Patient Factors That Impact FACE-Q Aesthetics Outcomes: An Exploratory Cross-sectional Regression Analysis

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Abstract

Background: The FACE-Q Aesthetics is a validated tool for assessing patient-reported outcomes related to surgical and nonsurgical facial aesthetic treatments. Recognizing patient-specific variables that may influence FACE-Q scores is essential to control for potential confounders in research.

Objectives: This study aimed to identify factors that predict FACE-Q Aesthetics scale scores.

Methods: A cross-sectional survey was conducted among an international cohort of participants recruited through the Prolific platform. Participants aged 20 years or older, who had undergone noninvasive facial aesthetic procedures within the past year, were included. Demographic and clinical information was collected, and univariable and multivariable linear regression analyses were employed to assess predictors of FACE-Q Face Overall, Psychological, and Social scale scores.

Results: A total of 1259 participants were analyzed, with an average age of 42.6 years (±11.9). The mean scores were 52.4 (±18.3) for the Face Overall scale, 56.5 (±23.7) for the Psychological scale, and 62.7 (±24.0) for the Social scale. Several factors were significantly associated ($P < .05$) with higher scores, including lower BMI, African American ethnicity, male gender, Fitzpatrick skin Type V, residence in the United States, financial stability, and residual effects of previous aesthetic treatments. Younger participants were more likely to report higher Face Overall scores ($P < .05$).

Conclusions: This study identified several patient characteristics that predict Face Overall, Psychological, and Social scale scores. These findings offer valuable insights into how patient-specific factors influence outcomes following facial aesthetic procedures and underscore the need to account for these variables in future research using the FACE-Q Aesthetics tool.

Level of Evidence: 3 (Therapeutic)

The FACE-Q Aesthetics module is a validated patient-reported outcome measure (PROM) designed to evaluate outcomes that are important to patients following facial cosmetic procedures.[1,2] Specifically, FACE-Q Aesthetics scales measure appearance (ie, 24 scales), health-related quality of life (HRQL, ie, 10 scales), natural (ie, 3 scales), and adverse effects domains (ie, 6 checklists).[1,2] These PROMs are not intervention specific, allowing for comparisons across various surgical and minimally invasive interventions.[3]

The authors of the study have previously reported a consistent rise in the application of FACE-Q Aesthetics scales since their introduction in 2010, particularly within observational research frameworks. In April 2022, the United States FDA approved 11 FACE-Q Aesthetics scales as Medical Device Development Tools, which is expected to further enhance their adoption.[4]

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Because of significant challenges in implementing randomized controlled trials (RCTs) in aesthetics research—where randomization effectively manages both known and unknown confounding variables—it is essential for researchers to carefully identify and account for confounding factors and effect modifiers in observational study designs. Failure to do so can result in biased outcomes, as these variables may independently influence results regardless of the intervention under study.[5] For example, a survey by Fabi et al[6] highlighted notable generational and gender-based differences in facial features considered of "very high" or "extreme" concern among individuals who were aesthetically conscious. Such factors can influence PROM data and should therefore be controlled to accurately assess the intervention's effects.

The primary aim of this exploratory regression analysis was to identify participant-specific factors significantly associated with FACE-Q Aesthetics Face Overall, Psychological, and Social scale scores. These findings aim to inform future observational studies by identifying variables that should be adjusted for in their design.

METHODS

This study was coordinated at McMaster University (Hamilton, ON, Canada). Research ethics board approval (#13603) was obtained from the Hamilton Integrated Research Ethics Board before study commencement.

Sample and Recruitment

This study was conducted as a secondary analysis of data collected to validate the newly developed FACE-Q Aesthetics scales, which aimed to measure the concept of "natural" from a patient's perspective as well as evaluate the test-retest reliability of 17 previously established FACE-Q Aesthetics scales.[7] Detailed information on participant recruitment and selection has been described in our previous study.[8] Recruitment for the survey was conducted through the Prolific online platform (www.prolific.com; London, United Kingdom) in North America in December 2022 and, separately, in the United Kingdom in August 2023. This followed a pilot study using REDCap (Vanderbilt University, Nashville, TN) that included 144 participants. Participants received compensation equivalent to £10.80 per hour for their time.

Eligibility criteria for the study required participants to: (1) be at least 20 years of age; (2) reside in Canada, the United Kingdom, or the United States; and (3) have attended a dermatology or plastic surgery clinic within the past 12 months for 1 of 14 facial aesthetic treatments (Appendix).

