Original Article :

Perceptions and Trends in Cosmetic Procedures: Assessing Knowledge and Attitudes Among Saudi Population

Abdullah S Algarni[1], Latifah A Albash[2], Shahad A Alshehri[3], Nasser A Almulhim[2], Mohammed K Alghamdi[4], Renad FAlharthy[5], Alaa J Alshawi[6], Omnia A Alali[7], Ramy Samargandi[8], Safinaz M Alshiakh[9]

1.Department of Medicine, College of Medicine, University of Jeddah, Jeddah, Saudi Arabia.

2.College of Medicine, King Faisal University, Hafuf, Saudi Arabia.

3.College of Medicine, University of Jeddah, Jeddah, Saudi Arabia.

4.Emergency Department, King Abdulaziz Hospital, Jeddah First Health Cluster, Jeddah, Saudi Arabia.

5.College of Medicine, King Saud Bin Abdulaziz University for Health Sciences, Jeddah, Saudi Arabia.

6.College of Medicine, Ibn Sina National College, Jeddah, Saudi Arabia.

7.College of Medicine, University of Tabuk, Tabuk, Saudi Arabia

8.Department of Surgery, College of Medicine, University of Jeddah, Jeddah, Saudi Arabia.

9.Department of Emergency Medicine, Faculty of Medicine, King Abdulaziz University, Jeddah, Saudi Arabia

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Corresponding Author:

Safinaz Alshiakh, Clinical Assistant Professor of Emergency Medicine, Department of Emergency Medicine Jeddah, King Abdulaziz University, Email : alshaikh@kau.edu.sa

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Abstract

Background and Aims:
Cosmetic procedures are increasingly common worldwide, including in Saudi Arabia. Understanding public perceptions is crucial to guide healthcare professionals in addressing awareness and ethical concerns. This study aims to assess the knowledge, attitudes, and acceptance of cosmetic treatments among the Saudi population.

Methods:
A descriptive cross-sectional study was conducted using an online self-reported questionnaire. A total of 408 participants aged 18 and above were randomly selected from across Saudi Arabia.

Results:
Among respondents, 60.3% had considered undergoing cosmetic procedures. The most popular treatments were Botox (62.5%) and laser hair removal (61.8%). Women (69.2%) were significantly more likely than men (35.8%) to consider cosmetic treatments, with the highest interest observed in the 25–34 age group (67.6%). Overall, 40.9% had undergone at least one procedure, with laser hair removal being the most common (55.1%). Dissatisfaction with outcomes was reported by 45.8%, while 75.0% acknowledged associated risks. Ethical concerns were expressed by 23.0% of participants, and 85.8% believed cosmetic procedures are becoming more socially accepted.

Conclusion:
There is a growing interest in non-surgical cosmetic procedures among Saudis, particularly among young adults and women. Despite increased social acceptance, the high rate of dissatisfaction and ethical concerns underscores the need for better patient education and risk communication to support informed decision-making.

Keywords:
aesthetic; cosmetic; laser; procedures; stigma; Saudi Arabia; cross-sectional studies

Introduction:

Cosmetic procedures, often categorized as aesthetic enhancements, are now among the most commonly performed medical interventions. Their popularity has risen significantly due to factors such as body image dissatisfaction, the pursuit of perfection, and the increasing influence of social media[1]. Additionally, physician-related factors, including years of experience, board certification, and reputation, also influence individuals' decisions to undergo cosmetic treatments. Historically, aesthetic procedures were primarily used for reconstructive purposes, such as facial reconstruction and the treatment of congenital deformities. However, the emergence of minimally invasive techniques has contributed to the mainstream appeal of cosmetic enhancements[2]. Cosmetic procedures are categorized into surgical and non-surgical treatments. Surgical procedures include rhinoplasty, liposuction, breast augmentation, and facelifts. At the same time, non-surgical options involve laser skin resurfacing, chemical peels, dermal fillers, vein removal, and botulinum toxin injections[3]. Non-surgical procedures such as laser hair removal have gained popularity due to their lower risk, shorter recovery time, and affordability, making them widely accepted across different age groups[1].

The global popularity of cosmetic procedures has surged over recent decades, as highlighted by reports from the American Society of Plastic Surgeons (ASPS, 2020). A study in the Netherlands reported an increase in injectable treatments among individuals aged 18 to 25 years[4]. Psychological factors such as body dissatisfaction, appearance orientation, and personal experiences with cosmetic procedures significantly influence treatment decisions[5,7].

