical school year 4 and 5	181	46.6
Other	28	7.2
Q3/ The individuals that have most influenced my residency choice are:		
Health care providers before medical school	111	28.60
Residents in the type of training program I plan to apply to	102	26.30
Faculty in the type of training program I plan to apply to	118	30.40
Family member and/or family expectations	13	3.40
Other	44	11.30
Q4/ Did you have a required rotation in orthopedic surgery?		
Yes	221	57
No	167	43
Q5/ Did you take an orthopedic surgery rotation during internship?		
Yes	39	10.1
No	96	24.7
Not yet, but I will	253	65.2
Q6/ If you took clinical rotation in orthopedic surgery, please select the best answer choice:		
I had already decided to pursue a career in orthopedics	59	15.20
This rotation inspired me to pursue a career in orthopedics	45	11.60
Other factors more heavily influenced my decision to pursue orthopedics.	93	24.00
This rotation inspired an interest in orthopedics, but I didn't / won't apply because I didn't think I could successfully match into this field	41	10.60
I decided against a career in orthopedics.	29	7.50
Not applicable	121	31.20

Table 3: *Answers Toward Questions About Their Choice of Orthopedics As a Specialty (n = 388).*

Table 4 shows a gender-based comparison of assessment of factors affecting the participants' choice of career. A significant difference between males and females (p = 0.038) was observed across the influence of work-life balance on the career choice. No significant difference was found between males and females across the influence of the following variables on the career choice: patient care, income, lifestyle, job prestige, and opportunities for research.

Question	Gender		P-Value
	Male (n = 251)	Female (n = 137)	
Q1/ How Patient Care is important to your career choice?			
Not Important at All	3 (1.2%)	0 (0%)	0.063
Not So Important	3 (1.2%)	0 (0%)	
Neutral (Undecided)	15 (6%)	18 (13.1%)	
Important	59 (23.5%)	32 (23.4%)	
Very Important	171 (68.1%)	87 (63.5%)	
Q2/ How important was income to your career choice?			
Not Important at All	4 (1.6%)	2 (1.5%)	0.416
Not So Important	9 (3.6%)	4 (2.9%)	
Neutral (Undecided)	37 (14.7%)	30 (21.9%)	
Important	105 (41.8%)	58 (42.3%)	
Very Important	96 (38.2%)	43 (31.4%)	
Q3/ How Work-life balance is important to your career choice?			
Not Important at All	3 (1.2%)	0 (0%)	0.038*
Not So Important	6 (2.4%)	1 (0.7%)	
Neutral (Undecided)	69 (27.5%)	44 (32.1%)	
Important	50 (19.9%)	41 (29.9%)	
Very Important	123 (49%)	51 (37.2%)	
Q4/ How Lifestyle is important to your career choice?			
Not Important at All	3 (1.2%)	1 (0.7%)	0.136
Not So Important	6 (2.4%)	7 (5.1%)	
Neutral (Undecided)	69 (27.5%)	51 (37.2%)	
Important	77 (30.7%)	37 (27%)	
Very Important	96 (38.2%)	41 (29.9%)	
Q5/ How Job prestige is important to your career choice?			
Not Important at All	10 (4%)	4 (2.9%)	0.518
Not So Important	27 (10.8%)	19 (13.9%)	
Neutral (Undecided)	90 (35.9%)	50 (36.5%)	
Important	80 (31.9%)	48 (35%)	
Very Important	44 (17.5%)	16 (11.7%)	
Q6/ How Opportunities for research is important to your career choice?			
Not Important at All	18 (7.2%)	2 (1.5%)	0.179
Not So Important	31 (12.4%)	20 (14.6%)	
Neutral (Undecided)	109 (43.4%)	65 (47.4%)	
Important	57 (22.7%)	31 (22.6%)	
Very Important	36 (14.3%)	19 (13.9%)	

Table 4: *Gender based comparison of assessment of factors affecting the participants' choice of career (n = 388).*

Table 5 shows a children-based comparison of assessment of factors affecting the participants' choice of career. A significant difference between those who have children and those who do not have children was observed across the following factors: patient care ($p = 0.001$), income ($p < 0.001$), and research opportunities ($p = 0.037$). No significant difference between those who have children and those who do not have children was seen across the following factors: income, work-life balance, and job prestige.