A flow diagram (Figure 1) provides an overview of the methods used for participant invitation and selection. Respondents were asked to supply demographic and clinical details and to complete relevant FACE-Q Aesthetics scales using branching logic. Only those who completed the FACE-Q Aesthetics Face Overall, Psychological, and Social scales were included in this analysis. These 3 scales were selected as they were identified as the most reported FACE-Q scales in a systematic review conducted by the authors.[7]

FACE-Q Aesthetics Scales

The FACE-Q Aesthetics Face Overall scale consists of 10 items designed to assess participants' satisfaction with the overall appearance of their face. The Psychological scale, also comprising 10 items, evaluates aspects of psychological well-being (eg, feelings of happiness, attractiveness, or confidence) in relation to facial appearance.

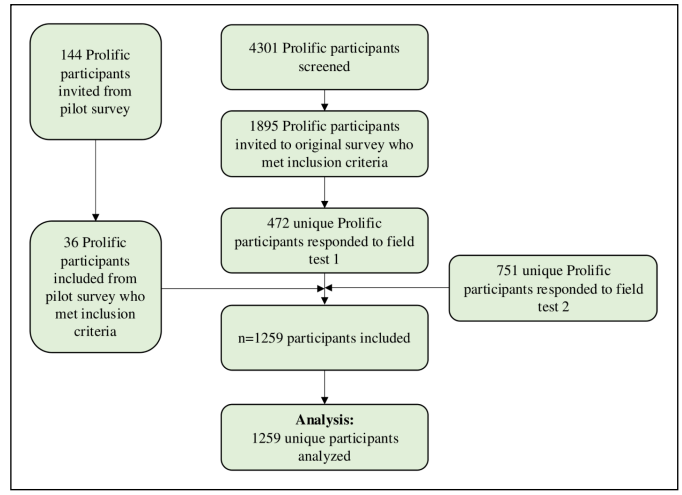

Figure 1. Participant sample and recruitment flow diagram.

The Social scale, which includes 8 items, examines how facial appearance affects social interactions (eg, comfort in meeting new people). Detailed descriptions of these scales are available in the FACE-Q Aesthetics Module User's Guide (https://qportfolio.org/face-q/aesthetics/). Raw ordinal scores from all FACE-Q Aesthetics scales are transformed into continuous values ranging from 0 to 100, with higher scores reflecting better outcomes. For the Face Overall scale, higher scores indicate greater satisfaction with facial appearance, while for the Psychological and Social scales, they represent improved HRQL.

Data Analysis

Demographic and clinical characteristics of participants were analyzed using descriptive statistics. Ten demographic and clinical variables were selected for inclusion in this analysis (Table 1), guided by clinical expertise, hypothesized influences on FACE-Q Aesthetics scale scores, and insights from the existing literature.[9]

To assess the relationship between each predictor variable and the FACE-Q Aesthetics Face Overall, Psychological, and Social scales, scatter plots with lines of best fit were initially used for graphical exploration. Simple linear regression was performed to determine the presence of linear relationships, with statistical significance assessed using the Wald test for continuous variables and the Partial *F*-test for categorical variables. Variables showing significant linear relationships or variables that were previously selected by study authors based on the review of the literature or their hypothesized impact on the FACE-Q scale scores were subsequently included in a multivariable linear regression model. The relative importance of predictor variables was assessed using standardized coefficients (β^*), and the model's overall explanatory power was summarized by the coefficient of determination (R^2). Multicollinearity was identified using a variance inflation factor (VIF) threshold >5, indicating significant multicollinearity.[10]

The study's sample size ($n = 1259$) was determined to be sufficient based on Harrell's rule of thumb, which recommends 10 to 20 participants per predictor variable.[11] The assumptions of normality and homoscedasticity required for linear regression were evaluated using residual analysis and *P*–*P* plots. Missing data were managed using pairwise deletion (available case analysis). For categorical variables with response options such as "Other" or "Prefer not to answer," categories representing <5% of the sample were excluded from the

