




COVID Pandemic Aftermath: Changing Dynamics on Cosmetic and Aesthetic Surgery Demands

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Abstract

Background After the WHO's announcement of the pandemic, the quarantine process started in the country. Suspension of elective surgeries was part of these measures. Having most of its cases as elective operations, plastic and aesthetic surgery became one of the branches most affected by the pandemic process. According to the annual statistical reports of the American Society of Plastic Surgeons, 2020 has been the first year in which a decline was experienced in the number of plastic surgery cases performed since the early 2000s. However, presumably, an increase in demand that occurred in the period after the restrictions was reported as well. In this study, we aim to analyze the role of the pandemic on this increased volume of cosmetic surgeries.

Methods Data about the number of cosmetic operations were collected from a multidisciplinary hospital, centrally located in Istanbul, Turkey. A prospective survey was conducted to question the sources of motivation of the patients who would undergo surgery.

Results A total of 95 (out of 118) patients fully completed the questionnaires. The number of cosmetic operations in the plastic surgery department of the hospital increased by 49.4% in 2021, compared to 2020, and increased by 29.7% compared to 2019. The number of operations in all disciplines increased by 33.4% in 2021, compared to 2020, and increased by 13.3% compared to 2019. The six most marked motivations were evaluated separately according to the types of surgery. Despite the variation due to the type

of the operations, “the desire to look better after the pandemic” was the leading reason for undergoing surgery with 46.3% (n = 44). It was also seen that the most significant motivation was “had cosmetic surgery before” with approximately 44.2% among the patients who had undergone cosmetic surgery.

Conclusions One of the branches most affected by the outcomes of COVID-19 in many aspects is plastic surgery. The wave of excessive demand following the great decline in the number of operations during the pandemic cannot be evaluated independently from the effects of the pandemic on individuals. Although some of the rules that the pandemic has brought to our lives have begun to lose their validity, social life virtualized and isolated by the ‘new normal’ will be affecting patients for years. At this point, it is of primary importance for plastic surgeons to understand the needs and concerns of patients in order to adapt to the changing patient demands.

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Introduction

The COVID-19 pandemic caused by the SARS-CoV-2 virus was observed for the first time in Wuhan, China in December 2019 [1]. After the WHO's announcement of the pandemic, the quarantine process started in the country as part of the measures taken to prevent the spread of the virus. Suspension of elective surgeries was part of these measures [1–4]. Having most of its cases as elective

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operations, plastic and aesthetic surgery became one of the branches most affected by the pandemic process.

According to the annual statistical reports of the American Society of Plastic Surgeons, 2020 has been the first year in which a decline was experienced in the number of plastic surgery cases performed since the early 2000s. The number of plastic surgery operations, which was stated as 18.4 million in the 2019 report, decreased by 15% to 15.6 million [5]. However, presumably, an increase in demand that occurred in the period after the restrictions was reported by the American Academy of Facial Plastic and Reconstructive Surgery. And the number of facial cosmetic operations of member surgeons of the association increased by 40% as of 2021 [6]. It was thought that this notable shift in the number of surgeries might be a result of a secondary patient profile that emerged in the pandemic period.

In this study, we aim to analyze the role of the pandemic on this increased volume of cosmetic surgeries. We also aimed to analyze the possible factors for this increase, to examine the dynamics shaped around the axis of the pandemic which might shed light on understanding the changing patient profiles in this period.

Materials and Methods

In order to examine the impact of COVID-19 on the demand for plastic surgery, data about the number of cosmetic operations were collected from a centrally located multidisciplinary hospital, where patients from many different nationalities are treated, in Istanbul, Turkey. A prospective survey was conducted to question the sources of motivation of the patients who would undergo surgery. The survey was completely anonymous, participants signed consent and the study protocol was compliant with the guidelines of the University Clinical Research Ethics Committee (Table 1).

The total number of cosmetic operations performed between December 1, 2019, and December 1, 2021, was included in the study. A questionnaire was prepared for patients who were admitted for cosmetic surgery and conducted between December 1, 2021, and May 1, 2022.

