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Original Article

Relationship between Socioeconomic Factors and Incidence of Cosmetic Surgery in Tehran, Iran

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Abstract

Background: Cosmetic surgery accompanied with high economic cost is increasing in Iran. It is necessary to be aware about factors affecting cosmetic surgery in order to control its increasing trend. Therefore, we aimed to determine the factors affecting the incidence of cosmetic surgery in Tehran, Iran.

Methods: This survey was conducted on 2002 subjects between the ages of 15 to 60 yr using random digit dialing in Tehran, Iran 2015. Demographic data was collected from all of participants and in the presence of cosmetic surgery, the related cosmetic questions were asked in details. Cosmetic surgery was considered as an event and the incidence rate ratio for variables were estimated. For univariate analysis, Poisson regression was used as well as multi-level Poisson regression was used for multivariate analysis.

Results: Totally, 224 participants (11%) undergone cosmetic surgery. There was a significant relationship between the age at surgery of participants with the incidence of cosmetic surgery (P<0.001). Cosmetic surgery in women was 1.9 times greater than in men (P <0.001). Incidence Rate Ratio (IRR) for the average and wealthy economic status in comparison to poor level was estimated (IRR=5.6, CI%95: 3.64,8.63) and (IRR=3.14, CI%95: 1.93,5.11), respectively. In addition, according to multivariate analysis all variables except the level of education and occupation, had significant relationship with the incidence of cosmetic surgery (P<0.001).

Conclusion: Cosmetic surgery was related to socioeconomic and demographic factors. Given the high economic burden of this unnecessary surgery, it can be effective to emphasize on awareness-raising programs for those are more likely to undergo cosmetic surgery.

Keywords: Plastic surgery; Incidence rate; Socioeconomic factor; Iran

Introduction

Cosmetic surgery is defined as an optional invasive procedure to alter and modify the body shape in the absence of a specific disease, injury or birth defect (1, 2). Increasing public concern about their appearance has led to an increase in cosmetic surgery in both developed and develop-

ing countries (3). American Society of Plastic Surgeons Report in 2016 showed that there were approximately 1.9 million cosmetic surgeries in the United States (4).

Iran is placed in one of the top-ranked countries for cosmetic surgery. The rate of rhinoplasty surgery was 180 per 100,000 people in Iran in 2011(5). Due to the dress code of Iranian women, which limits the visibility of their face in public, rhinoplasty has become the most popular cosmetic surgery, and according to informal sources, Iran has the first rank in the rate of rhinoplasty surgery worldwide(6, 7).

The factors affecting cosmetic surgery in Iran include social and psychological factors as well as demographic factors such as age, gender and educational level (8). Various studies in different countries of the world have shown that age, gender, marital status, and economic status are influencing cosmetic surgery (9, 10). A systematic review also showed that factors such as personality disorders, body image, age, gender, and even smoking and alcohol affect cosmetic surgery (11). The tendency for cosmetic surgery in young people has increased in recent years. In addition, according to studies, the likelihood of undergoing cosmetic surgery in women is higher than men (12, 13). The increasing trend of cosmetic surgeries can be attributed to medical advances, increased cosmetic services, more cosmetic surgeons, lower prices and the spread of media advertisements about cosmetic surgery (14-17).

Cosmetic surgeries have its own consequences (18). In addition to the medical consequences, the economic burden of cosmetic surgery is also a concerning subject. As the number of cosmetic surgery has increased, the expenditure found to be heightened (19). For example, Americans have paid $ 8.6 billion for cosmetic surgery in 2016 (4).

Due to the lack of a population-based study on factors affecting the incidence of cosmetic surgery in Iran, this study was conducted to determine these factors.

Materials and Methods

This cross-sectional study was conducted on 2002 subjects in Tehran, in 2015. The sample size was determined according to the following formula:

$$= \left[\frac{Z_{1-\alpha/2} \times \lambda}{\hat{\lambda} - \lambda}\right]^2$$

The participants were enrolled using Random Digit Dialing (RDD) method and the required information was obtained using telephone and questionnaire. Due to the population of Tehran was very large and in order to achieve a completely random sample from the population, this sampling method was used. At first, a list of all pre-numbers of Tehran was prepared. For each pre-number, four digits were randomly added and the number was called. Area of higher population depending on the number of inhabitants in Tehran have been allocated more pre-numbers and then the samples were entered into the study. Households with no person between the ages of 15 and 60 were excluded from the study .Only residential houses were entered into the study, and commercial units and outbound numbers were excluded.

