

Inequality in Cosmetic Services and Surgery among Iranian Households in 2019: A Decomposition Analysis

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ABSTRACT

Background

The demand for cosmetic surgery is on the rise worldwide, making it the common form of surgery globally while the use of cosmetic surgery being exponentially high in Iran. The aim of this study was to investigate inequality in the use of cosmetic services and surgery (CSS) among Iranian households concerning demographic and socio-economic characteristics.

Methods

This study used data of 38960 Iranian household from the income-expenditure survey of the statistical center of Iran (SCI) in 2019. Concentration index (C) was used to measure inequalities in the use of CSS. Microsoft Excel sheet 2019 was used to extract the data, and the analysis was performed using Stata statistical package version 14.2.

Results

Households with female head, with single head, households with 3 - 4 people, headed with undergraduate education person, households with insurance coverage, with higher socio-economic quintiles, rural households and residents of northwestern Iran were accounted for the highest use of CSS. Also, according to the decomposition analysis, wealth and education level are the two main factors in creating inequality, with wealth, having the highest positive share (88.11%) and education level having the most negative share (-5.26%) in creating measured inequality.

Conclusion

The use of CSS is more concentrated in well-off households in Iran. As the resources of health system are limited, the government and the policy makers should have defined plans with regards to CSS use especially taking factors like socioeconomic status and education status of target groups in to account.

Keywords: Concentration index, Surgery, Social economic, Cosmetic

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INTRODUCTION

According to the American Society of Plastic Surgeons, plastic surgery is defined as a specialized branch of surgery that includes cosmetic surgery and reconstructive surgery. Reconstructive surgery often improves function with no significant changes to appearance, while cosmetic surgery alters the natural appearance ¹, such that they add to

the quality of life². The primary aim of cosmetic surgery is to help people feel more attractive and elevate self-satisfaction³, although the positive effect of cosmetic surgery on improving quality of life and mental health has been controversial in some studies⁴. The demand for cosmetic surgery has been spiking by the day making it a more common procedure globally and especially in Iran is at the top of the list⁵. According to statistics, the rate of Rhinoplasty in Iran is seven times higher than in the United States⁶.

However, cosmetic surgery cannot be discerned as merely a medical issue; Rather, it has become a socio-economic issue⁷. The trend in cosmetic surgeries and services are highly influenced by factors like, socio-cultural conditions, family and friends, beauty standards in society, media advertising, scientific and technological advances in the field of cosmetic medicine and consumerism which in turn has paved the way for a dilemma called the “paradox of health value and beauty value”^{5,8}.

As reported by the American Society of Plastic Surgeons, approximately 13 and 21 million cosmetic surgeries were performed in the United States in 2010 and 2011, respectively, most of them on women in the age group of 24-45³, and most (89%) have been minimally invasive procedures such as Botox injections, fillers, chemical peels and laser hair removal¹. In Iran, limited studies have been performed on surgery and cosmetic interventions and the factors affecting them, reporting that improving self-esteem and self-confidence do significantly affect the tendency to use CSS^{9,10}.

CSS in most countries including Iran although a part of the medical field are not covered by health insurance in spite of the high cost-burden. Therefore, people who use these services must pay directly to providers, so the use of these services is strongly influenced by the financial capacity of the individual or household⁴ and the trend in its use is influenced by demographic and socio-economic factors^{11,12}.

Various studies have confirmed socio-economic disparities in the use of health care and preventive measures^{13,14}. A study has also examined the disparities in the use of surgical interventions especially in terms of accessibility¹⁵. Thus far, no study has examined the prevalence and socio-economic inequalities about the use of CSS, so this study is the first to examine the prevalence and inequality in

the use of CSS among Iranian households based on demographic and socio-economic factors.

METHODS

Data source and variables

Data from the income-expenditure survey of the statistical center of Iran (SCI) in 2019 was used in this study. After data extraction, 20,350 urban and 18,610 rural households from 31 provinces were included in the final analysis. The outcome variable of this study was use of CSS. As health insurance schemes do not cover CSS, the households that have any expenditures for these services considered as utilized households.