Except for the demographic information part (such as date of birth and gender), the questionnaire consisted of 3 main sections (Table 1). In the first section, the patients were asked whether they have had cosmetic surgery before. In the second section, patients were asked to state the date of their decision to have a cosmetic surgery. The third section was assembled to reflect the correlation between the pandemic and cosmetic surgery motivations. The section was prepared with the score-indexed answer system to evaluate the examined factors based on the criterion of

suitability for individuals. The patients were asked to rate the factors that best match—between 1 and 6 in accordance with a six-point Likert scale. The level of agreement was assessed for factors rated with 5 and 6 points, and the percentages in the graphs were created based on these criteria (Figs. 2, 3 and Tables 2, 3, 4). Following motivation factors were questioned in the survey: the frequency of looking in to the mirror and its change with the pandemic [1, 2], weight status and its change with the pandemic [3, 4], the use of social media and its change with the pandemic [5, 6], other's comments about the appearance and its change with the pandemic [7, 8], ratio of video meetings increasing with working at home [9], mask usage [10], desire to look better after the pandemic [11], undergoing a cosmetic surgery [12], being affected by the cosmetic procedure of a relative or close friend [13], and the desire to be admired by the others [14] (Table 1).

Statistical Analysis

Data were analyzed using SPSS (Statistical Package for the Social Sciences) version 25 (IBM Corp., Armonk, NY, USA). Whether the scores obtained from each continuous variable were normally distributed, data were analyzed using descriptive, graphical, and statistical methods. The Kolmogorov–Smirnov test was used to assess the normality of the scores obtained from a continuous variable with the statistical method. In addition to descriptive statistical methods (number, percentage, mean, median, standard deviation, etc.), Mann–Whitney U test and Kruskal Wallis–H test were used to calculate the correlation between the groups. Multiple comparisons were made with Bonferroni correction in groups where the difference in the Kruskal Wallis–H test result was found to be significant. Wilcoxon signed-ranks test was used to test the difference in repeated measurements. The results were evaluated at the 95% confidence interval and the significance level was $p < 0.05$.

Results

A total of 95 (out of 118) patients fully completed the questionnaires. Participants were excluded if they did not complete the survey or their decision time for surgery was before the pandemic, in order to avoid recall bias. The mean age was 43.60 ± 8.64 years (range: 22–62). 35.8% of the participants were 40 years old and younger, 35.8% were 41–50 years old, and 28.4% were 51 years old and older. Regarding the types of cosmetic surgeries, facial surgeries such as face lifting and blepharoplasty were performed in 40%, breast surgery in 31.6%, body contouring surgeries such as liposuction, abdominoplasty and brachioplasty in 17.9% and rhinoplasty in 10.5%. It was

Table 1 A prospective survey was conducted to question the sources of motivation of the patients who would undergo surgery

Gender:	
Date of birth:	
Educational status:	
Country you live in:	
Have you undergone previous cosmetic surgery?	Yes (...) No (...)
When did you decide to have the surgery?	Before March 2020 (...) After March 2020 (...)
Please rate the reasons mentioned below considering your motivation to undergo cosmetic surgery	
1. Increased frequency of checking yourself in the mirror since the beginning of the pandemic and therefore bothered by your appearance more than before	1(...) 2(...) 3(...) 4(...) 5(...) 6(...)
2. Feeling irritated by your appearance in the mirror long before the pandemic already	1(...) 2(...) 3(...) 4(...) 5(...) 6(...)
3. Gaining weight during the pandemic and therefore bothered by your body shape more than before	1(...) 2(...) 3(...) 4(...) 5(...) 6(...)
4. Complaining by your body shape and weight long before the pandemic already	1(...) 2(...) 3(...) 4(...) 5(...) 6(...)
5. Increased time spent on social media since the beginning of the pandemic and therefore bothered by your appearance more than before	1(...) 2(...) 3(...) 4(...) 5(...) 6(...)
6. Bothered by your appearance long before the pandemic due to time spent on social media	1(...) 2(...) 3(...) 4(...) 5(...) 6(...)
7. People you were quarantined with commenting on your physical features more frequently than before	1(...) 2(...) 3(...) 4(...) 5(...) 6(...)
8. People commenting on your physical features long before the pandemic already	1(...) 2(...) 3(...) 4(...) 5(...) 6(...)
9. Noticing some physical features you are not happy with on camera during video meetings (Zoom, Teams, etc.) you participated during the pandemic	1(...) 2(...) 3(...) 4(...) 5(...) 6(...)
10. Feeling more confident in public while wearing a mask	1(...) 2(...) 3(...) 4(...) 5(...) 6(...)
11. Desire to look better after the pandemic	1(...) 2(...) 3(...) 4(...) 5(...) 6(...)
12. Increased desire to change after a previous cosmetic surgery	1(...) 2(...) 3(...) 4(...) 5(...) 6(...)
13. Observing the change of a friend or a celebrity after having a cosmetic operation and envying them	1(...) 2(...) 3(...) 4(...) 5(...) 6(...)
14. Desire to be admired by others	1(...) 2(...) 3(...) 4(...) 5(...) 6(...)