Table 1. Demographic and Clinical Information for Participants

Participant characteristics	*n* = 1259	%
Age (years)		
20-29	202	16.0
30-39	277	22.0
40-49	427	33.9
50-59	234	18.6
60-69	99	7.9
70-79	20	1.6
BMI (kg/m^2)		
Underweight (<18.5)	88	7.0
Normal (18.5-24.9)	559	44.4
Overweight (25.0-29.9)	338	26.8
Obese Class I (30.0-34.9)	152	12.1
Obese Class II (35.0-39)	46	3.7
Obese Class III (>40.0)	42	3.3
Missing/prefer not to answer	34	2.7
Self-identified race		
Caucasian	968	76.9
Black	90	7.1
Hispanic/Latino	29	2.3
South Asian	48	3.8
East Asian	42	3.3
Middle Eastern	8	0.6
Other/prefer not to answer	74	5.9
Gender		
Male	333	26.4
Female	913	72.5
Other/prefer not to answer	13	1.0
Fitzpatrick Phototyping Scale		
I	92	7.3
II	343	27.2
III	458	36.4
IV	246	19.5
V	102	8.1
VI	18	1.4
Highest level of education		
Completed some or all of high school	113	9.0
Completed some or all of college/trade school/ university	815	64.7
Completed some or all of masters/doctoral degree	330	26.2
Prefer not to answer	1	0.1
Marital status		
Married/common-law	701	55.7
Widowed	13	1.0
Separated/divorced	141	11.2
Single, never married	389	30.9
Other/prefer not to answer	15	1.2
Country of residence		
Canada	89	7.1
United States of America	628	49.9
United Kingdom	540	42.9
Missing/prefer not to answer	2	0.2
In the past 3 months how difficult was it for you to pay household expenses?		
Not at all difficult	479	38.0
A little difficult	411	32.6
Somewhat difficult	252	20.0
Very difficult	66	5.2
Extremely difficult	45	3.6
Missing/prefer not to answer	6	0.5
Whether previous aesthetic interventions have "Worn Off"		
Not worn off	1006	79.9
Worn off	253	20.1

regression analysis. Statistical significance was defined as $P \leq .05$. All analyses were conducted using SPSS version 29.0 (IBM Corporation, Armonk, NY).[12]

RESULTS

Demographic and Clinical Characteristics

From the initial pool of 1895 individuals invited to participate in the survey, 1259 participants were included in this analysis. The average age of the respondents was 42.6 years (±11.9), ranging from 20 to 75 years. Of the participants, 72.5% ($n = 912$) were identified as women, with a mean BMI of 25.7 kg/m^2 (±6.2). Table 1 provides a detailed summary of the demographic and clinical characteristics. The participants' mean scores for the Face Overall, Psychological, and Social scales were 52.4 (±18.3), 56.45 (±23.7), and 62.7 (±24.0), respectively (Table 2).

Table 2. Distribution of FACE-Q Aesthetics Scale Scores

FACE-Q scale	*n*	Mean (SD)	Minimum	Maximum	Participants reporting maximum score, *n* (%)
Face overall	1259	52.4 (±18.3)	0	100	48 (3.8)
Psychological	1259	56.5 (±23.7)	0	100	169 (13.4)
Social	1259	62.7 (±24.0)	0	100	112 (8.9)

SD, standard deviation.

Face Overall Scale

Univariable linear regression analysis (Table 3) revealed that higher satisfaction with facial appearance was significantly ($P < .05$) linked to younger age, lower BMI, Black ethnicity, male gender, Fitzpatrick skin Type V, being single, residing in the United States, reporting no financial hardship, and ongoing effects of previous minimally invasive aesthetic procedures.

In the multivariable model incorporating these significant variables (Table 3), factors such as age, BMI, ethnicity, gender, country of residence, financial stability, and residual effects of previous interventions remained statistically significant ($P < .05$). No multicollinearity (VIF >5) was detected. Among these predictors, ethnicity—specifically identifying as African American—emerged as the most influential factor, with a standardized coefficient (β^*) of .17. Overall, the model accounted for 18.4% of the variation in Face Overall scores and was statistically significant ($R^2 = 0.18$, $F(24, 1192) = 11.2$, $P < .01$).

Psychological Scale

The univariable regression analysis (Table 4) identified significant associations ($P < .05$) between improved psychological functioning and variables, such as lower BMI, Black ethnicity, male gender, US residency, Fitzpatrick skin Type V, widowhood, financial stability, and ongoing effects of previous minimally invasive aesthetic treatments.