In Saudi Arabia, the growing beauty industry and evolving societal norms have contributed to the increasing demand for cosmetic procedures[3]. Several epidemiological factors contribute to the growing interest in cosmetic procedures. Individuals with higher household incomes, lower levels of education, and greater exposure to media-driven beauty standards are more likely to undergo aesthetic treatments[9]. Younger adults, particularly women, show a strong inclination toward cosmetic enhancements. A study in western Saudi Arabia found that around 40% of participants, primarily young, single women, had an adequate understanding of cosmetic procedures, largely influenced by social media[10]. Similarly, a study conducted in Majmaah, Saudi Arabia, found that most participants had poor to intermediate knowledge of cosmetics. Social media was the primary source of information, indicating growing societal acceptance[3]. The acceptance of cosmetic procedures varies across regions and demographics. A study in western Saudi Arabia found that 54% of participants approved of cosmetic surgery, while 46% were disapproving[11]. Laser surgery, filler, and Botox were the most frequently per-

formed procedures. Despite increasing acceptance, concerns about safety and ethical implications persist. Understanding public perceptions and addressing knowledge gaps can help healthcare providers better cater to patient needs.

Social media plays a significant role in shaping attitudes toward cosmetic procedures. Highly visual platforms like Instagram contribute to the normalization of aesthetic enhancements. Studies show that both passive and active engagement with social media, including viewing celebrity content, correlates with increased interest in aesthetic treatments[12,13]. Research further indicates that exposure to appearance-related content significantly impacts body image concerns and increases cosmetic surgery intentions compared to non-appearance-focused media[10,14]. Influencers who undergo cosmetic procedures often act as role models, encouraging their followers to consider aesthetic enhancements. This effect is especially pronounced among young adults who experience wishful identification—the aspiration to resemble influencers[15,16].

Given the rising demand for cosmetic procedures and the influence of social media on beauty standards, it is crucial to explore public awareness and attitudes toward these treatments. Understanding societal perceptions can help healthcare professionals develop effective patient education programs, implement stricter safety regulations, and ensure ethical medical practices. This study evaluates the knowledge, attitudes, and acceptance of cosmetic procedures in the Saudi population, addressing existing knowledge gaps and providing valuable insights for medical professionals and policymakers.

Methods:

Study Design:

A descriptive cross-sectional study was conducted in 2024 to evaluate the knowledge and attitudes of the general Saudi population toward dermatological cosmetic procedures. Participants included individuals who had undergone, were considering, or had no interest in such procedures. Eligibility criteria required voluntary participation from Saudi residents aged 18 and older, while non-residents and those unwilling to participate were excluded. This study was approved by the biomedical ethical committee at the University of Jeddah, Jeddah, Saudi Arabia (IRB.no.UJ-REC-247).

The sample size was determined using the Qualtrics calculator, estimating a minimum of 385 participants with a 95% confidence level and a 5% margin of error.

A previously validated questionnaire, used with permission from the original authors, was adapted for this study to align

with the target population[17]. To ensure its relevance and applicability, a pilot test was conducted with a small representative sample. The questionnaire was administered via Google Forms (Alphabet Inc., Mountain View, CA) and distributed through social media platforms. Informed consent was obtained at the beginning of the survey, assuring participants of the confidentiality of their responses. Data collection took place between June and August 2024. The survey covered demographic details and participant perspectives on various cosmetic procedures, including fillers, Botox, laser treatments, and other aesthetic interventions.

Statistical Analysis:

Descriptive statistics summarized data using frequencies and percentages for categorical variables and means, standard deviations, medians, and interquartile ranges (IQR) for continuous variables. Fisher's exact test evaluated categorical associations, while the Mann-Whitney U test compared continuous variables. A p-value <0.05 indicated statistical significance. Analyses were conducted using IBM Statistical Package for Social Science (SPSS) Version 27.

Results:

The study included 408 participants, with the majority being female (n = 299, 73.3%), single (n = 211, 51.7%), and Saudi citizens (n = 383, 93.9%). The predominant age group was 18-24 years (n = 159, 39%), as shown in Table 1.

Table 1: Demographic data of the enrolled participants in the study (n=408) .

		n	%
Gender	Female	299	73.3%
	Male	109	26.7%
Nationality	Non-Saudi	25	6.1%
	Saudi	383	93.9%
Age	18-24	159	39.0%
	25-34	102	25.0%
	35-44	61	15.0%
	45-54	52	12.7%
	55-64	32	7.8%
	and over 65	2	0.5%
Marital status	Single	211	51.7%
	Married	171	41.9%
	Divorced	21	5.1%
	Widow	5	1.2%
Educational level	Bachelor's degree	249	61.0%
	Diploma degree	39	9.6%
	High school and below	80	19.6%
	Postgraduate studies (Masters, PhD)	40	9.8%
Residence area	Central Region	36	8.8%
	Eastern Region	127	31.1%
	Northern Region	70	17.2%
	Southern region	7	1.7%
	Western Region	168	41.2%
Have you ever thought about having cosmetic proce-?dures or surgeries	No	162	39.7%
	Yes	246	60.3%
If yes, which area of your body considering having cosmetic procedures (n=246)	Face	136	55.3%
	Lips	96	39.0%
	Nose	95	38.6%
	Neck	51	20.7%
	Scalp	44	17.9%
	Arm	41	16.7%
	Underarm	41	16.7%
	Thighs	31	12.6%
	Belly	10	4.1%
	Breast	2	0.8%
	Feet	1	0.4%
	Forehead	1	0.4%
	Ears	1	0.4%

Participants with a bachelor's degree represented the largest group undergoing cosmetic procedures (n=249, 61%), while those with a diploma (n=39, 9.6%) and PhD (n=40, 9.8%) were the least represented Table 1. Additionally, the highest number of participants resided in the Western Region (n = 168, 41.2%). Approximately 60.3% (n = 246) had considered cosmetic procedures or surgeries, with the face being the most targeted area (n = 136, 55.3%), followed by the lips (n = 96, 39.0%) and nose (n = 95, 38.6%). Among all these demographic variables, there were no statistically significant differences between them (P>0.05).