found that 54.7% of the participants had a cosmetic procedure beforehand (Table 2).

The number of cosmetic operations in the plastic, aesthetic and reconstructive surgery department of the hospital increased by 49.4% in 2021, compared to 2020, and increased by 29.7% compared to 2019. The number of operations in all disciplines increased by 33.4% in 2021, compared to 2020, and increased by 13.3% compared to 2019 (Fig. 1).

Agreement level was created based on the items marked as 1–6 according to the six-point Likert scale. The six most marked motivations were evaluated separately according to the types of surgery. Despite the variation due to the type of the operations, “the desire to look better after the

pandemic” was the leading reason for undergoing surgery with 46.3% (n = 44) (Fig. 2).

It was also seen that the most significant motivation was “had cosmetic surgery before” with approximately 44.2% among the patients who had undergone cosmetic surgery. This finding is followed by the motivation of “the desire to look better after the pandemic” which was found as the most marked factor in general (Fig. 3).

It was observed that the motivation level of the participants who underwent facial, body contouring and rhinoplasty surgery for “bothered by their appearance in the mirror” was statistically significantly lower during the pandemic period compared to the pre-pandemic period

Table 2 A total of 95 (out of 118) patients fully completed the questionnaires

Characteristics	n (%)	Mean \pm SD	Min–Max
Patient age, years	95 (100)	43.60 \pm 8.64	22–62
Age group			
\leq 40	34 (35.8)		
41–50	34 (35.8)		
\geq 51	27 (28.4)		
Previous cosmetic surgery			
Yes	52 (54.7)		
No	43 (45.3)		
Cosmetic surgery type			
Facial surgery	38 (40)		
Breast surgery	30 (31.6)		
Body contouring surgery	17 (17.9)		
Rhinoplasty	10 (10.5)		

The mean age was 43.60 \pm 8.64 years (range: 22–62). 35.8% of the participants were 40 years old and younger, 35.8% were 41–50 years old, and 28.4% were 51 years old and older.

SD, standard deviation

(Facial $\rightarrow p = 0.003$, body contouring $\rightarrow p = 0.018$ and rhinoplasty $\rightarrow p = 0.020$) (Table 3).

In the pre-pandemic period, it was found that the motivation level of “complaining about the body shape” showed variation statistically according to the type of surgery performed on participants ($K-W\chi^2 = 24.820$; $p < 0.001$). According to the Bonferroni test results, it was detected that this difference was between the participant group who underwent body contouring surgery and the participant group who underwent the other surgeries. From this finding, it was seen that the participants who had body contouring surgery had a higher motivation level for complaining about their body shape in the pre-pandemic period. In addition, it was determined that the motivation level of “complaining about the body shape” of the participants who underwent body contouring surgery was statistically significantly lower during the pandemic period compared to the pre-pandemic period ($Z = -2.061$; $p = 0.039$) (Table 3).

According to the Bonferroni test results, the motivation level of “bothered by their appearance during video meetings” showed a statistically significant difference between the facial surgery group and the others ($K-W\chi^2 = 9400$; $p = 0.024$). Thus, it was observed that participants who had facial surgery were annoyed by seeing themselves in video meetings in comparison with the other groups (Table 3).