When these predictors were entered into a multivariable regression model (Table 4), BMI, ethnicity, gender, country of residence, financial stability, and residual effects of previous procedures remained significant ($P < .05$). No multicollinearity was observed (VIF >5). Financial stability, particularly reporting "somewhat difficult" circumstances, was the most impactful variable, with a standardized coefficient (β^*) of .20. The multivariable model explained 16.1% of the variability in Psychological scale scores ($R^2 = 0.16$, $F(23, 1193) = 9.9$, $P < .01$).

Social Scale

For the Social scale, univariable linear regression (Table 5) showed significant relationships ($P < .05$) between higher scores and factors, such as increasing age, lower BMI, participant ethnicity, male gender, US residency, Fitzpatrick skin Type V, financial stability, and ongoing effects of previous minimally invasive aesthetic interventions.

In the multivariable model (Table 5), BMI, ethnicity, gender, country of residence, Fitzpatrick scale, and financial stability remained significant after adjusting for other factors. Financial stability, specifically self-reported "somewhat difficult" circumstances, was the most influential factor, with a standardized coefficient (β^*) of −.19. The model explained 16% of the variability in Social scale scores ($R^2 = 0.16$, $F(21, 1195) = 10.8$, $P < .01$).

DISCUSSION

This analysis provides evidence of patient-level factors that may be associated with higher FACE-Q Aesthetics Face Overall, Psychological, and Social scores in an online, international sample following minimally invasive facial aesthetic procedures. For both researchers and clinicians, this exploratory analysis is primarily hypothesis generating and seeks to identify participant characteristics that may be potential confounders or effect modifiers and therefore should be adjusted for within nonrandomized observational study designs.

Individuals who seek facial aesthetic treatments come from a wide range of backgrounds. Understanding how various clinical and demographic factors may contribute to patient perceptions of appearance and HRQL may be helpful in better evaluating outcomes in facial aesthetics research.[13] Notably, several researchers have sought to assess facial aesthetic treatments by utilizing the FACE-Q Aesthetics scales as a PROM in RCTs.[14,15] As previously stated, RCTs are unique in that randomization allows for a balance of known and unknown potential confounding variables when performing a comparative analysis. However, in instances when RCT designs cannot be employed, identifying potential confounders and subsequently controlling for these variables, may limit the potential for bias within these non-RCT study designs.

This univariable analysis demonstrated that participants with higher Face Overall Psychological and Social scales scores had a tendency toward the following: a lower BMI, African American ethnicity, identification as male, a Fitzpatrick scale Type V, never married status, residence within the United States, no financial difficulties within the past 3 months, and an ongoing "effect" from previous aesthetic interventions. Of note, the multivariable analyses demonstrated that on average, minority races (African American, Hispanic/Latino, and Asian) had an increase in Appearance Overall, Psychological, and Social scale scores, even after adjusting for other statistically significant variables within the model. Of note, when standardized coefficients were compared in the multivariable models, African American race demonstrated the largest absolute value ($\beta^* = .17$) for the Face Overall scale. However, when standardized scores were adjusted in the Psychological and Social scale multivariable models, having "somewhat difficult" financial stability in the past 3 months had the largest absolute impact on scale scores at $\beta^* = -.20$ and $\beta^* = -.19$, respectively.

These results may be explained by several phenomena. Specifically, this may be because of perceived facial standards that differ in specific cultures.[16] Additionally, the unique aging characteristics of skin with higher melanin levels may help explain why people of color often report greater satisfaction with their appearance as they age. Facial structures and higher levels of melanin in individuals of Asian, Hispanic, and African American backgrounds influence the way their skin ages. Although higher melanin levels can increase susceptibility to dyspigmentation, they also contribute to a thicker, more

Table 3. Univariable and Multivariable Linear Regression of FACE-Q Face Overall Scale on Participant Variables