Our analysis revealed notable differences between men and women regarding past experiences with and future considerations of cosmetic procedures. Women were significantly more likely than men to consider undergoing cosmetic procedures (69.2% vs. 35.8%, p < 0.001). Interest was highest among individuals aged 25–34 (n = 69, 67.6%) and lowest among those aged 55–64 (n = 11, 34.4%, p = 0.005). Similarly, women were more likely than men to have already undergone cosmetic procedures (46.5% vs. 25.7%, p < 0.001). The highest rates of completed procedures were observed among participants aged 25–34 (n = 58, 56.9%) and 35–44 (n = 36, 59.0%), whereas the lowest rates were found in the 18–24 and 55–64 age groups (p < 0.001). This is depicted in Table 2.

Table 2:The association between demographic data and participants' engagement in cosmetic procedures

		Have you ever thought about having cosmetic procedures or surgeries?			In the past, have you had any cosmetic procedures?		
		No	Yes	P value	No	Yes	P value
		n (%)	n (%)		n (%)	n (%)	
Gender	Female	92 (30.8%)	207 (69.2%)	<0.001*	160 (53.5%)	139 (46.5%)	<0.001*
	Male	70 (64.2%)	39 (35.8%)		81 (74.3%)	28 (25.7%)	
Nationality	Non-Saudi	12 (48%)	13 (52.0%)	0.404	15 (60%)	10 (40%)	1.000
	Saudi	150 (39.2%)	233 (60.8%)		226 (59%)	157 (41%)	
Age	18-24	67 (42.1%)	92 (57.9%)	0.005*	113 (71.1%)	46 (28.9%)	<0.001*
	25-34	33 (32.4%)	69 (67.6%)		44 (43.1%)	58 (56.9%)	
	35-44	19 (31.1%)	42 (68.9%)		25 (41%)	36 (59.0)	
	45-54	20 (38.5%)	32 (61.5%)		33 (63.5%)	19 (36.5%)	
	55-64	21 (65.6%)	11 (34.4%)		24 (75%)	8 (25%)	
	65 and over	2 (100%)	0 (0%)		2 (100%)	0 (0%)	
Marital status	Single	93 (44.1%)	118 (55.9%)	0.149	143 [67.8%)	68 (32.2%)	<0.001*
	Married	60 (35.1%)	111 (64.9%)		89 (52.0%)	82 (48%)	
	Divorced	6 (28.6%)	15 (71.4%)		6 (28.6%)	15 (71.4%)	
	Widow	3 (60.0%)	2 (40%)		3 (60%)	2 (40%)	

Educational level	Bachelor's degree	88 (35.3%)	161 (64.7%)	0.151	137 (55%)	112 (45.0%)	0.005*
	Diploma degree	19 (48.7%)	20 (51.3%)		25 (64.1%)	14 (35.9%)	
	High school and below	37 (46.3%)	43 (53.8%)		60 (75%)	20 (25%)	
	Postgraduate studies (Masters, PhD)	18 (45%)	22 (55%)		19 (47.5%)	21 (52.5%)	
Residence area	Central Region	15 (41.7%)	21 (58.3%)	<0.001*	21 (58.3%)	15 (41.7%)	0.071
	Eastern Region	52 (40.9%)	75 (59.1%)		73 (57.5%)	54 (42.5%)	
	Northern Region	13 (18.6%)	57 (81.4%)		32 (45.7%)	38 (54.3%)	
	Southern region	3 (42.9%)	4 (57.1%)		5 (71.4%)	2 (28.6%)	
	Western Region	79 (47.0%)	89 (53.0%)		110 (65.5%)	58 (34.5%)	
In the past, have you had any cosmetic procedures?	No	138 (57.3%)	103 (42.7%)	<0.001*	138 (85.2%)	24 (14.8%)	<0.001*
	Yes	24 (14.4%)	143 (85.6%)		103 (41.9%)	143 (58.9%)	
Have you ever thought about having cosmetic procedures or surgeries?	No				138 (85.2%)	24 (14.8%)	<0.001*
	Yes				103 (41.9%)	143 (58.9%)	

*p<0.05, Significant

Marital status also influenced cosmetic procedure rates, with divorced participants showing the highest rate (n = 15, 71.4%), followed by married individuals (n = 11, 48.0%), and single individuals (32.2%, p < 0.001) (Table 2). Education level was another significant factor, as postgraduates had a higher likelihood of undergoing procedures (52.5%, n = 21) compared to those with a high school education or lower (25%, n = 20, p = 0.005). Prior consideration of cosmetic procedures significantly influenced participation, with 58.9% (n = 143) of those who had previously considered undergoing a procedure following through, compared to just 14.8% (n = 24)

of those who had not (p < 0.001) (Table 2).

