

Challenges faced by female oral and maxillofacial surgeons in conservative societies: a gender-based analysis

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Abstract

Oral and Maxillofacial Surgeons (OMFSs) face peculiar challenges that may hinder surgical careers and jeopardize job satisfaction. More data are necessary on these challenges, particularly among females in conservative societies and politically unstable areas. This study aimed to perform a gender-based analysis of social and professional challenges faced by OMFSs in Egypt, Jordan, Libya, and Saudi Arabia. An online questionnaire was distributed among OMFSs to explore career-hindering factors, factors influencing OMFS career choice by female surgeons, and surgeons' preferences for online educational platforms. The results showed that male professionals performed more surgical

procedures under general anesthesia and identified "financial revenues" as a significant career obstacle ($p \leq 0.05$). Regarding the most important factors that impact female surgeons' choice of OMFS career, significantly more females cited "lack of mentors" ($p = 0.012$), while significantly more males cited "marriage" and "having children" ($p = 0.001$). Further, significantly more males stated that "males are better suited for leadership positions" ($p < 0.001$). Female OMFSs in conservative societies encounter challenging social and professional barriers, which may adversely affect job stability and career aspirations. Adopting policies that promote a work-family balance for female surgeons and providing institutions with a sufficient number of mentors may be crucial in mitigating the obstacles and challenges they face. Further leadership opportunities should be made accessible to women, supported by establishing an inclusive and unbiased environment that engages all stakeholders, regardless of their gender.

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Introduction

Oral and Maxillofacial Surgery (OMFS) is an interdisciplinary specialty between dentistry and surgery. Oral and Maxillofacial Surgeons (OMFSs) perform versatile procedures that address challenging diseases affecting the head and neck region, such as cancer, trauma, and developmental malformations. Moreover, close collaboration between surgical and non-surgical teams is required to enhance overall treatment outcomes inherently directed toward patients' functional and aesthetic needs.

Gender diversity in surgical workforces promotes favorable treatment outcomes and increases patients' satisfaction and quality of life. Increasing women's participation in surgical careers is projected to enhance and sustain healthcare resources, thereby mitigating the global surgical burden.¹ Female physicians were described as being more careful, better communicators, and adherent to the clinical guidelines.² They are also preferred to male surgeons among a substantial proportion of the female patient population who feel more comfortable when seeking healthcare from female surgeons³ and who were reported to have several health disparities in low-resource settings.⁴ Further, recent studies highlight a high rate of adverse surgery outcomes when female patients are treated by male surgeons, a trend that was not identified when female surgeons treat male patients.⁵

While the overall healthcare sector has made major steps towards inclusivity and gender equity, disparities still persist in various medical fields, especially in surgical disciplines.^{6,7} In conservative cultures such as those in Arabic societies, understanding gender diversity is particularly important. It highlights the need to assess the interplay between gender dynamics, societal expectations, and professional experiences to enhance the understanding and appreciation of the features of this surgical subspecialty.⁷

For many decades, the Arabic region has experienced protract-

ted political instability and armed conflicts, triggering numerous difficulties for healthcare systems, particularly surgical disciplines such as OMFS. These low-resource settings are further jeopardized by the increasing rates of migration of highly qualified surgeons who aspire to more prosperous careers in politically stable countries.⁸ Previous research highlighted several challenges and obstacles faced by OMFSs, particularly female surgeons.⁹ Globally, a biased, less welcoming work environment and sexual harassment were perceived as major obstacles.¹⁰ On the other hand, in conservative countries, female surgeons highlighted “lack of mentors” and “long working hours” as the major career obstacles.³ More follow-up studies are warranted to provide an in-depth analysis of these challenges, particularly the perceptions of male surgeons, who constitute the largest proportion of the surgical workforce and who occupy more influential leadership positions.¹¹ Therefore, we conducted this study in four Arabic countries using a gender-specific approach to evaluate challenges that face OMFSs, assess factors that influence female surgeons’ career choices, identify training preferences for online educational platforms, and lastly, explore perceptions of female representation in leadership positions.

