

Plastic Surgery in the Gulf Cooperation Council Countries: Role of Telemedicine

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Background: Internationally, telemedicine is finding its way into common day plastic surgery practice as a result of the COVID-19 pandemic. Nonetheless, no data about its practice in the Gulf region are available to date.

Methodology: This is a cross-sectional survey-based study that was sent online to the plastic surgeons practicing in the Gulf region. The study aimed to look into the integration of telemedicine into the practice and the surgeons' attitude and future vision about it. Participation was voluntary, and confidentiality was preserved.

Results: A total of 229 plastic surgeons enrolled in this study in mid-2020. There were 192 male participants (83.8%) and 37 female participants (16.2%). Of these, 99 (43.2%) practiced in Saudi Arabia, 85 (37.1%) in the United Arab Emirates, 24 (10.5%) in Oman, 18 (7.9%) in Kuwait, and three (1.3%) in Bahrain. In total, 85 (37.1%) used telemedicine during lockdown, and 144 (62.9%) thought that its usage will remain beneficial in the future. There was no significant difference in practicing telemedicine in different plastic surgery subspecialties, varying level of experience, and country of practice. Among those who used virtual consultations, 62 (72.9%) did not charge for consultation fees.

Conclusion: The tendency toward telemedicine integration in plastic surgery practice is growing worldwide, especially after COVID-19. Its limitations are outweighed by its advantages and, with time, many of these will be bypassed. New innovations driven by advancement in technology will further embed telemedicine into the practice. (*Plast Reconstr Surg Glob Open* 2022;10:e4563; doi: 10.1097/GOX.0000000000004563; Published online 28 October 2022.)

INTRODUCTION

The year 2019 witnessed the emergence of COVID-19, which was labeled as a pandemic by the World Health Organization (WHO) on March 11, 2020 after extending to over 115 countries and infecting over 200,000 people.¹ Its consequences involved everyone, including plastic

surgeons who were obligated to adapt to the stringent restrictions implemented by the authorities. As a result, telemedicine, defined as real-time audiovisual, internet-based interaction between the patient and the physician,² became increasingly popular among plastic surgeons.

In 2020, Al Saud et al discussed the effect of the pandemic over the plastic surgeons across the Gulf Cooperation Council (GCC) countries and the different adaptation mechanisms in the aftermath of the lockdown. Ranging from taking no action and spending quarantine with family to financial rearrangement and devising plans for the "Post-pandemic era," telemedicine practice was an emerging trend among a substantial number of the cohort.³ Notwithstanding, little details were discussed about the practice of telemedicine in the article, although almost half of the surgeons incorporated online consultations into their practice. To cover this gap, this study aimed to assess the usage of online consultations through the pandemic and to review its advantages and disadvantages.

METHODOLOGY

In this cross-sectional, electronic-survey-based study, 233 plastic surgeons practicing in the Gulf region during May 2020 were invited via email to fill in a survey that

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Ethical considerations: This study conforms to the Declaration of Helsinki.

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explored the nature of COVID-19 impact on their practice, their attitude towards it, and the adaptation processes with the implemented restrictions. As part of the adaptation, we intended to examine their attitude toward incorporating telemedicine in plastic surgery practice. The survey was made in the English language and developed with the help of field experts; it was constructed using SurveyMonkey and was distributed across a duration of 2 weeks, starting April 29, through different national societies within the GCC countries. After briefing about the purpose of the study, it was stated that participation was voluntary, without any positive or negative consequences should they proceed to fill in the questionnaire or refrain from doing so. Furthermore, participants were informed that no identifying data will be published or accessed by a third party. Anonymity of the respondents was assured by assigning each participant a code number for the purpose of analysis only. Statistical analysis was conducted by SPSS (25th edition for Microsoft) after exporting data from an Excel sheet (Microsoft Corp, Redmond, Wash.). Descriptive statistics were expressed in values and percentages. Chi-square test was done to look for significant differences among categorical variables. A probability value of 0.05 was adapted for significance, and when multiple inter-group analyses were conducted, a Bonferroni correction was done to account for inflating risk of type I error.