Regional differences were also notable, with the highest interest in cosmetic procedures observed in the Northern Region (n = 57, 81.4%), followed by the Central Region (n = 21, 58.3%) and the Western Region (n = 89, 53.3%) (p < 0.001). Prior experience with cosmetic procedures was strongly linked to future interest, as 85.6% of those who had previously undergone a procedure expressed interest in further treatments, compared to 42.7% of those without prior experience (p < 0.001) (Table 2).

Cosmetic Procedures Selection among Participants

The most well-known cosmetic procedures among participants included Botox (n = 255, 62.5%), laser hair removal (n = 255, 61.8%), and face and lip fillers (n = 249, 61.0%), followed by hair transplantation (n = 192, 47.1%) and skin lightening (n = 157, 38.5%). Additional less familiar procedures are outlined in Table 2. The primary sources of information about cosmetic procedures were advertisements (n = 224, 54.9%), followed by discussions with family and friends (Table 3).

Table 3: Participants' Familiarity, Experience, Satisfaction, and Attitude toward Cosmetic Procedures .

		N	%
Which of the following cosmetic procedures are you familiar with?	Botox	255	62.5%
	Laser hair removal	252	61.8%
	Face and lip fillers	249	61.0%
	Hair transplantation	192	47.1%
	Skin lightening	157	38.5%
	Plasma needles for face and hairs	149	36.5%
	Chemical peeling	136	33.3%
	Sculptra injections [collagen booster]	114	27.9%
	Fractional laser skin peeling	99	24.3%
	Regenerate hair needles	77	18.9%
	Fractional laser skin resurfacing	54	13.2%
	A cell for hair	33	8.1%
	Other	5	1.2%
How did you find out about these cosmetic procedures?	From advertisements	224	54.9%
	From family	213	52.2%
	From friends	209	51.2%
	From healthcare providers	188	46.1%
	Social media	10	2.5%
	Other	3	0.7%

In the past, have you had any cosmetic procedures? If yes, what cosmetic procedures have you had? (n=167)	No	241	59.1%
	Yes	167	40.9%
	Laser hair removal	92	55.1%
	Botox	84	50.3%
	Face and lip fillers	80	47.9%
	Skin lightening	35	21.0%
	Chemical peels	31	18.6%
	Plasma needles for the face and hair	28	16.8%
	Fractional laser skin peeling	19	11.4%
	Sculptra injections [collagen booster]	17	10.2%
	Regenerated hair needles	12	7.2%
	Hair transplantation	8	4.8%
	A cell for hair	5	3.0%
	Fractional laser skin resurfacing	4	2.4%
	Other	7	4.2%
Are you satisfied with the current result?	No	187	45.8%
	Satisfied with some of the measures	19	4.7%
	Somewhat	67	16.4%
	Yes	135	33.1%
Are you aware of any risks associated with cosmetic procedures?	No	102	25.0%
	Yes	306	75.0%
In your opinion, what are the main risks associated with cosmetic procedures?	Infection	228	56.0%
	Appearance of scars	221	54.3%
	Excessive bleeding	162	39.8%
	Healing failure	144	35.4%
	Anesthesia-related problems	144	35.4%
	Neuropathy	130	31.9%
	Other	4	1.0%
On a scale of 1 to 10, how satisfied are you with your current appearance?		7.86	1.98
Do you have the desire to undergo multiple cosmetic procedures to achieve the look you want?	No	238	58.3%
	Yes	170	41.7%
Are you considering non-surgical cosmetic procedures (such as Botox and fillers)?	No	194	47.5%
	Yes	214	52.5%
What factors might influence your decision to undergo cosmetic procedures?	Potential risks	260	63.7%
	Cost	245	60.0%
	Dermatologist's reputation	180	44.1%
	Recovery period	138	33.8%
	Experiences of relatives, friends, etc.	95	23.3%
	Desire to improve self-confidence	90	22.1%
	Other	10	2.5%
Do you think cosmetic procedures are becoming more socially acceptable?	No	58	14.2%
	Yes	350	85.8%

Which of the following statements best describes your attitude toward cosmetic procedures?	I believe everyone has the right to change their appearance.	183	45.2%
	I believe that cosmetic procedures set unrealistic standards of beauty.	144	35.6%
	I am against cosmetic procedures for ethical reasons.	93	23.0%
	I am considering cosmetic procedures for medical reasons.	76	18.8%
	Other	6	1.5%
Do you think the media has an influence on people's desire for cosmetic procedures?	No	15	3.7%
	Yes	393	96.3%
Do you think that cosmetic procedures play a role in enhancing a person's self-confidence?	No	98	24.0%
	Yes	310	76.0%

Among those encouraged to undergo cosmetic procedures, 167 participants (40.9%) had undergone at least one, with laser hair removal being the most common (n = 92, 55.1%), followed by Botox (n = 84, 50.3%) and face and lip fillers (n = 80, 47.9%). A summary of other procedures is provided in Table 3.