Materials and Methods

Study design

This study employed a cross-sectional survey utilizing an online questionnaire created with Google Forms, based on a previous similar study.⁸ A pilot test was performed to ensure clarity and reproducibility. Ten male and female surgeons from each country were invited to complete the questionnaire on two separate occasions, one week apart. Calculated Cronbach’s alpha (0.72) and Kappa (0.79) were considered acceptable. The questionnaire was composed of an introductory section on the objectives of the study and the anonymous nature of participation. This was followed by 37 closed-ended questions on socio-professional characteristics (age, gender, marital status, parental status, specialization country, work country, years of experience, professional setting, weekly number of in-patients, and weekly number of out-patients); perceived socio-professional factors that may hinder career (financial revenues, peer appreciation, uncooperative boss, patient respect, patient flow, spouse career, spouse appreciation, family responsibilities, medical illness, physical complaints, time for professional development); perceptions on factors influencing the OMFS career choice by female surgeons (lack of mentors, long working hours, marriage, children, society); perceptions on gender-specific leadership roles; and preferences on surgical topics for which YouTube platform is consulted.

Study participants

A convenient sample of OMFSs was invited to participate by co-authors who were members of local dental associations through local professional social networks as follows: HR and SE in Egypt, SR in Jordan, SE in Saudi Arabia, and MA in Libya. Participants were invited to complete the questionnaire during May 2023. A second round of invitations was performed in June 2023. Participants were included if they were Arabic surgeons practicing OMFS in one of the four participating countries. Participants who were identified as working outside these countries were excluded. A total of 137 surgeons participated, with 74 males (54.0%) and 63 females (46.0%).

Data analysis

Statistical analysis was conducted using IBM SPSS software for Windows (SPSS version 25, Armonk, NY: IBM Corp) to calculate descriptive data, including range, mean, and standard deviation of age and years of experience, frequencies, and percentages of socio-professional groups. Descriptive data were also calculated for surgeons’ preferences for professional development on various surgical topics using the YouTube platform. Participating countries were divided into two groups according to the income level as defined by the World Bank. The first category constituted Saudi Arabia (High income), Jordan, and Libya (upper middle income), and the second category constituted Egypt (lower middle income). The chi-square test was used to assess the significance of the association between gender and socio-professional characteristics, socio-professional career factors, and socio-professional factors perceived by participants to influence females’ choice of the OMFS career. A p -value of ≤ 0.05 was considered significant.

Ethics approval

Ethics approval was obtained from the Faculty of Dental Medicine, Al Azhar University, Egypt (Protocol #EPI-IB 201). The study was carried out in accordance with the World Medical Declaration of Helsinki.

Results

Data were analyzed to describe the socio-professional characteristics of participants, career barriers, and factors that influence female surgeons’ preference for OMFS career path. The socio-professional characteristics of participants are presented in Table 1. Males were more likely to be married, have children, and larger families ($p < 0.05$). In contrast, females were more likely to receive training and work in lower-income countries ($p < 0.001$). Additionally, males tended to perform a greater number of procedures under general anesthesia each week ($p = 0.018$).

Table 2 revealed that most male and female surgeons confirmed the important influence of all socio-professional factors, except “spouse career”, which was considered “not important”. “Financial revenues” was the most highly cited career obstacle among males (97.3%), in contrast to “family responsibilities”, which was the most highly cited factor among females (95.2%). A statistically significant higher proportion of males considered “financial revenues” as a barrier to their career ($p = 0.044$). Participants indicated which factors influence female surgeons’ choice of OMFS career (Table 3); significantly, more females identified “lack of mentors” as an important factor in their choice of OMFS career ($p = 0.012$). While more males perceived that “marriage” and “having children” are important factors in females’ OMFS career choice ($p = 0.001$). When exploring perceptions of women’s professional representation and participation in leadership positions, females were more likely to feel under-represented in the profession. However, the difference was not statistically significant ($p > 0.05$). Further, significantly more females perceived that “both genders can equally be leaders” ($p < 0.001$), while significantly more males stated that “males are better suited in leadership positions”, and that there are “none or fewer female leaders than males” ($p < 0.05$) (Table 4). The study also conducted a gender analysis of continuous education using YouTube as an important platform in surgical training. There were no statistically significant differences between genders in their referral to YouTube platform ($p > 0.05$). Further, the most frequently cited disciplines were aesthetic surgery and oncology, while dento-

alveolar surgery was the least cited (Figure 1). The last section of the questionnaire presented an open space for surgeons to express their feelings about the *status quo* of the profession and their assessment of the future. Only 21 participants (9 males and 12 females) provided comments, which were summarized in five themes. The first three themes were cited by males as follows: (1) OMFS is inherently associated with tension and effort; (2) I feel passionate and content with the OMFS career; (3) all genders are suitable for this profession, and nowadays we see more participation from female surgeons. The last two themes were cited by females as follows: (1) challenges for female surgeons are mainly children's responsibilities and poor society acceptance of female surgeons; (2) more continuing education activities are desirable, however, there are some obstacles, such as lack of mentorship, costly courses, and the inability to obtain specialization abroad.