To investigate socioeconomic inequality in CSS in households, Principal Components Analysis (PCA) was performed to construct the rank variable of wealth. For this purpose income of household, possession of households for house, car, TV, motorcycle, refrigerator, washing machine, smart phone and other durable goods and also access to internet, water, gas, electricity and other facilities included in PCA to construct wealth index. Then, we categorized households into five quintiles according to the wealth index.

Ethics approval and consent to participate

This study was approved by Research Ethics Committee of Kermanshah University of Medical Sciences (No. IR.KUMS.REC.1398.1062).

Statistical analysis

Inequality measurement

Concentration index (C) was used to measure inequalities in use of CSS in Iranian households. Based on the concentration curve, C is twice the area between equal lines (45-degree line) indicating no inequality and concentration curve. C was measured using the following formula (16):

$$C(S|y) = \frac{2\text{cov}(S_i, R_i)}{\bar{S}} = \frac{1}{n} \sum_{i=1}^n \left[\frac{S_i}{\bar{S}} (2R_i - 1) \right] \quad (1)$$

Where, C is the concentration index, S is the outcome variable (CSS), S_i is use of CSS status of the i^{th} household, R_i is the i^{th} household's fractional rank in the distribution of the household's wealth. The values of C ranges from -1 (here indicating maximal pro-poor inequality in CSS) to +1 (maximal pro-rich inequality in CSS). As cosmetic surgery in the households was a binary outcome, we normalized C

using Wagstaff suggestion by dividing the C to $1-\mu$.

Decomposition analysis

To identify the contribution of socioeconomic and demographic variables to the socioeconomic inequality observed in CSS among Iranian households, C was decomposed (17). If we have a regression model that links outcome variables of this study to a set of k explanatory variables and wealth as:

$$y = \alpha + \sum_k \beta_k x_k + \varepsilon, \quad (2)$$

The C for y can be decomposed as follows:

$$C = \sum_k \left(\frac{\beta_k \bar{x}_k}{\mu} \right) C_k + GC_\varepsilon / \mu. \quad (3)$$

Where β_k is the coefficient of each explanatory variable, \bar{x}_k is the mean of each explanatory variable, C_k is the concentration index for each explanatory variable, GC_ε is the generalized concentration index for ε . The $\sum_k \left(\frac{\beta_k \bar{x}_k}{\mu} \right) C_k$ component in the latest equation shows the proportion of the C explained by the systematic variation of the explanatory variables across wealth groups.

The positive (negative) contribution of an explanatory variable indicates that the socioeconomic distribution of that variable and its relation with outcome variables lead to a higher likelihood of CSS among the rich (the poor). The $\frac{GC_\varepsilon}{\mu}$ component in Equation 3 formula refers to the proportion of inequality which is not explained by the explanatory variables included in the study. Similarly, the following formula was used to decompose normalized concentration index (NC):

$$NC = \frac{C}{1-\mu} = \frac{\sum_k \left(\frac{\beta_k \bar{x}_k}{\mu} \right) C_k}{1-\mu} + \frac{GC_\varepsilon / \mu}{1-\mu} \quad (4)$$

The unit of the analysis was the household level. the outcome variable of the study was use of CSS (0=no and 1=yes). Explanatory variables of this study were sex, age and marital status of the head of household, household size, place of residence (rural/urban), health insurance coverage, education level of head of household, household's wealth, and geographical regions (North, South, West, East, and

Northwest of Iran). The logit model was used to estimate the marginal effect of included variables on CSS in households. All the analyses were performed by Stata software version 14.2 (StataCorp, College Station, TX, USA).