Satisfaction with Cosmetic Procedures

Approximately 45% (n = 187) of participants reported dissatisfaction with their cosmetic procedure results, while 33.1% (n = 135) were completely satisfied (Table 3). A significant majority, 75% (n = 306), acknowledged the risks associated with cosmetic procedures, with infection (n = 228, 56.0%) and scarring (n = 221, 54.3%) being the most commonly recognized concerns.

When asked to rate their satisfaction with their appearance on a scale of 1 to 10, the average score was 7.86 ± 1.98 (Table 3). More than half (n = 238, 58.3%) expressed no desire for multiple procedures, whereas 52.5% (n = 214) were open to non-surgical options, such as Botox or fillers. The most influential factors in the decision to undergo cosmetic procedures were concerns about potential risks (n = 260, 63.7%) and cost (n = 245, 60.0%). Additionally, dermatologist reputation (n = 180, 44.1%) and the recovery period (n = 138, 33.8%) also played a role in decision-making. Most participants (n = 350, 85.8%) believed that cosmetic procedures are becoming increasingly socially acceptable, while 45.2% (n = 183) supported individuals' right to alter their appearance. However, 35.6% (n = 144) felt that these procedures reinforce unrealistic beauty standards, and 23.0% (n = 93) opposed them for ethical reasons (Table 3).

Nearly all participants (n = 393, 96.3%) agreed that the media plays a significant role in influencing the desire for cosmetic procedures, and 76.0% (n = 310) believed these procedures could enhance self-confi-

dence (Table 3).

Perceptions, Risks, and Attitudes Toward Cosmetic Procedures

The analysis identified significant factors influencing the consideration of cosmetic procedures. Individuals who were more satisfied with their appearance were less likely to consider surgery, with a median satisfaction score of 9.00 (IQR 7.00–10.00) for those not considering procedures versus 8.00 (IQR 7.00–9.00) for those who were ($p < 0.001$) (Table 4).

Table 4: The association between perceptions, risks, and attitudes of participants toward cosmetic procedures .

			Have you ever thought about having cosmetic procedures or surgeries?				
			No		Yes		P value
			n	%	n	%	
Are you aware of any risks associated with cosmetic procedures?		No	48	47.1%	54	52.9%	0.102
		Yes	114	37.3%	192	62.7%	
In your opinion, what are the main risks associated with cosmetic procedures?		No	108	38.8%	170	61.2%	0.341
		Yes	54	41.5%	76	58.5%	
	Appearance of scars	No	81	43.3%	106	56.7%	0.187
		Yes	81	36.7%	140	63.3%	
	Healing failure	No	98	37.1%	166	62.9%	0.169
		Yes	64	44.4%	80	55.6%	
	Infection	No	76	42.2%	104	57.8%	0.361
		Yes	86	37.7%	142	62.3%	
	Anesthesia-related problems	No	101	38.3%	163	61.7%	0.459
		Yes	61	42.4%	83	57.6%	
	Excessive bleeding	No	91	37.0%	155	63.0%	0.180
		Yes	71	43.8%	91	56.2%	
	Other	No	160	39.6%	244	60.4%	0.651
		Yes	2	50.0%	2	50.0%	
On a scale of 1 to 10, how satisfied are you with your current appearance? Median (IQR)			9.00	7.00-10.00	8.00	7.00-9.00	<0.001*
Do you have the desire to undergo multiple cosmetic procedures to achieve the look you want?		No	149	62.6%	89	37.4%	<0.001*
		Yes	13	7.6%	157	92.4%	
Are you considering non-surgical cosmetic procedures (such as Botox and fillers)?		No	134	69.1%	60	30.9%	<0.001*
		Yes	28	13.1%	186	86.9%	

What factors might influence your decision to undergo cosmetic procedures?	Cost	No	84	51.5%	79	48.5%	<0.001*
		Yes	78	31.8%	167	68.2%	
	Recovery period	No	106	39.3%	164	60.7%	0.831
		Yes	56	40.6%	82	59.4%	
	Potential risks	No	52	35.1%	96	64.9%	0.172
		Yes	110	42.3%	150	57.7%	
	Experiences of relatives, friends, etc.	No	131	41.9%	182	58.1%	0.120
		Yes	31	32.6%	64	67.4%	
	Dermatologist's reputation	No	99	43.4%	129	56.6%	0.103
		Yes	63	35.0%	117	65.0%	
	Desire to improve self-confidence	No	137	43.1%	181	56.9%	0.010*
		Yes	25	27.8%	65	72.2%	
	Other	No	156	39.2%	242	60.8%	0.205
		Yes	6	60.0%	4	40.0%	
Do you think cosmetic procedures are becoming more socially acceptable?		No	37	63.8%	21	36.2%	<0.001*
		Yes	125	35.7%	225	64.3%	
Which of the following statements best describes your attitude toward cosmetic procedures?	I believe everyone has the right to change their appearance.	No	121	53.8%	104	46.2%	<0.001*
		Yes	41	22.4%	142	77.6%	
	I believe that cosmetic procedures set unrealistic standards of beauty.	No	95	36.0%	169	64.0%	0.044*
		Yes	67	46.5%	77	53.5%	
	I am against cosmetic procedures for ethical reasons.	No	95	30.2%	220	69.8%	<0.001*
		Yes	67	72.0%	26	28.0%	
	I am considering cosmetic procedures for medical reasons.	No	139	41.9%	193	58.1%	0.069
		Yes	23	30.3%	53	69.7%	
	Other	No	160	39.8%	242	60.2%	1.000
		Yes	2	33.3%	4	66.7%	
*p<0.05, Significant							