Table 1. Socio-professional characteristics of participating oral and maxillofacial surgeons.

Socio-professional characteristics of participants	Gender		p
	Male (%)	Female (%)	
Age (years)			
<40	38 (51.4)	36 (57.1)	0.606
≥40	36 (48.6)	27 (42.9)	
Marital status			
Single	8 (10.8)	18 (28.6)	0.038*
Married	62 (83.8)	41 (65.1)	
Divorced	4 (5.4)	3 (4.8)	
Widow	0 (0.0)	1 (1.6)	
Ever married			
Single	12 (16.2)	22 (34.9)	0.017*
Married	62 (83.8)	41 (65.1)	
Have children			
No	14 (18.9)	25 (39.7)	0.008*
Yes	60 (81.1)	38 (60.3)	
Number of children			
No children	13 (17.6)	25 (39.7)	0.010*
1-2 children	21 (28.4)	17 (27.0)	
>2 children	40 (54.1)	21 (33.3)	
Work country			
UIC/UMIC	63 (85.1)	14 (22.2)	0.000*
LIC	11 (14.9)	49 (77.8)	
Specialization country			
UIC/UMIC	47 (63.5)	11 (17.5)	0.000*
LIC	27 (36.5)	52 (82.5)	
Professional setting			
Academic	23 (31.1)	27 (42.9)	0.258
Public sector	31 (41.9)	25 (39.7)	
Private sector	20 (27.0)	11 (17.5)	
Years of experience			
<10	43 (58.1)	42 (66.7)	0.378
≥10	31 (41.9)	21 (33.3)	
Weekly procedures under GA			
≤5	55 (74.3)	52 (82.5)	0.018*
>6	19 (25.7)	11 (17.5)	
Weekly number of out-patients			
<20	15 (20.3)	19 (30.2)	0.101
20-30	20 (27.0)	19 (30.2)	
31-40	15 (20.3)	4 (6.3)	
>40	24 (32.4)	21 (33.3)	

*Statistically significant difference; UIC, upper-income country; UMIC, upper-middle-income country; LIC, lower-income country; GA, general anesthesia.

Discussion

Including a diverse, sustainable, and integrated workforce in the OMFS specialty is expected to fulfill the professional outcomes of surgeons and the treatment needs of patients. As the profession of OMFS continues to evolve, an essential aspect worthy of careful exploration is gender analysis of social and professional challenges faced by surgeons. This study utilized a gender-based approach to investigate social and professional career obstacles faced by OMFSs in four Arabic countries as an example of conservative societies that have similar cultural backgrounds and social perspectives. Understanding the complex interplay between gender, social dynamics, and professional experiences is crucial not only for advancing diversity but also for fostering an environment that allows all practitioners to thrive and contribute to the advancement of the profession.

Several studies have investigated career obstacles in the field of OMFS globally and regionally.^{3,7,8,12} Regionally, previous research estimated that males had higher career satisfaction, perceiving that it was the right career path.⁷ Females, on the other hand, were confident that they had what it took to be more suitable than males for the OMFS career;⁷ however, they cited specific social factors as

Table 2. Socio-professional factors perceived by participants to be limiting to their careers.

Socio-professional career factors	Gender		p
	Male (%)	Female (%)	
Financial revenues			
Not important	2 (2.7)	8 (12.7)	0.044*
Important	72 (97.3)	55 (87.3)	
Peer appreciation			
Not important	4 (5.4)	4 (6.3)	1.000
Important	70 (94.6)	59 (93.7)	
Uncooperative boss			
Not important	10 (13.5)	7 (11.1)	0.797
Important	64 (86.5)	56 (88.9)	
Time for professional development			
Not important	4 (5.4)	7 (11.1)	0.345
Important	70 (94.6)	56 (88.9)	
Patient flow			
Not important	7 (9.5)	8 (12.7)	0.592
Important	67 (90.5)	55 (87.3)	
Patients' respect			
Not important	5 (6.8)	11 (17.5)	0.064
Important	69 (93.2)	52 (82.5)	
Medical illness			
Not important	9 (12.2)	6 (9.5)	0.785
Important	65 (87.8)	57 (90.5)	
Physical complaints			
Not important	8 (10.8)	11 (17.5)	0.324
Important	66 (89.2)	52 (82.5)	
Spouse appreciation			
Not important	3 (4.1)	4 (6.3)	0.703
Important	71 (95.9)	59 (93.7)	
Spouse career			
Not important	45 (60.8)	33 (52.4)	0.387
Important	29 (39.2)	30 (47.6)	
Family responsibilities			
Not important	7 (9.5)	3 (4.8)	0.342
Important	67 (90.5)	60 (95.2)	