RESULTS

The prevalence of in the use of cosmetic surgery and services among households with a female head was 0.586% and in households with a male head was 0.34%. Households with divorced heads reported the lowest rate of cosmetic surgery with 0.29%. Smaller families (with 1 to 2 people) had the lower CSS (0.34%) compared to households with 3 to 4 people (0.67%). In terms of education, households that their heads had bachelor's degree were frequently users and those with a diploma consumed less of cosmetic service and surgery. In addition, a higher consumption of cosmetic services and surgery was observed in the households covered by insurance (0.57%) compared to uninsured families (0.47%) Rural households (0.58%) compared to the urban households (0.466%) had higher prevalence of CSS. Moreover, the northwest of the country (0.79%) showed the highest use while the eastern part of the country (0.20%) showed the lowest CSS. Pertaining to quintiles of wealth, increased wealth was followed by an increase in the use of cosmetic services and surgeries. It was noted that the richer households frequently used cosmetic services and surgeries and most use (0.75) was, reported by the households with the highest wealth quintile (Table 1).

As per the findings related to inequality in the CSS in Table 2, a higher disproportion in the use of cosmetic surgery and services was observed in households with male heads, with a concentration index of 0.27 than households with female heads, with a concentration index of 0.16. In relation to household size and composition, the lowest concentration index (0.15) was seen in households with 1 to 2 people compared to bigger households. In terms of education, households headed with undergraduate education person displayed the highest inequality with a concentration index of 0.33 and households with heads with diploma education showed the lowest inequality with a concentration index of 0.09. There was less disproportion among uninsured households with a concentration index of 0.07 than households covered by insurance with a concentration index of 0.21. In terms of

Table 1. Descriptive statistics and prevalence of cosmetic services and surgery among Iranian households, 2019

Variables	Total (%)	Cosmetic services and surgery
		Mean (SD)*, %
Sex of head of households		
Female	33789 (86.73)	0.586 (0.076)
Male	5171 (13.27)	0.345 (0.058)
Marriage status of Head of households		
Married	33183 (85.17)	0.590 (0.076)
Separated/widow	5273 (13.53)	0.295 (0.054)
Never married	504 (1.29)	0.941 (0.096)
Household size		
1-2 persons	10229 (26.26)	0.341 (0.058)
3-4 persons	20669 (53.05)	0.672 (0.081)
5 and more persons	8062 (20.69)	0.504 (0.070)
Education level of head of household		
Illiterate	9407 (24.15)	0.406 (0.063)
Undiploma	18283 (46.93)	0.552 (0.074)
Diploma	6372 (16.36)	0.396 (0.062)
Bachelor	3992 (10.25)	1.026 (0.100)
Master of sciences and upper	906 (2.33)	0.495 (0.070)
Having a health insurance		
No	4533 (11.64)	0.468 (0.068)
Yes	34427 (88.36)	0.573 (0.075)
Place of residency		
Rural	20350 (52.23)	0.583 (0.076)
Urban	18610 (47.77)	0.466 (0.068)
Region		
North	8651 (22.20)	0.529 (0.072)
South	7810 (20.05)	0.606 (0.077)
Northwest	6660 (17.09)	0.779 (0.087)
West	7620 (19.56)	0.730 (0.085)
East	8219 (21.10)	0.203 (0.045)
Wealth quintiles		
1st (the poorest)	7792 (20.00)	0.337 (0.057)
2nd	7792 (20.00)	0.359 (0.0598)
3rd	7792 (20.00)	0.482 (0.069)
4th	7792 (20.00)	0.585 (0.076)
5th (the wealthiest)	7792 (20.00)	0.750 (0.086)

*Mean is adjusted based on sample weights

geographical regions, the east of the country had the lowest concentration index equal to -0.21 and the south of the country had the highest concentration index equal to 0.48. The first income quintile group portrayed the lowest concentration index and the second income quintile group portrayed the highest concentration index (Table 2).

The decomposition analysis in Table 3 shows that wealth and education level are the two main factors influencing inequality in the use of cosmetic service and surgery. Thus, wealth has the most positive contribution (88.11%) and educational level has the most negative contribution (-5.26%) on this inequality. In addition to socioeconomic status, household size has the most positive contribution on inequality in the use of cosmetic surgery and services.