A strong association was found between interest in multiple procedures and consideration of surgery, as 92.4% (n = 157) of those desiring multiple procedures had considered surgery, compared to 37.4% (n = 89) of those who had not (p < 0.001). Similarly, 86.9% (n = 186) of those considering non-surgical procedures, such as Botox or fillers, had previously thought about surgery, compared to 30.9% (n = 60) of those who had not (p < 0.001).

Cost played a significant role, with 68.2% (n = 167) of those financially influenced considering surgery, compared to 48.5% (n = 79) of those not affected by cost (p < 0.001) (Table 4). The desire to enhance self-confidence was another factor, with 72.2% (n = 65) of those motivated

by self-confidence contemplating surgery, compared to 56.9% (n = 181) who were not (p = 0.010). Social acceptance also influenced decisions, as 64.3% (n = 225) of those who viewed cosmetic procedures as socially acceptable had considered surgery, compared to 36.2% (n = 21) who did not (p < 0.001) (Table 4).

Risk Awareness, Influencing Factors, and Experience with Cosmetic Procedures

Participants who had experienced an infection were more likely to have undergone cosmetic procedures (n = 105, 46.1%) than those without an infection (n = 62, 34.4%) (p = 0.020). The desire for multiple procedures strongly influenced past cosmetic procedures, with 61.2% of those wanting multiple treatments having undergone them, compared to 26.5% of those who did not (p < 0.001) (Table 5- Supplementary file). Similarly, participants considering non-surgical procedures, such as Botox or fillers, were significantly more likely to have had cosmetic procedures (n = 128, 59.8%) than those not considering such treatments (n = 39, 20.1%) (p < 0.001). Cost was another determining factor, as 46.1% (n = 113) of those considering cost had undergone procedures, compared to 33.1% (n = 54) who were not influenced by cost (p = 0.010).

Self-confidence played a significant role, with 56.7% (n = 51) of those motivated by self-confidence having undergone procedures, compared to 36.5% (n = 116) who were not (p < 0.001). Social acceptance also had an impact, as 45.4% (n = 159) of participants who viewed cosmetic procedures as increasingly acceptable had undergone them, compared to 13.8% (n = 8) who did not share this view (p < 0.001). Attitudes toward cosmetic procedures further influenced past experiences. Those who believed in the right to alter one's appearance were more likely to have undergone procedures (60.1%) than those who disagreed (25.3%) (p < 0.001). Ethical concerns significantly deterred individuals, with 86.0% of those opposing cosmetic procedures for ethical reasons not having undergone them, compared to 48.9% of those without ethical objections (p < 0.001). (Table 5- Supplementary file).

			In the past, have you had any cosmetic procedures?				
			No		Yes		P valueF/U
			N	%	N	%	
Are you aware of any risks associated with cosmetic procedures?		No	63	61.8%	39	38.2%	0.562
		Yes	178	58.2%	128	41.8%	
In your opinion, what are the main risks associated with cosmetic procedures?	Neuropathy	No	163	58.6%	115	41.4%	0.829
		Yes	78	60.0%	52	40.0%	
	Appearance of scars	No	117	62.6%	70	37.4%	0.191
		Yes	124	56.1%	97	43.9%	
	Healing failure	No	152	57.6%	112	42.4%	0.461
		Yes	89	61.8%	55	38.2%	
	Infection	No	118	65.6%	62	34.4%	0.020*
		Yes	123	53.9%	105	46.1%	
	Anesthesia-related problems	No	147	55.7%	117	44.3%	0.073
		Yes	94	65.3%	50	34.7%	
	Excessive bleeding	No	146	59.3%	100	40.7%	0.918
		Yes	95	58.6%	67	41.4%	
	Other	No	239	59.2%	165	40.8%	1.000
		Yes	2	50.0%	2	50.0%	
On a scale of 1 to 10, how satisfied are you with your current appearance? Median (IQR)			8.00	7.00-10.00	8.00	7.00-9.00	
Do you have the desire to undergo multiple cosmetic procedures to achieve the look you want?		No	175	73.5%	63	26.5%	<0.001*
		Yes	66	38.8%	104	61.2%	
Are you considering non-surgical cosmetic procedures (such as Botox and fillers)?		No	155	79.9%	39	20.1%	<0.001*
		Yes	86	40.2%	128	59.8%	
What factors might influence your decision to undergo cosmetic procedures?	Cost	No	109	66.9%	54	33.1%	0.010*
		Yes	132	53.9%	113	46.1%	
	Recovery period	No	162	60.0%	108	40.0%	0.597
		Yes	79	57.2%	59	42.8%	
	Potential risks	No	91	61.5%	57	38.5%	0.466
		Yes	150	57.7%	110	42.3%	
	Experiences of relatives, friends, etc.	No	190	60.7%	123	39.3%	0.235
		Yes	51	53.7%	44	46.3%	
	Dermatologist's reputation	No	143	62.7%	85	37.3%	0.105
		Yes	98	54.4%	82	45.6%	
	Desire to improve self-confidence	No	202	63.5%	116	36.5%	<0.001*
		Yes	39	43.3%	51	56.7%	
	Other	No	231	58.0%	167	42.0%	0.007*
		Yes	10	100.0%	0	0.0%	
Do you think cosmetic procedures are becoming more socially acceptable?		No	50	86.2%	8	13.8%	<0.001*
		Yes	191	54.6%	159	45.4%	