RESULTS

A total of 229 plastic surgeons practicing in the Gulf region participated in this study after four participants were excluded due to missing answers. Of these, 192 were male participants (83.8%) and 37 were female participants (16.2%); the majority practiced in KSA and the United Arab Emirates ($N=99$, 43.2%; $N=85$, 37.1%, respectively) followed by Oman ($N=24$, 10.5%), Kuwait ($N=18$, 7.9%), and Bahrain ($N=3$, 1.3%). Most of the cohort were senior surgeons, practicing 10 years or more ($N=145$, 63.3%), while 50 practiced from 5 to 9 years (21.8%) and another 34 practiced less than five years (14.8%). Most of the surgeons were general plastic surgeons followed by cosmetic surgeons ($N=152$, 66.4%; $N=139$, 60.7%). Please refer to Table 1 for detailed demographic data.

Considering telemedicine practice, 33.3% of the plastic pediatric surgeons ($N=17/51$), 38.2% of the hand surgeons ($N=29/76$), 38.5% of the microsurgeons ($N=27/70$), 38.1% of the craniofacial surgeons ($N=8/21$), 46.5% of the breast surgeons ($N=33/71$), 39.2% of the burn surgeons ($N=29/74$), 37.5% of the general plastic surgeons ($N=57/152$), and 39.6% of the cosmetic surgeons ($N=55/139$) practiced virtual online consultation. There was no significant difference in the number of surgeons who practiced telemedicine and those who did not within each subspecialty, using chi-square test. Furthermore, there was no significant difference in practicing virtual consultations among different Gulf countries using the same test ($P=0.19$). Around 66.7%, 43.5%, 36.4%, 27.8%, and 20.8% of the surgeons practicing in Bahrain ($N=2/3$), United Arab Emirates ($N=37/85$), KSA ($N=36/99$), Kuwait ($N=5/18$), and Oman ($N=$

Takeaways

Question: How common is telemedicine practice among plastic surgeons in the Gulf region after COVID-19, and what is their view about its future use?

Findings: This cross-sectional online survey-based study shows that many plastic surgeons in the Gulf started to integrate telemedicine in their practice. A large percentage also think that its usage will continue in the future.

Meaning: Telemedicine, driven by COVID-19, is increasingly being used among plastic surgeons in the Gulf region.

Table 1. Demographic Data

Item	Number, %
Gender	Men: 192 (83.8%) Women: 37 (16.2%)
Country of practice	KSA: 99 (43.2%) UAE: 85 (37.1%) Oman: 24 (10.5%) Kuwait: 18 (7.9%) Bahrain: 3 (1.3%)
Duration of practice (y)	0–4: 34 (14.8%) 5–9: 50 (21.8%) 10 or more: 145 (63.3%)
Subspecialties*	General plastic: 152 (66.4%) Cosmetic: 139 (60.7%) Hand: 76 (33.2%) Burns: 74 (32.3%) Breast: 71 (31%) Microsurgery: 70 (30.6%) Pediatrics: 51 (22.3%) Craniofacial: 21 (9.2%)
Practice sector	Public: 53 (23.1%) Private: 106 (46.3%) Both: 70 (30.6%)
Private practice owner/ shareholder**	No: 128 (72.7%) Yes: 48 (27.3%)

*Participants were able to select more than one option.

**These values represent those who work in the private/ mixed sectors (Public and private).

KSA, Kingdom of Saudi Arabia; UAE, United Arab Emirates.