DISCUSSION

The aim of this study was to investigate the inequality in the use of cosmetic surgery and services in Iranian households based on demographic and socio-economic characteristics. It is well known that the socio-economic status plays a pivotal role in people's health. In the same way, the use of cosmetic surgery and services can be assessed based on socio-economic status. To date, few authors in their studies have examined the demographic characteristics of recipients of CSS, and no study has examined the prevalence and inequalities in the CSS on a national level in Iran. Moreover, the studies so far have mostly evaluated the attitude and the predictors that influence the use of cosmetic services and services¹⁸⁻²⁸. So what makes the results

Table 2. Normalized Concentration index (C) for inequality in cosmetic services and surgery in Iran by included variables, 2019

variables	C	S.E.	P-value
Sex of head of households			
Female	0.16	0.04	<0.001
Male	0.27	0.14	0.05
Marital status of head of households			
married	0.17	0.04	<0.001
Separated	-0.28	0.17	0.106
widow	0.96	0.32	0.002
Never married	0.58	0.27	0.029
Household size			
1-2 persons	0.15	0.10	0.133
3-4 persons	0.18	0.05	<0.001
5 and more persons	0.11	0.09	0.221
Education level of head of household			
Illiterate	0.14	0.09	0.129
Under diploma	0.09	0.06	0.116
Diploma	0.19	0.12	0.102
bachelor	0.33	0.09	<0.001
Master of sciences and upper	0.30	0.27	0.265
Having a health insurance			
No	0.07	0.13	0.575
Yes	0.22	0.04	<0.001
Region			
North	0.12	0.09	0.158
South	0.48	0.08	<0.001
Northwest	0.04	0.08	0.579
West	0.34	0.08	<0.001
East	-0.21	0.14	0.14
Wealth quintiles			
1st (the poorest)	-0.06	0.11	0.618
2nd	0.29	0.11	0.007
3rd	0.19	0.09	0.04
4th	0.09	0.09	0.284
5th (the wealthiest)	0.15	0.08	0.055

of the present study fascinating is the fact that it is the first to evaluate the inequality in the CSS among Iranian households.

The findings of the present study showed that the highest number of cosmetic surgeries were performed in a female-headed household; this is because the female caregiver being the ultimate decision maker in the family, has a naturally higher tendency to encourage the use of these services. Various studies led by Hormouzi et al.⁹, Salihahmadi¹², Alharethy²⁹, Schlessinger et al.³⁰, Wu et al.²⁴, Nguyen et al.²⁷, and Jovic et al.³¹ confirm that cosmetic surgeries were higher among females than males. The dominance of female attractiveness may explain their naturally higher tendency for cosmetic surgeries.

According to this study, households with single-heads are more likely to use cosmetic services and surgeries than households with married heads. In

addition, the results of the inequality analysis show a significant difference between these two groups. The results of this study are similar to the results of Hormozi et al.⁹, Alharethy²⁹, Schlessinger et al.³⁰, Nguyen et al.²⁷; while the study by Frederick et al.³² is not in line with our findings, depicting that young and single women were less likely to use CSS than married women. Apparently, single people are looking to choose a spouse, so they have elicited a greater tendency to use CSS in order to have more and better choices.

Furthermore, the results of this study portrayed that with higher education, the tendency to use CSS increases. While, the results from inequality analysis showed that educated groups more frequently used CSS than less educated groups. These findings is in line with the results of Hormozi et al.⁹, Salehahmadi Z, Rafie SR¹², Alharethy²⁹, Schlessinger et al.³⁰, and Tranter B, Hanson D²⁵. This can be because

Table 3. Decomposition of wealth-related inequality in cosmetic services and surgery among Iranian households, 2019