Which of the following statements best describes your attitude toward cosmetic procedures?	I believe everyone has the right to change their appearance.	No	168	74.7%	57	25.3%	<0.001*
		Yes	73	39.9%	110	60.1%	
	I believe that cosmetic procedures set unrealistic standards of beauty.	No	148	56.1%	116	43.9%	0.114
		Yes	93	64.6%	51	35.4%	
	I am against cosmetic procedures for ethical reasons.	No	161	51.1%	154	48.9%	<0.001*
		Yes	80	86.0%	13	14.0%	
	I am considering cosmetic procedures for medical reasons.	No	198	59.6%	134	40.4%	0.698
		Yes	43	56.6%	33	43.4%	
	Other	No	235	58.5%	167	41.5%	0.086
		Yes	6	100.0%	0	0.0%	
*p<0.05, Significant							

Discussion:

Cosmetic procedures have been extensively studied across various cities and regions in Saudi Arabia. However, a gap remains in knowledge regarding the overall attitudes and awareness of the Saudi population toward these procedures across all regions. This gap is particularly important, as understanding public perceptions can help healthcare providers tailor their services to meet patient needs better. Our study findings can influence health policies and educational programs aimed at increasing community awareness about the risks and safety of cosmetic procedures. Addressing this gap will contribute valuable insights to academic research and clinical practices in cosmetic procedures.

According to the American Society of Plastic Surgeons' annual plastic surgery statistics report, over 17.7 million surgical and minimally invasive cosmetic procedures were conducted in the United States in 2018, with numbers steadily increasing over the years[18]. A cross-sectional study conducted in Riyadh, Saudi Arabia, utilizing a sample size of 500 females, found that 55.4% had undergone a cosmetic procedure[19]. Among the participants, 54.7% refrained from cosmetic surgery due to lack of necessity, 17% cited financial constraints, and 9.4% attributed their decision to social factors. Among those who underwent procedures, 58% aimed to enhance their appearance, while 31% sought to reverse facial changes. Personal factors such as appearance orientation, body dissatis-

faction, and previous exposure to cosmetic procedures influence the acceptance and intention to undergo cosmetic surgery[5, 6].

Media Influence

Appearance-related social media content has been shown to significantly impact body image and cosmetic surgery intentions compared to non-appearance-focused content[10,14]. The cultivation theory[14] suggests that exposure to idealized appearances may normalize these standards and increase their desirability. Research suggests that frequent exposure to appearance-focused social media content is positively correlated with the acceptance and normalization of cosmetic procedures. Additionally, active engagement with social media, such as posting and editing selfies, has been linked to decreased body satisfaction, lower self-esteem, and increased social anxiety[20]. Consequently, the act of sharing edited images may reinforce positive attitudes toward cosmetic procedures and heighten the desire for aesthetic enhancements.

Psychological Aspects

Aesthetic procedures have traditionally been more prevalent among women. The literature indicates a positive relationship between these procedures and psychological well-being, particularly in individuals with pre-existing high self-esteem. However, among younger males and individuals with a history of mental health conditions, including depression, anxiety, personality disorders, and body dysmorphic disorder, cosmetic procedures have been associated with poorer psychological outcomes[21]. Non-invasive aesthetic procedures, such as filler injections, have demonstrated stronger associations with improved psychological and social well-being compared to invasive procedures[23]. A study conducted in the Eastern Province of Saudi Arabia found that older students, those with previous aesthetic procedures, and engineering students were more predisposed to these interventions[23]. Multiple factors, including age, gender, relationship status, and psychological considerations, influence the decision to undergo aesthetic procedures and their subsequent impact on psychological well-being.