Variable	Univariable regression			Multivariable regression				
	β	*P*-value	95% CI	*β*	*β**	*P*-value	95% CI	VIF
Age, years	−.18	<.05	−0.26 to −0.93	−.20	−.13	<.05	−0.30 to −0.11	1.4
BMI (kg/m^2)	−.28	<.05	−0.44 to −0.11	−.18	−.06	<.05	−0.33 to −0.22	1.1
Ethnicity (Ref. = Caucasian)		<.05				<.05		
Black	16.7		12.8 to 20.5	12.4	.17		8.1 to 16.4	1.4
Hispanic/Latino	10.6		4.1 to 17.2	7.2	.06		0.80 to 13.6	1.1
South Asian	6.6		1.4 to 11.7	4.2	.04		−0.91 to 9.4	1.1
East Asian	3.2		−2.3 to 8.7	−1.4	−.01		−6.8 to 3.9	1.1
Middle Eastern	9.5		−2.9 to 21.8	6.4	.03		−5.5 to 18.3	1.0
Other	2.8		−1.4 to 7.0	NA	NA		NA	NA
Gender (Ref. = female)	7.7	<.05	5.5 to 10.0	6.7	.16	<.05	4.3 to 8.7	1.1
Marital status (Ref. = single, never married)		<.05				.2		
Married/common-law	−.8		−3.1 to 1.4	1.0	.03		1-3. to 3.3	1.5
Widowed	−1.6		−11.7 to 8.4	6.7	.04		−3.1 to 16.4	1.1
Separated/divorced	−7.7		−11.2 to −4.2	−1.8	−.03		−5.5 to 1.9	1.5
Country (Ref. = United States)		<.05				<.05		
Canada	−2.0		−6.0 to 2.0	−2.4	−.03		−6.3 to 1.4	1.1
United Kingdom	−7.4		−9.4 to −5.3	−6.4	−.17		−8.4 to −4.3	1.1
Fitzpatrick Scale (Ref. = Fitzpatrick I)		<.05				.06		
Fitzpatrick II	−.6		−4.8 to 3.5	−.02	−.001		−4.0 to 3.9	3.5
Fitzpatrick III	1.5		−2.6 to 5.5	1.8	.04		−2.1 to 5.6	3.9
Fitzpatrick IV	4.1		−0.2 to 8.5	1.9	.04		−2.2 to 6.1	3.1
Fitzpatrick V	11.8		6.7 to 16.9	6.4	.09		1.4 to 11.5	2.1
Fitzpatrick VI	9.2		0.1 to 18.3	−2.8	−.02		−12.1 to 6.5	1.4
Financial stability (Ref. = not at all difficult)		<.05				<.05		
A little difficult	−5.4		−7.8 to −3.0	−4.5	−.12		−6.7 to −2.2	1.3
Somewhat difficult	−6.5		−9.3 to −3.8	−6.5	−.14		−9.1 to −3.8	1.3
Very difficult	−7.4		−12.1 to −2.8	−7.8	−.1		−12.3 to −3.4	1.1
Extremely difficult	−10.9		−16.5 to −5.5	−10.1	−.1		−15.4 to −4.8	1.1
Effect of previous aesthetic intervention (Ref. = not worn off)	−4.4	<.05	−6.9 to −1.8	−3.2	−.07	<.05	−5.5 to −0.77	1.0
Education (Ref. = some or all of high school)		.93		NA				
Completed some or all of college/trade school/university	.58		−3.0 to 4.2					
Completed some or all of masters/doctoral degree	.26		−3.6 to 4.2					

β represents the average change in scale score for every 1-unit change in covariate (continuous variables) or the average difference in scores compared with the reference value (categorical variables). *β** denotes standardized coefficient. *P*-value corresponds to Wald test (ie, continuous variables) and the Partial-*F* test (ie, categorical variables) for each *β* coefficient. Ref. denotes reference value. VIF refers to the variance inflation factor (ie, > 5 was used to denote definite multicollinearity). NA, not applicable.

Table 4. Univariable and Multivariable Linear Regression of FACE-Q Psychological Scale on Participant Variables