Variables	Marginal effects	Mean	Elasticity	C _k	Absolut Contribution	Contribution (%)	SPC
Sex (ref: Female)							
male	-0.003	0.13	0.02	-0.28	-0.007	-3.41	-3.41
Marriage status of Head of households (ref: married)							
Separated/widow	-0.001	0.13	-0.06	-0.262	0.018	9.32	8.58
Never married	0.012	0.01	0.01	-0.137	-0.001	-0.73	
Household size (ref: 1-2 persons)							
3-4 persons	0.000	0.53	0.31	0.216	0.068	35.21	33.08
5 and more persons	0.000	0.2	0.06	-0.06	-0.004	-2.13	
Education level of head of household (ref: Illiterate)							
Under diploma	-0.002	0.46	-0.01	-0.15	0.002	1.09	-5.26
diploma	-0.005	0.16	-0.09	0.27	-0.028	-14.31	
bachelor	-0.002	0.10	0.05	0.45	0.024	12.19	
Master of sciences and upper	-0.006	0.02	-0.01	0.55	-0.008	-4.23	
Health insurance (ref: No)							
Yes	-0.001	0.88	0.04	0.02	0.001	0.66	0.66
Place of residency (ref: rural)							
Urban	0.001	0.47	0.002	-0.55	-0.001	-0.61	-0.61
Region (ref: North)							
South	0.001	0.2	0.02	0.06	0.002	0.85	17.15
Northwest	0.001	0.17	0.07	-0.05	-0.005	-2.38	
West	0.006	0.19	0.05	-0.14	-0.009	-4.39	
East	-0.005	0.21	-0.15	-0.29	0.045	23.07	
Wealth quintiles (ref: 1st)							
2 nd	0.001	0.20	-0.02	-0.71	0.018	9.43	88.11
3 rd	0.002	0.20	0.02	-0.33	-0.007	-3.86	
4 th	0.003	0.20	0.06	0.17	0.011	5.56	
5 th	0.007	0.20	0.14	1	0.149	76.99	
Total observed				138.31			
Residual				-38.31			
Total				100			

Ref= reference, C_k= Concentration Index of dependent variables, AC= Absolute Contribution, SPC=Summed Percentage Contribut

well-educated groups have more exposure to the trends in society and have a higher social status in the community so they tend to prioritize their appearance and draw to cosmetic services and surgeries.

Insured households use CSS more often than households do without health insurance, as confirmed by the studies of Alharethy²⁹ and Schlessinger et al³⁰. In Iran, not every household can afford premiums. Usually those who can afford to pay premiums are families that already do well financially. Since insurance brings down direct costs related to health care, therefore, insured households spend more on CSS. Furtherstill, the decomposition analysis for inequality denoted that wealth and education status are the two most important factors influencing disparity in the use of cosmetic surgery and services. Hence, it was seen that wealth had a more positive (88%) influence while education levels had a more negative influence (-5.26%) in the unequal distribution in

the use of CSS.

Concerning geographical locations, the Northwestern regions showed the highest use and the eastern parts of the country showed the least use of cosmetic surgery and services. Moreover, villagers displayed a higher interest in the use of cosmetic surgery and services compared to city dwellers which is consistent with the results of Hormozi et al.⁹, Alharethy²⁹ and Schlessinger et al³⁰. Villagers have tougher jobs. They are more likely to be exposed to sunlight and physical injuries, which makes them frequent users of cosmetic surgeries and services. In terms of income levels, findings revealed that families with a higher income are frequent users of CSS compared to low income households as stated in the studies of Schlessinger et al.³⁰ and Alharethy²⁹. Since CSS are associated with higher costs, the financial capacity of an individual or household is considered a crucial deciding factor. Finally culture had a powerful effect on tendency of people to CSS in recent decades. Given that Iran is in a sociological and cultural transition, the influence

of other cultures and foreign media can have affected the desire of Iranians to CSS, especially in affluent households.

CONCLUSION

The use of CSS is more concentrated in well-off households in Iran. As the resources of health system is limited, the government and the policy makers are expected to make better plans and solutions with regards to CSS use especially taking factors like socioeconomic status and education status of target groups in to account.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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