The increasing prevalence of aesthetic procedures in Saudi Arabia is influenced by factors such as body image dissatisfaction, the pursuit of perfection, and the growing influence of social media3. The 2017 American Academy of Facial Plastic and Reconstructive Surgery survey found that 55% of patients were willing to undergo cosmetic procedures to enhance their appearance in selfies, a phenomenon termed "Snapchat dysmorphia"[24]. Furnham and Levitas found that increased media exposure, low self-esteem, and life dissatisfac-

tion increase the likelihood of undergoing cosmetic procedures. A study by Aldosari et al. revealed that 65.7% of patients in Saudi Arabian plastic surgery centers were influenced by before-and-after images shared on aesthetic surgeons' social media accounts[25]. Snapchat (73.7%) was the most commonly used platform among rhinoplasty patients, followed by Instagram (12.7%)[26].

Our study investigates attitudes toward cosmetic procedures in Saudi Arabia, revealing that approximately 60.3% of participants have considered undergoing aesthetic treatments. This finding is consistent with a 2019-2020 study conducted in Majmaah, where 47% of participants accepted cosmetic procedures[27]. The increasing demand for cosmetic treatments may be driven by evolving beauty standards, social media influence, and the growing accessibility of non-surgical options, such as Botox and fillers.

Gender and Age Differences

Gender differences were evident, with 69.2% of females expressing interest in cosmetic procedures compared to 35.8% of males. This aligns with prior research indicating that women are more susceptible to societal pressures regarding appearance[3, 28, 29]. Age was also a significant factor, with individuals aged 25-34 being the most likely to consider cosmetic treatments, while those aged 55-64 were the least likely, a trend supported by prior studies[12, 30]. Younger individuals, who are more exposed to modern beauty standards via social media, exhibit greater acceptance of cosmetic procedures.

Dissatisfaction and Risk Awareness

Among participants, 40.9% reported having undergone at least one cosmetic procedure, with laser hair removal and Botox being the most common choices. This aligns with global trends where non-invasive treatments have gained popularity due to their lower risk and minimal recovery time[31, 32]. While 75.0% of participants were aware of the risks associated with cosmetic procedures, 45.8% of those who had undergone treatments reported dissatisfaction, potentially due to unrealistic beauty standards. Similar dissatisfaction rates have been observed in previous studies, reflecting the pressure to achieve unattainable aesthetic ideals[33, 34].

Regional Variations and Ethical Concerns

Geographical disparities in the acceptance of cosmetic procedures were also noted, with 81.4% of participants from the Northern Region considering aesthetic interventions, compared to 53.0% in the Western Region. This may be attributed to cultural differences or varying access to cosmetic services. A study conducted

in Mumbai found that urban areas, where cosmetic clinics are more accessible, tend to have higher acceptance rates[35]. The study also found that 85.8% of participants believe cosmetic procedures are increasingly accepted in society, a trend consistent with findings from other global studies[36].

Ethical Concerns and Social Acceptance

Media and public figures openly discussing their enhancements contribute to the increasing normalization of cosmetic procedures. However, ethical concerns persist, with 23.0% of participants opposing such interventions on moral grounds, echoing previous findings that raise similar concerns[37].

This growing normalization may reflect evolving beauty ideals and a broader shift in cultural values, where aesthetic enhancement is no longer viewed merely as vanity but rather as a legitimate form of self-care or personal expression. In our study, 85.8% of participants perceived cosmetic procedures as socially acceptable, suggesting that societal stigma is steadily diminishing. Nonetheless, this acceptance may also generate subtle pressures to conform to evolving appearance standards, potentially reinforcing the very unrealistic beauty ideals that drive dissatisfaction and ethical hesitation. This duality highlights the complexity of social acceptance, where individual freedom coexists with implicit societal expectations.

Furthermore, 76.0% of participants believed that cosmetic procedures could enhance self-confidence. This aligns with research suggesting that individuals often seek aesthetic enhancements to improve self-esteem and body image[38]. However, while such interventions may offer temporary psychological benefits, addressing deeper concerns about self-esteem remains essential, as external changes alone may not ensure sustained satisfaction.

Limitation

This study has limitations, such as self-reported data biases and restricted participation due to its online format. The cross-sectional design limits causal inferences. Additionally, recruiting participants through online platforms may have introduced a selection bias favoring younger, more technologically adept individuals. This could limit the generalizability of the findings to older or less internet-active segments of the population. Future research should include diverse, rural populations and longitudinal studies to track the evolving attitudes. Healthcare providers must improve their education, while public health efforts should promote informed decisions and ethical awareness.

Conclusions:

Our study highlights a growing interest in cosmetic procedures among the Sau-

di population, especially among younger adults and women. Non-surgical treatments, such as Botox and laser hair removal, are most preferred; however, many participants reported dissatisfaction, highlighting the need for better communication about risks and realistic expectations. While social acceptance is increasing, ethical concerns persist. These findings underscore the importance of informed decision-making and education in promoting safe and satisfactory cosmetic experiences.

Declarations

Ethical Consideration: This study was approved by the biomedical ethical committee at the University of Jeddah, Jeddah, Saudi Arabia [IRB.no.UJ-REC-247]

Informed Consent Statement: Informed consent was obtained from all participants involved in the study.

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Data Availability Statement: The datasets generated during and/or analyzed during the current study are available from the corresponding author [SAL] on reasonable request.

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