5/24) practiced telemedicine. Among those who did not incorporate telemedicine in their practice, 48 (33.3%) do not think that telemedicine would be useful following the pandemic, whereas 67 (46.5%) and 29 (20.1%) have a positive prospect or are unsure, respectively, if telemedicine practice will grow after the pandemic. In contrast, only six (7.1%) of the surgeons who practiced telemedicine disagreed that it would be useful after the pandemic, whereas 77 (90.6%) and two (2.4%) think that it will continue to be an asset or do not know, respectively, with a significant difference among the groups on chi-square test ($P < 0.001$ for all the groups). The probability value was adjusted using Bonferroni correction from 0.05 to 0.008 in the prior analysis to account for increased global type I error risk. There was no significant difference in the number of people who incorporated virtual consultations into their practice and those who did not among those whose private practice was completely affected by COVID-19 and the surgeons who sustained partial damage, using chi-square test ($P=0.12$). Moreover, there was

Table 2. Online Consultation Fees Based on Subspecialties

Subspecialty	Consultation Fees* (No., %)				
	Free	25%	50%	75%	Full
Pediatric	12 (70.6%)	1 (5.9%)	1 (5.9%)	3 (17.6%)	0 (0%)
Hand	20 (69%)	3 (10.3%)	3 (10.3%)	3 (10.3%)	0 (0%)
Microsurgery	20 (74.1%)	4 (14.8%)	3 (11.1%)	0 (0%)	0 (0%)
Craniofacial	3 (37.5%)	2 (25%)	0 (0%)	3 (37.5%)	0 (0%)
Breast	21 (63.6%)	1 (3%)	5 (15.2%)	5 (15.2%)	1 (3%)
Burn	24 (82.8%)	0 (0%)	1 (3.4%)	4 (13.8%)	0 (0%)
General plastic	43 (75.4%)	2 (3.5%)	2 (3.5%)	8 (14%)	2 (3.5%)
Cosmetic	39 (70.9%)	2 (3.6%)	4 (7.3%)	8 (14.5%)	2 (3.6%)
Overall**	62 (72.9%)	5 (5.9%)	6 (7.1%)	9 (10.6%)	3 (3.5%)

*This proportion is in relation to the original fees before the emergence of COVID-19.

**This row represents all the surgeons who used telemedicine in our cohort, regardless of the subspecialty.

Table 3. Attitude of Plastic Surgeons in the GCC toward Telemedicine during the Pandemic

Item	No., %
Extent of COVID-19 impact on private practice	Partially: 23 (13.1%) Completely: 152 (86.8%)
Did you incorporate telemedicine (virtual consultations) in your practice?	No: 144 (62.9%) Yes: 85 (37.1%)
Was telemedicine helpful during the pandemic?	No: 54 (23.6%) Yes: 144 (62.9%) Neutral: 31 (13.5%)
Is telemedicine going to be helpful after the pandemic?	No: 67 (29.3%) Yes: 122 (53.3%) Neutral: 40 (17.5%)

no significant difference in the number of surgeons who practiced telemedicine and those who did not when the public, private, and mixed practice ($P = 0.75$) and duration of practice were considered ($P = 0.68$). Likewise, there was no difference among the senior and junior surgeons in their view about the importance of telemedicine during or after the pandemic ($P = 0.22$ and $P = 0.81$, respectively). Table 2 shows the online consultation fees in relation to the original fees, and Table 3 shows the attitude of the surgeons toward telemedicine given the current circumstances.

DISCUSSION

In the pre-pandemic era, telemedicine had a variety of uses, albeit limited. Several applications are mentioned in the literature, such as postoperative follow-up, wound management, flap monitoring, avoiding unnecessary clinic visits, cutting down on costs, quicker response time to referral requests, improved triage decisions, surgical education, and access to specialist care in remote areas.⁴⁻⁹ COVID-19 markedly catalyzed the integration of telemedicine into plastic surgery practice. Salehi et al (2020) reported increased use of telemedicine among facial plastic surgeons in the United States in the aftermath of the pandemic.¹⁰ Xue et al elaborated on their experience in applying telemedicine in breast reconstruction starting from patient selection to postoperative follow-up.¹¹ Our study highlights the integration of telemedicine during the COVID-19 pandemic among plastic surgeons practicing in the Gulf region; it shows that around 37.1% of the sample practiced telemedicine.