The Kish method was used for the selection of interviewees in each household. To conduct telephone interviews, this study was approved by the Ethics Committee of Tehran University of Medical Sciences with code IR.TUMS.REC.1394.2140. Calls were not made during certain hours of the day, like early morning or noon. At the beginning of the interview, the objectives of the study were carefully explained by the interviewees. After obtaining the consent of the subjects to participate in the study, demographic data including age, gender, marital status, economic status, occupation and educational level were collected. Then, they were asked whether they had undergone cosmetic surgery or not, if okay the related cosmetic questions were asked in details.

The response rate is low in the telephone interviews, and this is lower if the RDD method is used (20). In order to be sure that every eligible person has chance to be enrolled in the study, each number has been dialed at least three times

during different hours of two days. In addition, we increased the cost and spent more time and made calls at the appropriate hours of the day. However, as expected, some of the samples were not willing to participate in the study, which could affect the generalization of the study.

Phone interview will have a remarkable validity under standard manner (21). Two questioners with high ability in communication and interviewing skills were enrolled from eligible individuals to get reliable information. Then, they were given education. In addition, the questionnaire was tried as short as possible in order to obtain reliable information.

The assets of the family including personal vehicle (not for working and or earning money), freezer, dishwasher, microwave, personal computer, vacuum cleaners, washing machines and LED or LCD television were asked through a principal component analysis to categorize participants into the poor, average and wealthy level. This question was adapted from study of Nedjat et al (22). In this study, for 2002 participants, the number of years being older than 15 yr during 1991-2015 was calculated e.g. the number of years for a 55-yr-old person was 25 yr. Total of these years was considered as time at risk. Number of surgeries during 1991-2015 were considered as events of interest. So, incidence rate ratio (IRR) for variables were estimated using the following formula:

$$IRR=\frac{\text{Rate Ratio in exposed}}{\text{Rate Ratio in unexposed (or less exposed)}}$$

Since the dependent variable in this study was count (cosmetic surgery) and each person could undergo more than one surgery within the study period, Poisson model was applied. Because Sampling was not based on age and sex, direct standardization for age and sex was performed. In order to describe the data, mean, standard deviation and percentage were reported. To investigate the relationship between demographic variables and the incidence of cosmetic surgery, Poisson regression analysis was used and multi-level Poisson regression was used for multivariate analysis.

Results

The response rate was estimated 68%. After excluding the calls to the inactive numbers, non-resident and non- eligible people, 2945 contacts were eligible to include in the study that 2002 subjects (68%) expressed their willing to participate in the study. Regarding gender, 37.8% (756 subjects) of the participants were males and 62.2% (1246 subjects) were females. The mean age of the participants was 37.25 ± 0.5 yr. The age of most participants was between 25 to 29 yr (Table 1).

Totally, 224 participants (11%) undergone cosmetic surgery. Incidence Rate Ratio (IRR) for all variables was calculated. The incidence of cosmetic surgery had a significant relationship with gender (P <0.001). Incidence of cosmetic surgery in women was 1.9 times higher than men.

Age at surgery had a significant relationship with incidence of cosmetic surgery (P <0.001). The incidence of average and wealthy economic status was 5.6 (CI%95:3.64-8.63) and 3.14 (CI%95:1.93-5.11) times higher than poor status, respectively. There was a significant relationship between the incidence of cosmetic surgery and marital status (P <0.001). The incidence of cosmetic surgeries in subjects who were bachelor was approximately 5 (CI%95: 3.75-6.45) times higher than married participants (Table 2).

Based on multivariate analysis, the incidence rate in women was 2.3 times higher than men and all variables except the level of education and occupation, had significant relationship with the incidence of cosmetic surgery (P<0.001) (Table 3).

Table1: Descriptive information participants

Variable	*Number (%)*
Sex	
Male	756 (37.8)
Female	1246 (62.2)
Age (yr)	
15-19	80(4)
20-24	159(7.94)
25-29	381(19.03)
30-34	289(14.44)
35-39	266(13.29)
40-44	244(12.19)
45-49	180 (8.99)
50-54	207(10.34)
55-60	196(9.79)
Marital status	
Single	411(20.5)
Married	1534(76.6)
Divorced	14(0.7)
Widow	43(2.1)
Education	
Illiterate	29(1.4)
Primary school completed	158(7.9)
Less than a diploma	247(12.3)
Diploma	749(37.4)
Associate	249(12.4)
Bachelor	431(21.5)
job	
Government employee	182 (9.1)
manual worker	20 (1)
Nongovernmental employee	172 (8.6)
Self-employed	544 (27.2)
School student	51 (2.5)
University students	86 (4.3)
soldier	1 (0.0004)
housewife	828 (41.1)
Retired	90 (4.5)
Unemployed	28 (1.4)
Socio-economic status	
Poor	668(33.4)
Average	502(25.1)
Wealthy	832(41.6)