*Statistically significant difference.

obstacles to their career progress.⁸ Analysis of the semi-professional characteristics of participants in this study gives an insight into their perceptions and sheds light on the current professional environment. Similar to other studies conducted among surgeons in other disciplines, males were more likely to be married and to have larger families with more children.¹³ A study conducted in Jordan, Saudi Arabia, and Egypt estimated that a substantial proportion of female surgeons were either single or divorced, in contrast to most male surgeons who were married.⁸ A similar trend was identified in more modernized societies. Most female surgeons want children; however, they often perceive workplace bias against pregnant female trainees. Consequently, they postpone or refrain from having children, trying to mitigate the conflict with the surgical career.¹⁴ For those who manage to become pregnant during training years, a substantial proportion may experience miscarriage or other adverse pregnancy outcomes, which may increase the need for assisted reproductive therapy in the future.^{14,15} Therefore, more studies are now calling for adopting policies that conform with the “basic human nature” of having a family even during surgical training years.¹² Other sociodemographic characteristics were noted in this study. Participants from Egypt were mostly females, contrary to other countries. This likely represents the current predominance

Table 3. Socio-professional factors perceived by participants to influence the choice of females to pursue a career in oral and maxillofacial surgery.

Semi-professional factors influencing OMFS career choice of females	Gender		p
	Male (%)	Female (%)	
Lack of mentors			
Not important	18 (24.3)	5 (7.9)	0.012*
Important	56 (75.7)	58 (92.1)	
Long working hours			
Not important	5 (6.8)	6 (9.5)	0.745
Important	69 (93.2)	57 (90.5)	
Physical exertion			
Not important	12 (16.2)	19 (30.2)	0.066
Important	62 (83.8)	44 (69.8)	
Hostile work environment			
Not important	17 (23.0)	16 (25.4)	0.842
Important	57 (77.0)	47 (74.6)	
Sexual harassment			
Not important	31 (41.9)	26 (41.3)	1.000
Important	43 (58.1)	37 (58.7)	
Sexism by colleagues			
Not important	31 (41.9)	23 (36.5)	0.600
Important	43 (58.1)	40 (63.5)	
Sexism by patients			
Not important	27 (36.5)	24 (38.1)	0.861
Important	47 (63.5)	39 (61.9)	
Marriage			
Not important	4 (5.4)	16 (25.4)	0.001*
Important	70 (94.6)	47 (74.6)	
Having children			
Not important	3 (4.1)	15 (23.8)	0.001*
Important	71 (95.9)	48 (76.2)	
Society impact			
Not important	15 (20.3)	20 (31.7)	0.169
Important	59 (79.7)	43 (68.3)	

*Statistically significant difference.

of male surgeons in these countries, particularly in Saudi Arabia, where a large proportion of the OMFS workforce is made up of non-national male surgeons. In contrast to Egypt, the country's large female surgical workforce may face various social constraints that prevent them from working abroad.

Table 4. Perceptions of oral and maxillofacial surgeons on gender-specific leadership roles and female representation.

Perceptions on leadership gender roles	Gender		p
	Males	Females	
Female surgeons in leadership positions			
None or fewer than males	71 (95.9)	50 (79.4)	0.003*
Equal or more than males	3 (4.1)	13 (20.6)	
Males are better suited in leadership positions			
No	16 (21.6)	33 (52.4)	0.000*
Yes	58 (78.4)	30 (47.6)	
Both genders can be equally leaders			
No	28 (37.8)	7 (11.1)	0.000*
Yes	46 (62.2)	56 (88.9)	
Females are under-represented in OMF surgery			
No	32 (43.2)	17 (27.0)	0.052
Yes	42 (56.8)	46 (73.0)	

*Statistically significant differences.