Variable	Univariable regression			Multivariable regression				
	β	*P*-value	95% CI	β	β^*	*P*-value	95% CI	VIF
BMI (kg/m^2)	−.4	<.05	−0.6 to 0.2	−.28	−.07	<.05	−0.48 to −0.07	1.1
Ethnicity (Ref. = Caucasian)		<.05				<.05		
Black	21.5		16.5 to 26.5	17.0	.18		11.4 to 22.7	1.4
Hispanic/Latino	11.8		3.2 to 20.4	11.0	.07		2.6 to 19.5	1.0
South Asian	7.2		0.5 to 14.0	6.8	.06		0.04 to 13.6	1.1
East Asian	3.5		−3.6 to 10.7	−.2	−.002		−7.3 to 6.9	1.1
Middle Eastern	12.8		−3.4 to 29.0	12.6	.04		−3.2 to 28.4	1.0
Other	−10.3		−22.2 to 1.6	NA	NA		NA	NA
Gender (Ref. = female)	7.9	<.05	4.9 to 10.8	5.7	.11	<.05	2.8 to 8.6	1.1
Marital status (Ref. = single, never married)		<.05				.06		
Married/common-law	3.3		0.4 to 6.3	3.03	.06		0.2 to 5.9	1.3
Widowed	6.6		−6.6 to 19.8	10.0	.04		−2.6 to 22.5	1.0
Separated/divorced	−3.5		−8.1 to 1.1	−.6	−.01		−5.0 to 3.9	1.3
Country (Ref. = United States)		<.05				<.05		
Canada	−2.0		−7.2 to 3.3	−1.8	−.02		−6.9 to 3.3	1.1
United Kingdom	−7.0		−9.7 to −4.3	−6.6	−.14		−9.3 to −3.9	1.1
Fitzpatrick Scale (Ref. = Fitzpatrick I)		<.05				.08		
Fitzpatrick II	−1.0		−6.4 to 4.5	−.5	−.01		−5.7 to 4.7	3.5
Fitzpatrick III	2.2		−3.1 to 7.5	1.8	.04		−3.3 to 6.9	3.9
Fitzpatrick IV	4.5		−1.2 to 10.2	1.0	.02		−4.5 to 6.5	3.1
Fitzpatrick V	13.9		7.2 to 20.6	6.7	.08		−0.001 to 13.4	2.1
Fitzpatrick VI	8.7		−3.2 to 20.7	−6.2	−.03		−18.5 to 6.2	1.4
Financial stability (Ref. = not at all difficult)		<.05				<.05		
A little difficult	−7.5		−10.5 to −4.4	−6.2	−.12		−9.2 to −3.2	1.3
Somewhat difficult	−12.9		−16.5 to −9.3	−11.8	−.2		−15.3 to −8.3	1.3
Very difficult	−10.8		−16.8 to −4.8	−10.4	−.1		−16.3 to −4.5	1.1
Extremely difficult	−17.3		−24.4 to −10.1	−15.9	−.12		−22.9 to −8.9	1.1
Effect of previous aesthetic intervention (Ref. = not worn off)	−5.6	<.05	−8.9 to −2.4	−3.4	−.06	<.05	−6.5 to −0.2	1.0
Age, years	.1	.19	−0.04 to 0.2	NA				
Education (Ref. = some or all of high school)		.36						
Completed some or all of college/trade school/university	1.4		−3.3 to 6.1					
Completed some or all of masters/doctoral degree	3.2		−1.9 to 8.3					

β represents the average change in scale score for every 1-unit change in covariate (continuous variables) or the average difference in scores compared with the reference value (categorical variables). β^* denotes standardized coefficient. *P*-value corresponds to Wald test (ie, continuous variables) and the Partial-*F* test (ie, categorical variables) for each β coefficient. Ref. denotes reference value. VIF refers to the variance inflation factor (ie, > 5 was used to denote definite multicollinearity). NA, not applicable.

Table 5. Univariable and Multivariable Linear Regression of FACE-Q Social Scale on Participant Variables