Question	Do you have children?		P-Value
	Yes (n = 22)	No (n = 366)	
Q1/ How Patient Care is important to your career choice?			
Not Important at All	0 (0%)	3 (0.8%)	0.011*
Not So Important	0 (0%)	3 (0.8%)	
Neutral (Undecided)	6 (27.3%)	27 (7.4%)	
Important	7 (31.8%)	84 (23%)	
Very Important	9 (40.9%)	249 (68%)	
Q2/ How important was income to your career choice?			
Not Important at All	0 (0%)	6 (1.6%)	0.861
Not So Important	1 (4.5%)	12 (3.3%)	
Neutral (Undecided)	4 (18.2%)	63 (17.2%)	
Important	11 (50%)	152 (41.5%)	
Very Important	6 (27.3%)	133 (36.3%)	
Q3/ How Work-life balance is important to your career choice?			
Not Important at All	0 (0%)	3 (0.8%)	0.533
Not So Important	1 (4.5%)	6 (1.6%)	
Neutral (Undecided)	9 (40.9%)	104 (28.4%)	
Important	5 (22.7%)	86 (23.5%)	
Very Important	7 (31.8%)	167 (45.6%)	
Q4/ How Lifestyle is important to your career choice?			
Not Important at All	0 (0%)	4 (1.1%)	< 0.001*
Not So Important	4 (18.2%)	9 (2.5%)	
Neutral (Undecided)	11 (50%)	109 (29.8%)	
Important	2 (9.1%)	112 (30.6%)	
Very Important	5 (22.7%)	132 (36.1%)	
Q5/ How Job prestige is important to your career choice?			
Not Important at All	0 (0%)	14 (3.8%)	0.217
Not So Important	2 (9.1%)	44 (12%)	
Neutral (Undecided)	13 (59.1%)	127 (34.7%)	
Important	5 (22.7%)	123 (33.6%)	
Very Important	2 (9.1%)	58 (15.8%)	
Q6/ How Opportunities for research is important to your career choice?			
Not Important at All	2 (9.1%)	18 (4.9%)	0.037*
Not So Important	1 (4.5%)	50 (13.7%)	
Neutral (Undecided)	16 (72.7%)	158 (43.2%)	
Important	3 (13.6%)	85 (23.2%)	
Very Important	0 (0%)	55 (15%)	

Table 5: *Having Children-Based Comparison of Assessment of Factors Affecting the Participants' Choice of Career (N = 388).*

Discussion

This study showed the sociodemographic status of the participants. Of 388 participants, 64.7% were males while 35.3% were females. As for martial state, 84.8% were single, 12.4% were married, 2.3% were divorced, and only 0.5% were widowed. Regarding parenthood, 5.7% of the participants had children while 94.3% did not. Other study showed that was carried on 103 medical interns in Saudi Arabia showed that 55.3% of their participants were male while the female constituted 44.7%. 76.7% of them are married and 23.3% were single [5].

The research also highlighted the factors that influence the participants' choice of orthopedics specialty. 23.5% identified patient care as an important factor while 66.5% identified it as very important and 0.8% as not important at all. 42% state income as an important factor while 35.8% identified it as very important and 1.5% as not important at all. As for work-social life, 23.5% identified it as important factor and 44.8% identified it as very important and 0.8% as not important at all. Regarding occupational status and prestige, 33% identified it as an influencing factor while 15.5% identified it as very important and 3.6% as not important at all. Lastly, 22.7% of the participants stated opportunities for research as an important factor in decision making while only 14.2% identified it as very important while 5.2% identified it as not important at all. In the same previous mentioned study, patient care was an influencing factor in the opinion of 51.5% of participants. While 15.5% of them disagreed. As for the good outcome 47.6 agreed that it is an important factor while 14.6 disagreed. For specialty social lifestyle, 8.7% disagreed that it is an influencing factor, 57% agreed, while 34% partially agreed. Regarding the affection of prestige on specialty selection, 34% agreed that it has major effect, 45.6% partially agreed and 20.4% disagreed [5].