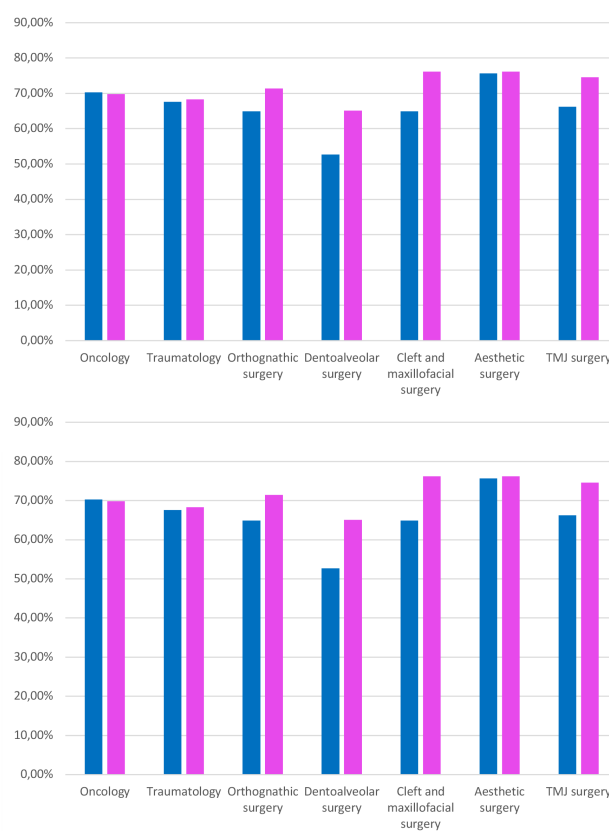


Figure 1. Gender distribution of oral and maxillofacial surgeons in consulting YouTube platform to enhance skills in various surgical disciplines.

Several potential social and professional obstacles were examined in this study. Among these, “financial revenues” stands out as the only obstacle that showed a significant difference between genders, with males being more concerned about this aspect. This is further affirmed by the fact that male surgeons, in this study, perform a higher number of financially rewarding procedures, such as procedures conducted under general anesthesia. This may highlight the social stereotype of the Arab male as being the “provider” and “breadwinner” for the family. It may also indicate that patients and/or institutions consider male surgeons more experienced and trustworthy to perform more complicated surgical procedures.¹⁶ However, it should be noted that several studies reported interesting findings linking better surgical outcomes with the female gender. Female surgeons were more likely to have longer operation times;¹⁷ however, they demonstrated more favourable surgical outcomes.¹⁸ This was explained by the inherent properties of women in using a patient-centered approach in decision-making, being selective of their patients for surgery, and being more willing to collaborate.¹⁹ The above observations are consistent with the findings of this study, which showed that “family responsibilities” was the most highly cited career obstacle among females. However, when asked about the factors that influence their career choice, the most highly cited factor among females was “lack of mentors”. This, together with their preference for obtaining specialization abroad, confirms the diligent and, probably, conscientious approach of females, who were more concerned about prospects of professional development and mentor availability. Role models or mentors have a significant influence on female surgical career choice.²⁰ Female mentors, in particular, have a significant role in motivating female trainees to move forward and overcome obstacles in the profession.^{21,22}

Participating male surgeons in this study believed that “marriage” and “having children” are the most important factors that influence female surgeons’ career choice. These perceptions seem to be consistent with the current views in conservative societies, which consider that women, regardless of their career stage, are expected to fulfill society’s expectations of getting married to establish a family and have children. Work-family balance is important for surgeons, irrespective of gender and geographic setting.²³ It should be noted that achieving this balance is not only the responsibility of surgeons themselves but also institutions and the healthcare system in general. Examples of such required support include the provision of maternity/paternity leave, childcare facilities, allowing time for breastfeeding, and improving access to medical care.²⁴

There were also significant differences between males and females in their views regarding leadership roles. Significantly more males perceived that females are not fit for leadership, contrary to females who perceived that “both genders can be equal leaders”. The lack of confidence in assuming leadership roles by females should be further investigated to explore the reasons behind these perceptions. It should be noted that lower participation of females in leadership positions is reported in many professions, mainly because leaders are seen to demonstrate masculine traits.^{25–27} Within the context of OMFS, however, female and male surgeons were in agreement that there are no physical or mechanical disadvantages associated with female gender.²⁸ Specific strategies may be implemented to assist women in leadership, such as identifying potential leaders early on, establishing mentorship programs, and training men and women in management to provide support.^{29–31} It was important in this study to assess the surgeons’ continuous education activities using popular platforms^{32,33} such as YouTube. Almost seven in ten surgeons stated that they refer to