It was observed that the motivation level of “felt more confident while wearing a mask” showed a statistically

significant difference between the rhinoplasty group and the others ($KW\chi^2 = 15.084$; $p = 0.002$). The motivation level to “felt more confident while wearing a mask” was due to the participant group who underwent rhinoplasty (Table 3). In addition, the motivation of feeling more comfortable while wearing masks scored the highest overall among the rhinoplasty patients in contrast with the total patient group (Table 4).

Discussion

It is an undeniable fact that COVID-19 has caused unprecedented problems not only in the field of health but also all over the world. The pandemic introduced new concepts such as masks, isolation and working from home. These changes have diverse effects on our societies from both psychological and social perspectives [7]. Over the years, many studies have been conducted on the effect of changing dynamics on the demand for plastic surgery in various different fields including demographics, economics, psychological factors and market trends [8–11]. Being a major shift in our daily lives, isolated living conditions brought by the long pandemic period were undoubtedly expected to affect the demand for plastic surgery.

Plastic surgery was the second surgical discipline in which the number of cases decreased the most at the beginning of the pandemic era [12]. And it is now in a peerless increasing trend. No doubt, rescheduling elective surgeries worldwide affected the upcoming patient load. However, as Sezgin et al pointed out a secondary patient group would also emerge due to the pandemic period itself [2]. In this paper, we aimed to find out if this global data would correlate with our numbers. In this study, as of 2021, the rate of cosmetic surgeries performed showed a 49.4% increase compared to 2020, whereas the rate of total surgeries increased by only 33.4%.

The reasons behind this difference were studied by much research during the pandemic. Most of the research was based on public survey data [13, 14], where this study examined the pandemic-related motivations directly of the patient group who had surgery, with emphasis on clinical observations.

Evaluating our data, it was seen that the most important motivation for patients undergoing cosmetic surgery was “the desire to look better after the pandemic”. In parallel to this finding, the fact that 3 of the top 5 most marked motivations were related to the pandemic showed us how remarkably effective the pandemic and social isolation were on people’s lives. The other two were ‘felt more confident while wearing a mask’ and ‘bothered by their

Table 3 Motivation level of the participants who underwent facial, body contouring and rhinoplasty surgery for “bothered by their appearance in the mirror” was statistically significantly lower during the pandemic period compared to the pre-pandemic period (Facial → $p = 0.003$, body contouring → $p = 0.018$ and rhinoplasty → $p = 0.020$)

Motivation factors	Time	Cosmetic surgery type				<i>K-W</i> χ ²	<i>p</i> value	dif.**
		Facial (<i>n</i> = 38) Mean ± SD	Breast (<i>n</i> = 30) Mean ± SD	Body contouring (<i>n</i> = 17) Mean ± SD	Rhinoplasty (<i>n</i> = 10) Mean ± SD			
Bothered by their appearance in mirror	Before	3.03 ± 2.27	2.77 ± 2.22	4.29 ± 2.05	3.80 ± 2.49	5.197	0.158	
	pandemic	1.63 ± 1.48	2.53 ± 2.18	2.18 ± 2.19	1.00 ± 0.00	6.808	0.078	
	Pandemic							
	<i>Z</i>	- 2.940	- 0.582	- 2.363	- 2.333			
	<i>p</i> value	0.003*	0.561	0.018*	0.020*			
Complaining about body shape	Before	1.47 ± 1.31	1.47 ± 1.33	3.88 ± 2.21	2.00 ± 2.11	24.820	< 0.001*	3>1,2,4
	pandemic	1.47 ± 1.33	1.57 ± 1.50	2.35 ± 2.03	1.70 ± 1.64	4.472	0.215	
	Pandemic							
	<i>Z</i>	- 0.412	- 0.271	- 2.061	- 1.000			
	<i>p</i> value	0.680	0.786	0.039*	0.317			
Social media effect	Before	1.68 ± 1.53	1.50 ± 1.17	1.00 ± 0.00	2.60 ± 2.17	7.539	0.057	
	pandemic	1.47 ± 1.29	1.23 ± 0.63	1.06 ± 0.24	2.30 ± 2.16	3.780	0.286	
	Pandemic							
	<i>Z</i>	- 1.134	- 1.342	- 1.000	- 0.272			
	<i>p</i> value	0.257	0.180	0.317	0.785			
Comments of acquaintances	Before	1.47 ± 1.13	1.60 ± 1.45	1.53 ± 1.33	2.30 ± 2.16	1.508	0.681	
	pandemic	1.74 ± 1.54	1.57 ± 1.17	1.65 ± 1.22	1.50 ± 1.58	0.719	0.869	
	Pandemic							
	<i>Z</i>	- 1.134	- 0.089	- 0.514	- 0.756			
	<i>p</i> value	0.257	0.929	0.607	0.450			
Bothered by their appearance during video meetings	All	2.32 ± 1.88	1.37 ± 1.16	1.29 ± 1.21	1.90 ± 1.91	9.400	0.024*	1>2,3
Felt more confident while wearing masks	All	2.79 ± 2.12	1.70 ± 1.56	1.53 ± 1.51	4.10 ± 2.33	15.084	0.002*	4>2,3
Desire to look better after pandemic	All	3.79 ± 2.22	2.83 ± 2.34	3.18 ± 2.40	3.50 ± 2.46	2.457	0.483	
Had cosmetic surgery before (<i>n</i> =52)	All	3.50 ± 2.26	3.94 ± 2.41	3.00 ± 2.26	3.50 ± 0.71	1.400	0.706	
Inspired by other's cosmetic surgeries	All	1.74 ± 1.37	1.77 ± 1.61	2.12 ± 1.97	1.90 ± 1.91	0.380	0.944	
Desire to be admired by others	All	1.39 ± 1.24	1.00 ± 0.00	1.00 ± 0.00	1.90 ± 1.91	7.452	0.059	