Variable	Univariable regression			Multivariable regression				
	β	*P*-value	95% CI	β	β^*	*P*-value	95% CI	VIF
Age, years	.2	<.05	0.1 to 0.3	.11	.05	.06	−0.004 to 0.21	1.1
BMI (kg/m^2)	−.4	<.05	−0.7 to −0.2	−.33	−.09	<.05	−0.54 to −0.13	1.1
Ethnicity (Ref. = Caucasian)		<.05				<.05		
Black	19.2		14.2 to 24.2	12.2	.13		6.6 to 17.8	1.4
Hispanic/Latino	10.4		1.9 to 19.0	9.7	.06		1.3 to 18.1	1.0
South Asian	4.5		−2.2 to 11.2	3.1	.03		−3.7 to 9.8	1.1
East Asian	−.5		−7.6 to 6.7	−3.5	−.03		−10.5 to 3.6	1.1
Middle Eastern	6.6		−9.5 to 22.7	7.1	.02		−8.5 to 22.7	1.0
Other	−10.4		−22.2 to 1.5	−9.0	−.04		−20.4 to 2.4	1.0
Gender (Ref. = female)	8.6	<.05	5.7 to 11.5	6.3	.12	<.05	3.5 to 9.2	1.1
Country (Ref. = United States)		<.05				<.05		
Canada	−8.5		−13.8 to −3.3	−7.6	−.08		−12.6 to −2.5	1.1
United Kingdom	−5.7		−8.4 to −2.9	−5.5	−.12		−8.1 to −2.8	1.1
Fitzpatrick Scale (Ref. = Fitzpatrick I)		<.05				<.05		
Fitzpatrick II	−.6		−5.9 to 4.7	.2	.003		−5.0 to 5.3	3.5
Fitzpatrick III	3.8		−1.4 to 9.0	3.7	.08		−1.3 to 8.8	3.9
Fitzpatrick IV	6.7		1.1 to 12.2	4.1	.07		−1.3 to 9.6	3.1
Fitzpatrick V	18.7		12.2 to 25.3	13.6	.16		7.1 to 20.2	2.1
Fitzpatrick VI	8.2		−3.6 to 19.9	−4.3	−.02		−16.5 to 7.9	1.4
Financial stability (Ref. = not at all difficult)		<.05				<.05		
A little difficult	−8.0		−11.1 to −5.0	−7.0	−.14		−9.9 to −4.0	1.3
Somewhat difficult	−12.4		−15.9 to −8.8	−11.1	−.19		−14.6 to −7.7	1.3
Very difficult	−13.2		−19.1 to −7.2	−12.7	−.12		−18.6 to −6.9	1.1
Extremely difficult	−13.1		−20.1 to −6.0	−12.2	−.1		−19.1 to −5.3	1.1
Effect of previous aesthetic intervention (Ref. = not worn off)	−3.7	<.05	−7.0 to −0.5	−1.8	−.03	.27	−4.9 to 1.4	1.0
Marital status (Ref. = single, never married)		.06		NA				
Married/common-law	3.1		0.2 to 6.0					
Widowed	12.9		−0.2 to 25.9					
Separated/divorced	.4		−4.1 to 5.0					
Education (Ref. = some or all of high school)		.56						
Completed some or all of college/trade school/university	−1.4		−6.1 to 3.2					
Completed some or all of masters/doctoral degree	.1		−4.9 to 5.2					

β represents the average change in scale score for every 1-unit change in covariate (continuous variables) or the average difference in scores compared with the reference value (categorical variables). β^* denotes standardized coefficient. *P*-value corresponds to Wald test (ie, continuous variables) and the Partial-*F* test (ie, categorical variables) for each β coefficient. Ref. denotes reference value. VIF refers to the variance inflation factor (ie, >5 was used to denote definite multicollinearity. NA, not applicable.

compact dermis, which contributes to the perception of firmer, smoother skin, even as the aging process progresses.[17] Moreover, darker skin tones tend to be less prone to photodamage, a significant factor in premature aging caused by sun exposure.[18] This delay in visible aging and the reduced impact of sun damage may foster a more positive perception of one's appearance in later years, contributing to higher levels of satisfaction among people of color as they age. Further, financial status may also be linked to aging.[19,20] A study revealed that participants who reported elevated levels of financial stress were more likely to be perceived as older than their actual age and exhibited a greater increase in perceived age over time. This association persisted even after accounting for factors, such as income, general stress, health, and physical attractiveness.[20] This study also found that financial independence, such as receiving a pension, was a significant predictor of a more positive perception of one's own aging.[20] Finally, although there has been an increase in the number of men and women seeking aesthetic surgery, in a systematic review, Herruer et al demonstrated that women continue to have increased satisfaction with aesthetic procedures compared with males.[21] This may be because of the theory "SIMON"—single, immature male who is overly expectant and narcissistic, which was proposed by Gorney.[22]

Notably, there has been a paucity of research evaluating the impact of patient variables on FACE-Q Aesthetics scale scores. Luong et al[23] investigated various factors that were associated with satisfaction after upper blepharoplasty and noted that patient characteristics explained only 8% of the variation in their regression model evaluating satisfaction with patient treatment outcomes.[23] Additionally, Hessler et al[24] demonstrated that facial aesthetic patients may be more satisfied with their procedure outcomes if they had poorer HRQL before their treatment.[24] In contrast, limited data have been identified regarding the impact of BMI on aesthetic procedures. Our sample was found to have a mean BMI of 25.7 kg/m^2 which is slightly higher compared with another study that used the FACE-Q to determine outcomes following chin rejuvenation (vs 22.5 kg/m^2).[25] It should be noted that when further analyzing studies included in our research groups, systematic reviews that measured the impact of surgical and nonsurgical interventions, very few studies reported data on BMI for their participants. It is possible that BMI may be a confounder for FACE-Q Aesthetics scale scores; however, further studies examining the impact of BMI are needed to further elucidate this hypothesis.