YouTube for professional development. Males and females were comparable in referring mostly to aesthetic surgery- and oncology-related content. These two disciplines are highly advanced; therefore, training years may be insufficient for obtaining the required competencies. This highlights the importance of revising surgical training *curricula* to accommodate advanced competencies. More recently, several oral, head, and neck oncologic and reconstructive surgery fellowships were established in an effort to increase trainees’ exposure to ablative and reconstructive head and neck surgery.³⁴ This experience can be replicated in other countries, particularly Middle Eastern countries, where the vulnerable political atmosphere and armed conflicts increase the demand for reconstructive surgery, including microvascular reconstruction.

The study has limitations represented by the convenient sampling method and low participation rate, particularly from Saudi Arabia. Two rounds of data collection were performed to minimize this deficiency. Future studies should recruit larger and more randomized samples to improve representativeness and generalizability of results. While it was not possible to accurately determine the number of OMFSs practicing in the participating countries, the number of participants exceeded that of previous relevant studies conducted in this geographic area. Future longitudinal studies may be conducted to track career progression and advancement. Other recommendations include employing qualitative methods that explore personal experiences, which could complement and enrich the quantitative data.

Conclusions

Male oral and maxillofacial surgeons in the Arabic region show approval of female participation in the surgical career; however, their uncertainty towards female contribution to leadership roles should be assessed further in future studies. Factors influencing females’ decision to delay starting a family should be addressed, particularly for trainees. Policies that enhance flexibility in maternity leave and childcare facilities are recommended. The work environment should maintain enough dedicated mentors and establish reconstructive and head and neck oncology fellowships to advance oral and maxillofacial surgery in the Arabic region.

References

1. Busa I, Nagraj S. Women as a driver to address gaps in the global surgical workforce. *Hum Resour Health* 2023;21:22.
2. Roter DL, Hall JA. Physician gender and patient-centered communication: A critical review of empirical research. *Annu Rev Public Health* 2004;25:497-519.
3. Al Ryalat N, Ryalat S, Al-Abdalla M, et al. Women in maxillofacial surgery and otolaryngology: career obstacles and success factors. *J Craniofac Surg* 2021;32:874-7.
4. Dar-Odeh NS, Aleithan FA, Alnazzawi AA, et al. Factors affecting oral health determinants in female university students: A cross-sectional survey in Saudi Arabia. *Int J Adolesc Med Health* 2020;32.
5. Slomski A. Female patients fare worse with male surgeons. *JAMA* 2022;327:416.
6. Carnevale M, Phair J, Batarseh P, et al. Gender disparities in academic vascular surgeons. *J Vasc Surg* 2020;72:1445-50.
7. Abu-Hammad S, Elsayed SA, Nourwali I, et al. Influence of gender on career expectations of oral and maxillofacial surgeons.