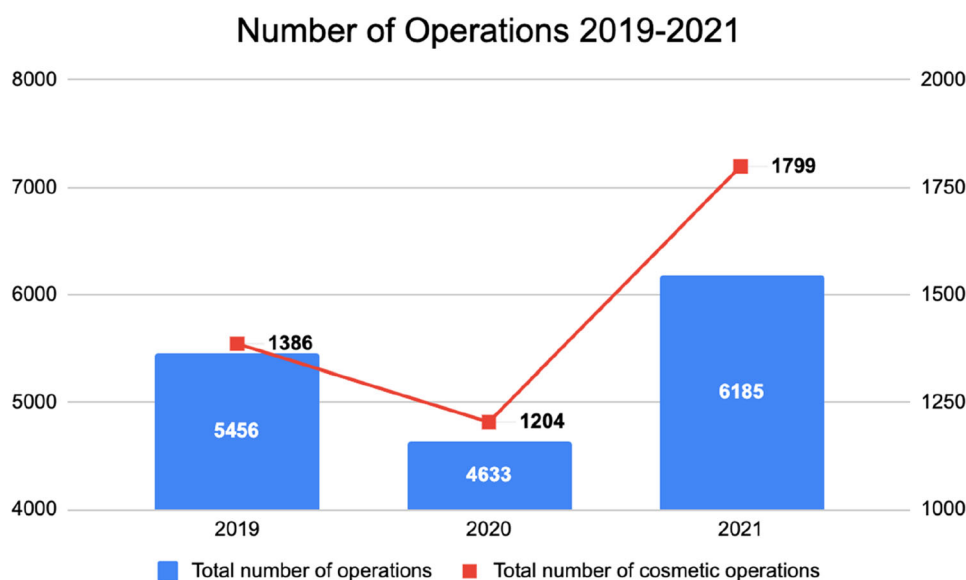
Italics show data analyzed by using SPSS.

Bolditalics show statistically significant values ($p < 0.05$)

Table 4 The motivation of feeling more comfortable while wearing masks scored the highest overall among the rhinoplasty patients in contrast with the total patient group

Motivation factors	Facial (%)	Breast (%)	Body (%)	Rhinoplasty (%)	Total (%)
Desire to look better after pandemic	52.60	36.70	47.10	50.00	46.30
Bothered by their appearance long before pandemic	34.20	30.00	52.90	50.00	37.90
Felt more confident while wearing masks	31.60	13.30	11.80	60.00	25.30
Complaining about body shape long before pandemic	5.30	6.70	47.10	20.00	14.70
Bothered by their appearance during video meetings	23.70	6.70	5.90	20.00	14.70
Inspired by other's cosmetic surgeries	7.90	10.00	17.60	20.00	11.60