This analysis has several limitations. Firstly, the demographic and clinical information collected through the survey was self-reported, and independent verification was not possible. Secondly, the sample predominantly comprised individuals who identified as Caucasian, educated, married or in common-law relationships, and residing in North America or the United Kingdom. Therefore, additional studies are necessary to determine whether these findings are applicable to other geographic regions and diverse social contexts. Thirdly, participants voluntarily joined the study through an online platform (www.prolific.com) and received monetary compensation, which may have introduced participation or reporting bias because of the financial incentive.[26] Fourthly, the sample size lacked sufficient power to achieve statistical significance for some variables, such as self-identified race, within the regression analyses. Fifthly, Sinno et al have previously noted that determining satisfaction with aesthetic procedures is exceptionally complex and involves various factors that may determine or influence a patient's satisfaction with a procedure.[27] This raises the question of whether various patient-level factors determine satisfaction with a procedure rather than the technique used for a particular procedure, which is also inherently a limitation of PROM scales. Lastly, because a minimal clinically important difference (MCID) has not yet been established for the FACE-Q Aesthetics Face Overall, Psychological, and Social scales, it remains unclear whether the identified variables result in clinically meaningful differences in outcomes. Future studies investigating distribution or anchor-based methods are required to determine the MCID.

CONCLUSIONS

The FACE-Q Aesthetics scales are validated PROMs developed to assess patient-centered outcomes following facial cosmetic procedures. With the growing adoption of FACE-Q scales, particularly in observational study designs, this exploratory analysis highlights participant characteristics that may act as potential confounders. Identifying these factors is crucial for ensuring proper adjustments in future nonrandomized observational studies utilizing the FACE-Q Aesthetics Face Overall, Psychological, and Social scales. Moreover, the insights gained from this analysis contribute to a deeper understanding of patient-specific variables that influence outcomes after facial aesthetic treatments. These scales are freely available for nonprofit academic and clinical use and can be accessed at https://qportfolio.org/.

Supplemental Material

This article contains supplemental material located online at https://doi.org/10.1093/asj/sjaf027.

Disclosures

Memorial Sloan Kettering Cancer Center (New York, NY) holds the copyright of the FACE-Q Aesthetics and its translations. Drs Cano, Pusic, and Klassen are co-developers of FACE-Q Aesthetics and receive a share of any license revenue associated with its use by for-profit organizations only. Dr Klassen provides research consulting services to the pharmaceutical industry through EVENTUM Research (Hamilton, ON, Canada).

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APPENDIX: Screening questions used in Prolific

AESTHETICS TREATMENTS - FACE	
In the PAST 12 MONTHS, have you been to a DERMATOLOGY or a PLASTIC SURGERY CLINIC to have a FACIAL AESTHETIC treatment?	0, No 1, Yes
In the PAST 12 MONTHS, have you had any of these FACIAL AESTHETIC Treatments: Choose all that apply.	0, NONE 1, BOTULINUM TOXIN A - ie, Botox, Dysport, Xeomin or Jeuveau, Xeomin 2, FILLER - eg, Restylane, Juvederm, Radiesse, Sculptra 3, FAT REDUCTION - eg, Kybella to treat a double chin 4, SKIN BOOSTER (eg, Prophilo) (*asked in field-test screen) 5, PLATELET RICH PLASMA (PRP) injections 6, SKIN TIGHTENING with ultrasound - eg, Ultherapy 7, SKIN TIGHTENING with Radio-frequency - eg, Thermage, Morpheus8, Exilis, Profound RF 8, CHEMICAL PEEL 9, MICRODERMABRASION 10, LASER - eg, CO2, Vbeam, Fraxel 11, INTENSE PULSED LIGHT Light (IPL) - eg, Lynton Lumina IPL 12, MICRONEEDLING

	13, HYDRAFACIAL 14, THREADLIFT 15, Other
You said you had BOTOX injected. What was the MAIN REASON for having BOTOX?	1, Cosmetic reasons - to look better, younger, refreshed 2, Medical reasons - to treat migraines, to stop grinding teeth 3, Other reason 88, None of the above
You said you a SOFT TISSUE FILLER injected. The last time you had filler, where was the filler injected? Choose all that apply	1, Cheeks - to add volume and restore fullness 2, Lips - to plump or to smooth out lip lines 3, Other