- ons. *J Craniomaxillofac Surg* 2020;48:458-62.
8. Dar-Odeh N, Elsayed SA, Nourwali I, et al. Social factors as career obstacles for female oral and maxillofacial surgeons in three Middle Eastern countries. *Int J Oral Maxillofac Surg* 2019;48:1504-8.
9. Williams GA, Jacob G, Rakovac I, et al. Health professional mobility in the WHO European Region and the WHO Global Code of Practice: Data from the joint OECD/EUROSTAT/WHO-Europe questionnaire. *Eur J Public Health* 2020;30:iv5-11.
10. Haviland C, Moe JS. The Diversity Bonus in Oral and Maxillofacial Surgery. *Oral Maxillofac Surg Clin North Am* 2021;33:505-13.
11. Rivera JC, Hauc SC, Juan HY, et al. Assessment of sex diversity among craniofacial academic faculty. *J Craniofac Surg* 2023;34:202-5.
12. Hughes PJ. Gender Issues and oral and maxillofacial surgery advanced education program accreditation. *Oral Maxillofac Surg Clin North Am* 2021;33:429-33.
13. Hobday SB, Armache M, Frost AS, et al. Gender differences among head and neck microvascular reconstructive surgeons. *Otolaryngol Head Neck Surg* 2023;169:1143-53.
14. Kontoghiorghe C, Morgan C, Eastwood D, McNally S. UK pregnancy in orthopaedics (UK-POP): a cross-sectional study of UK female trauma and orthopaedic surgeons and their experiences of pregnancy. *Bone Jt Open* 2023;4:970-9.
15. Stefanou AJ. Fertility and pregnancy: how do these affect family planning and surgeon health? *Clin Colon Rectal Surg* 2023;36:327-32.
16. AlSamhori JF, Rayyan R, Hammouri M, et al. Factors influencing gender preference towards surgeons among Jordanian adults: an investigation of healthcare bias. *Sci Rep* 2023;13.
17. Blohm M, Sandblom G, Enochsson L, Österberg J. Differences in cholecystectomy outcomes and operating time between male and female surgeons in Sweden. *JAMA Surg* 2023;158:1168-75.
18. Wallis CJD, Jerath A, Aminoltejeri K, et al. Surgeon sex and long-term postoperative outcomes among patients undergoing common surgeries. *JAMA Surg* 2023;158:1185-94.
19. Almquist M. Are women better surgeons than men? *JAMA Surg* 2023;158:1175.
20. Schizas D, Papapanou M, Routsi E, et al. Career barriers for women in surgery. *Surgeon* 2022;20:275-83.
21. Xu AL, Humbyrd CJ, De Mattos CBR, LaPorte D. The importance of perceived barriers to women entering and advancing in orthopaedic surgery in the US and beyond. *World J Surg* 2023;47:3051-9.
22. Wonda O, Irab S, Tingginehe R. Factors related to the activeness of posyandu cadres in the working area of the Yamo Health Center, Puncak Jaya Regency. *Formosa J Sci Technol* 2024;3:1965-80.
23. Wahjuningdiah ED, Paskarini I. The relationship between family support and work-family balance among Surabaya health facility security center employees during the COVID-19 pandemic. *Indones J Occup Saf Heal* 2022;11:454-62.
24. Alkhawashki S, Alasiri R, Ruetalo M, Maggi J. The double whammy: Advanced medical training and parenting. *Medicine (United States)* 2024;103:E36697.
25. Tremmel M, Wahl I. Gender stereotypes in leadership: Analyzing the content and evaluation of stereotypes about typical, male, and female leaders. *Front Psychol* 2023;14:1034258.
26. Sunaryo S, Rahardian R, Risgiyanti, et al. Leader-member exchange and glass ceiling: the effects on career satisfaction and work engagement. *Cogent Bus Manag* 2024;11.
27. Yuwono H, Gunawan DR, Eliyana A, et al. Transformational leaders' approach to overcapacity: A study in correctional institutions. *PLoS One* 2022;17:e0276792.
28. Bogardus AJ, Neas BR, Sullivan SM. Practice differences between male and female oral and maxillofacial surgeons: Survey results and analysis. *J Oral Maxillofac Surg* 1999;57:1239-47.
29. Novotney A. Women leaders make work better: Here's the science behind how to promote them [Internet]. 2024 [cited 2024 Dec 3]. Available from: <https://www.apa.org/topics/women-girls/female-leaders-make-work-better>
30. Adikoeswanto D, Nurjanah S, Mukhtar S, et al. Fostering voice behavior in correctional institutions: Investigating the role of organizational support and proactive personality. *PLoS One* 2024;19:e0303768.
31. Saputra DEE, Rahma VM, Eliyana A, et al. Do system quality and information quality affect job performance? The mediation role of users' perceptions. *PLoS One* 2023;18:e0285293.
32. Harzif AK, Rahman MN, Mulawardhana P, et al. INCISION e-learning program as a useful teaching tool to enhance surgeons' knowledge and skills: An Indonesian multi-center cross-sectional pilot study. *F1000Research* 2018;7:1888.
33. Gharaei N, Ismail W, Grosan C, Hendradi R. Optimizing the setting of medical interactive rehabilitation assistant platform to improve the performance of the patients: A case study. *Artif Intell Med* 2021;120:102151.
34. Kademani D, Woo B, Ward B, et al. Oral/head and neck oncologic and reconstructive surgery fellowship training programs: transformation of the specialty from 2005 to 2015: report from the AAOMS Committee on Maxillofacial Oncology and Reconstructive Surgery. *J Oral Maxillofac Surg* 2016;74:2123-7.