Fig. 1. The total number of cosmetic operations performed between December 1, 2019, and December 1, 2021, included in the study



Motivation Factors by Type of Surgery

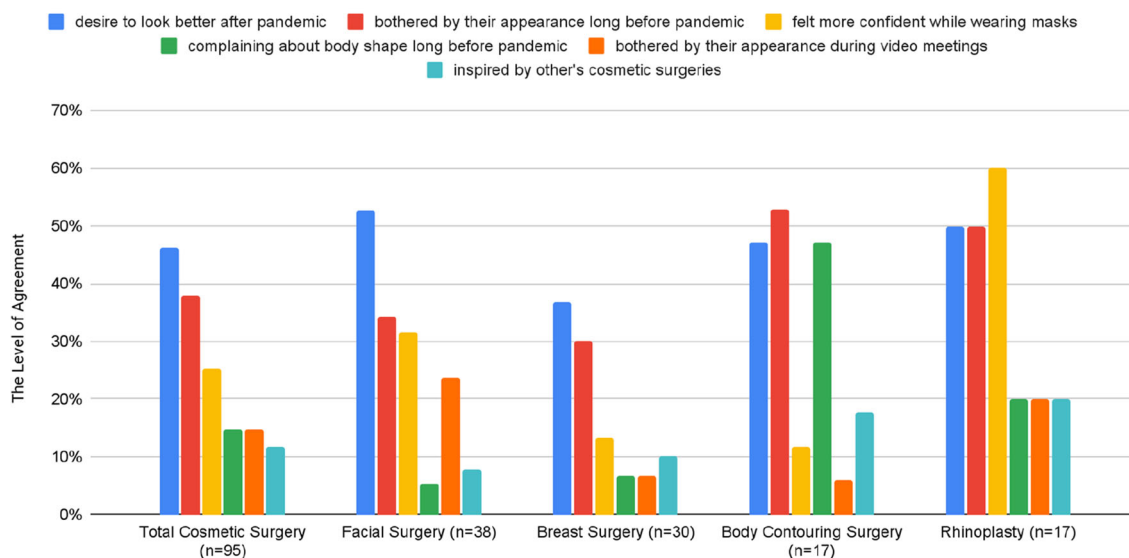


Fig. 2. Motivation factors by type of surgery. Agreement level was created based on the items marked as 1–6 according to the six-point Likert scale. The 6 most marked motivations were evaluated separately according to the types of surgery. Despite the variation

due to the type of the operations, “the desire to look better after the pandemic” was the leading reason for undergoing surgery with 46.3% ($n = 44$)

appearance during video meetings’, respectively (Fig. 2, Table 4).

However, the aforementioned motivations have not been applied similarly to patients undergoing different types of cosmetic surgeries. Analyzing rhinoplasty patients alone, it was observed that the use of masks impacted their surgery motivation more compared to the other groups ($KW\chi^2 = 15,084$; $p = 0.002$) (Table 3). In fact, despite not being one of the motivations included in similar surveys, ‘mask use’ has been the most important motivation factor for patients undergoing rhinoplasty. Considering that

rhinoplasty is the most popular type of cosmetic surgery in recent years [5], it might worth to draw attention to the importance of such motivation factors.

Findings also indicate that the ‘bothered by their appearance during video meetings’ is more effective for patients undergoing facial surgery compared to other groups ($K-W\chi^2 = 9400$; $p = 0.024$) (Table 3). Data showed that, during the pandemic, remote working increased by 51% in the USA [15], and in 2020, people used video meetings 60% more than pre-COVID-19 period [16]. Chen et al, in their 2021 study, found a relationship between the

Motivation Factors of Patients Who Had Undergone Cosmetic Operation Before (n=52)