Approximately 33.3% of our respondents believed that telemedicine would not be useful following the pandemic, albeit 7.1% of them are already practicing telemedicine during the pandemic. Different issues should be acknowledged before wide-spread implementation of telemedicine into common plastic surgery practice. Telecommunication infrastructure is vulnerable to natural disasters and other threats, and requires a backup plan. In addition, optimal patient-doctor rapport might be hindered by technical difficulties such as poor-quality video transmission. Also, certain aspects, such as burn depth, cannot be accurately determined on tele-examination, resulting in misjudgment, and it cannot completely replace hands-on training during residency or fellowship. Although telemedicine is useful in wound management, its role is limited in complex, ischemic, or deteriorating wounds. Moreover, modern technology arrived with different ethical dilemmas that should be addressed. Finally, personal security and patient privacy cannot be guaranteed with the expanded usage of technology.^{2,4,9,12-16}

That said, we believe that telemedicine practice will only grow among plastic surgeons in the post-pandemic era. Our data show that 46.6% of those who did not incorporate telemedicine in their practice during lockdown and 90.6% of those who used telemedicine think that its practice will continue to be an asset. A large proportion of the participants in the study by Joji et al planned to introduce telemedicine in their practice as the restrictive regulations in the United Kingdom were relaxed, but they did not mention if these were temporary measures or planned integration of audio and video consultations into the practice.¹⁷ However, the plastic surgeons in the study by Calderon et al reported that they will continue using telemedicine primarily for initial preoperative screening, routine postoperative follow-up, and unscheduled postoperative visits.⁹

About half (46.3%) of our respondents worked in the private sector alone when elective procedures were paused, putting them under financial strain. Al Saud et al (2020) reported that 45.7% of the plastic surgeons in their study expressed their apprehension about the financial implications consequent to the restrictions.³ Joji et al mentioned that all 101 plastic surgeons in their study experienced between 60% and 100% loss of their original income, with the full-time private working consultants who owned their business experiencing 100% reduction in their income.¹⁷ Although virtual consultations could have alleviated this pressure,¹⁸ the majority of our cohort did not benefit from this, as 72.9% did not charge fees for their online consultations. Although we do not know the reason for this interesting finding, we believe that a plastic surgeon's virtual consultation fee should not be less than 50% of his original in-clinic consultation fee. As the purpose of the consultation is obtaining expert opinion and not necessarily planning for the operation, since not all the patients attending the consultation will "convert." It is true that the expenses of having a patient-doctor consultation at a clinic will be factored out in a virtual consultation, but the patient will save time and money by cutting down on transportation

expenses and saving the trip-to-the-doctor time. The exception to this is charity in reconstructive cases.

Our study shows that there was no difference in using telemedicine among different subspecialties of plastic surgery. Moreover, there was no difference among younger and older surgeons. Finally, surgeons, regardless of their practice sector, extent of impact of private business, and geographic location within the GCC, practiced telemedicine on a similar proportion.

This study has many limitations. There is no baseline data on the implementation of telemedicine among plastic surgeons in the GCC in the “Pre-pandemic era”; hence, the extent to which the pandemic pushed toward adapting telemedicine is unknown. The American Telemedicine Association (ATA) developed standards and guidelines in using telemedicine.⁴ We believe that a similar model that is especially tailored to the GCC is required, taking into consideration the cultural and religious norms of the region. This study was based on a self-administered survey that was disseminated based on personal correspondence; therefore it is prone to bias. This study opens the door for potential research areas. Al Saud et al’s work and our work discussed telemedicine from the provider side. However, patients’ view on telemedicine is not investigated locally. Internationally, patients expressed their satisfaction with the virtual clinic; an example for this is the Cleft Team experience reported by Armstrong et al.¹⁹ Likewise, another study on pediatric plastic surgery patients reported the families’ experience with telemedicine in postoperative follow-up as “extremely positive.”²⁰

CONCLUSIONS

Difficult circumstances spur the need for adaptation, and the increasing shift toward including telemedicine in plastic surgery is no exception. Our study showed increased integration of telemedicine into the practice in the GCC, regardless of experience, practice scope, and country. It is probable that more reliance on modern technology will be the norm, with application of artificial intelligence on the rise in plastic surgery.

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