Most important factors in the decision to pursue the field of orthopedics chosen by participants are as follow: (42.5%) chose patient care aspects, (20.9%) chose lifestyle, (4.4%) chose basic science/research aspect, (3.1%) chose pressure of family and/or peers. As for the most influencing individual for the participants' choice of orthopedics, (28.6%) stated it was a health worker before medical school, (23.3%) was a resident in the training program they plan to apply, (30.4%) reported that it was a faculty in the program they plan to apply to, (3.4%) was a family member/family expectation. A significant difference between males and females ($p = 0.038$) was observed across the influence of work-life balance on the career choice. Another research that was conducted on the factors influencing orthopedics specialty choice found that out of 232 participants 201 (87.5%) were interested in orthopedics, about 80 (34.5) of them are affected by elective rotation, while 74 (31.1%) thought that it is the future job, 67(28.9%) found it in clerkship, 64 (27.6%) want to serve the community, 56 (24.1) because of research opportunities, 45(19.4%) suspect high outcome, 20 (8.6%) followed their friends advice, while 19(8.2%) were influenced by their families [6].

Regarding gender-based comparison of assessment of factors affecting the participants' choice of career. A significant difference between males and females was observed across the influence of work-life balance on the career choice. However, there's no significant difference was found between males and females across the influence of the following variables on the career choice: patient care, income, lifestyle, job prestige, and opportunities for research. Keith Baldwin., *et al.* reported that female interest in orthopedics is low as compared to male due to the long working hours, physical demands, and predominantly male nature of the field [7].

As for the effect of having children on participants' choice of career, this finding is consistent with the previous studies addressing the same influence. Heiligers highlighted that having children is deeply related to the choice of general practice above medical specialties this is because it is more compatible with family life than a medical specialty. Heiligers., *et al.* reported that women who living with partners are more focused on life-styles motives and prefer non-surgery specialty compared with women who did not have partners [8]. Sasser highlighted that female physicians are sharply reduced their hours of work after having children this is due to greater family responsibilities [9]. Pas., *et al.* emphasized that having children nor the age of the youngest child is significantly affects the career motivation of female doctors [10].

Conclusion

The results of this study identified patient care aspects as the most important factor that influence last year medical students and interns to choose orthopedics as a future career. The decision to go into orthopedics was most heavily influenced by training in medical school year 4 and 5. Knowledge of specific factors associated with selection of orthopedic specialty should help orthopedic program directors attract best candidates to join orthopedic residency programs. Based on this study, we recommend program directors to work on other modifiable factors to enhance the chances of recruiting future applicants to orthopedic programs. Furthermore, perceptions and attitudes regarding orthopedic surgery must be changed to attract the best and brightest minds, regardless of sex. In addition, this work is to be recommended for medical students and interns who consider orthopedics as a future career to highlight a number of factors associated with specialty selection and provide an insight about the best ways to make a wise decision regarding specialty choice. We encourage further research in this field with including orthopedic residents in future studies.

Ethical Approval

This study has been performed in accordance with the ethical standards of King Fahad Medical City, Agust 10, 2020.

IRB registration number with KACST, KSA: H-01-R-012

IRB registration number with OHRP/NIH, USA: IRB00010471

Approval number federal wide assurance NIH, USA: FWA00018774

Competing Interests

The authors declare that they have no conflict of interests.

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Author Contributions

Mohammed K Alsaleem worked as a supervisor, design the study and revise the paper before submission. Abdullah M Alkhars and Adia A Almutairi; help in design the study, facilitate the statistical analysis for the data, writing the manuscript, and process of submission the paper. Arwa H AlOnayzan; helps in writing the manuscript and process of submission the paper. Riyad K Almasaud and Ali A AL Khalaf; help in data collection and writing the manuscript. Abdulwahab N Aladhyani; helps in data collection.

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