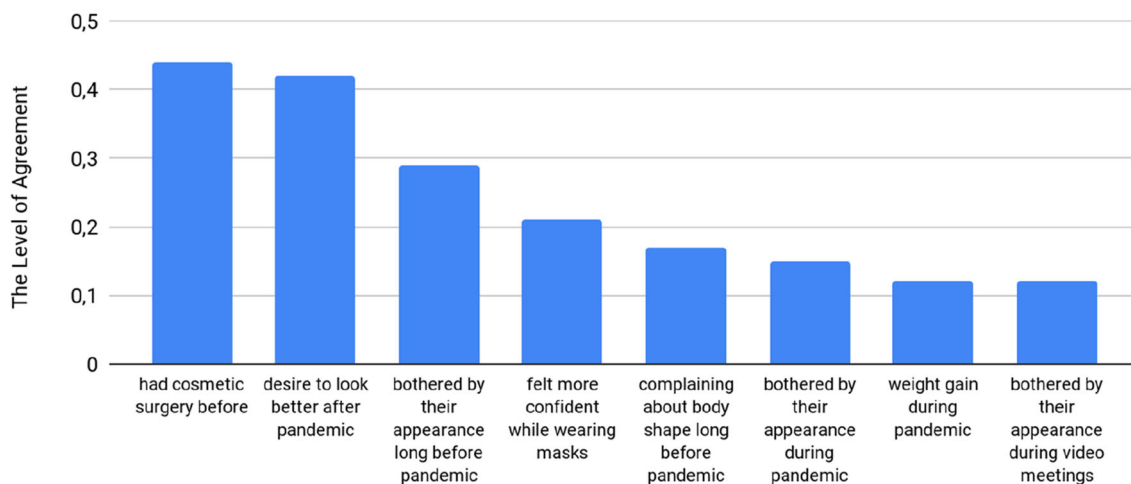


Fig. 3. Motivation factors of patients who had undergone cosmetic surgery before. It was also seen that the most significant motivation was “had cosmetic surgery before” with approximately 44.2% among

increase in the time spent in video meeting applications, especially on Zoom, and the tendency to desire to have plastic surgery [14]. Similarly, Pikoos et al stated that over one-third of participants had identified certain concerns about their new appearance while they are on video calls [17]. It should also be noted that slightly distorted images presented by front cameras might be another reason for these concerns [18]. Since it is an area of great interest in many recent studies, more clinical data are supposed to be revealed in the upcoming years.

All in all, the three motivations listed above are considered to be crucial while interpreting patients’ needs. It might be feasible to imply that these findings may help the clinician to understand the mood and mentality of their patients. These new considerations have transformed our lives for the past two years and are supposed to do so.

When the results are evaluated separately for the group who had undergone cosmetic surgery before, the fact that the most marked motivation factor was ‘previous surgery’ is a remarkable finding that has not been included in the literature before (Fig. 3). This motivation factor may have been caused by people being very satisfied with the results, or them being constantly unhappy with their appearance. Therefore, further studies are needed to be done to clarify the underlying causes.

One of the strengths of the study is that it is one of the few studies that directly examine the rising number of patients who underwent cosmetic surgery. Despite the study’s strengths, the study is not without its limitations. For instance, the lack of heterogeneity in this study is not in line with the general statistics [5, 19], and it is suggested to

the patients who had undergone cosmetic surgery. This finding is followed by the motivation of “the desire to look better after the pandemic” which was found as the most marked factor in general

be studied in the mixed-sex groups as well. One of the other major limitations of the study was that it was conducted at a time while most of the population was vaccinated, and the pandemic restrictions were almost over. Nonetheless, the high rate of marking of COVID-related motivations reveals the necessity of individualizing the impact of global issues such as pandemics on patient psychology with multifactorial approaches.

Conclusion

One of the branches most affected by the outcomes of COVID-19 in many aspects is plastic surgery. The wave of excessive demand following the great decline in the number of operations during the pandemic cannot be evaluated independently from the effects of the pandemic on individuals.

Although some of the rules that the pandemic has brought to our lives have begun to lose their validity, social life virtualized and isolated by the ‘new normal’ will be affecting patients for years. At this point, it is of primary importance for plastic surgeons to understand the needs and concerns of patients in order to adapt to the changing patient demands. This understanding might guide plastic surgeons in their future practice.

Declarations

Conflict of interest The authors declare that they have no conflicts of interest to disclose.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent All participants give their informed consent in writing prior to inclusion in the study.

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