Table 2: Non-adjusted analysis of demographic variables

Variable	*Number*	*IRR*	*95% CI*	*P-value*
Sex				<0.001
Male	54	1		
Female	170	1.9	(1.4,2.59)	
Age (yr)	-	0.96	(0.94,0.97)	<0.001
Marital status				<0.001
Married	135	1		
Single	85	4.92	(3.75,6.45)	
Divorced	3	2.43	(0.77,7.63)	
Widow	1	-	-	
Education				<0.001
Less than a diploma	14	1		
Diploma	66	1.66	(0.93,2.96)	
Associate	33	2.90	(1.55,5.43)	
Bachelor	81	4.04	(2.29,7.13)	
Graduate	30	4.36	(2.31,8.22)	
job				<0.001
housewife	83	1		
Government employee	29	1.64	(1.07,2.5)	
manual worker	3	1.36	(0.84,2.23)	
Nongovernmental employee	20	1.5	0.47,4.76)	
Self-employed	63	1.29	(0.93,1.79)	
School student	1	-	-	
University students	21	7.59	(4.7,12.25)	
Unemployed	4	2.57	(0.94,7.02)	
Socio-economic status				<0.001
Poor	24	1		
Average	50	3.14	(1.93,5.11)	
Wealthy	150	5.60	(3.64,8.63)	

IRR: Incidence Rate Ratio
CI: Confidence Interval

Discussion

The aim of this study was to investigate the factors affecting the incidence of cosmetic surgery in Tehran. Based on Poisson regression analysis, variables such as age, gender and socioeconomic status were significantly related to cosmetic surgery.

In this study, a significant statistical relationship was found between age and cosmetic surgery. In many studies, the relationship between demographic variables and cosmetic surgery had not been studied and the demographic data had been presented as descriptive results. In a study conducted in Saudi Arabia, the most frequent cosmetic surgery was reported in the age group of 20 to 40 yr (23). A systematic review showed no relationship between age and cosmetic surgery (11). In Japan, the average age of those who performed cosmetic surgery was 35 yr old (24). According to the American Society of Plastic Surgeons Report, most of the people who had cosmetic surgery in the United States were older compared to the current study (4). Another study on the population of the United States showed the mean age of those had undergone cosmetic

surgery was 45–64 yr (10). In some conducted studies in Iran similar to the current study, the mean age was younger (under 25 yr) than other countries (7, 25). The observed significant relationship between age and the incidence of cosmetic surgery in Iran could be due to the age pyramid of Iran indicating young people and then the rate of cosmetic surgery is very high (6, 25).

Table 3: Adjusted analysis of demographic variables

Variable	*Number*	*IRR*	*95% CI*
Sex			
Male	54	1	
Female	170	2.3	(1.59,3.32)
Age (yr)	-	0.97	(0.95,0.99)
Marital status			
Married	135	1	
Single	85	2.27	(1.60,3.23)
Divorced	3	1.88	(0.59,5.97)
Widow	1	-	-
Education			
Less than a diploma	14	1	
Diploma	66	0.96	(0.53,1.73)
Associate	33	1.07	(0.55,2.07)
Bachelor	81	1.21	(0.65,2.28)
Graduate	30	1.5	(0.75,2.99)
job			
housewife	83	1	
Government employee	29	1.06	(0.65,1.71)
manual worker	3	1.18	(0.36,3.85)
Nongovernmental employee	20	0.65	(0.37,1.12)
Self-employed	63	1.08	(0.7,1.67)
School student	1	-	-
University students	21	1.4	(0.79,2.48)
Unemployed	4	0.96	(0.33, 2.74)
Socio-economic status			
Poor	24	1	
Average	50	2.08	(1.26,3.44)
Wealthy	150	3.59	(2.29,5.64)

IRR: Incidence Rate Ratio
CI: Confidence Interval

In this study, a significant relationship was found between cosmetic surgery and gender. A population-based study in Norway showed that most women underwent cosmetic surgery (26). A study in Japan showed that 68% of those who performed cosmetic surgery were women(24), various studies showed that women undergo more cosmetic surgery more than men in such a way that were consistent with the results of the current study (7, 8, 10, 23, 27). In general, dissatisfaction with the appearance in women is higher than men (28). In countries other than Iran, the proportion of women to men undergoing cosmetic surgery is 9 to 1. However, in the present study as well as in other studies conducted in Iran, it was seen that more men undergo cosmetic surgeries compared to women. This article reflected the tendency of most Iranian men to un-

dergo cosmetic surgery. This difference with other studies can be due to racial differences in their nose and this affects the epidemic of cosmetic surgery among women in Iran.

There was a significant relationship between high educational level and cosmetic surgery. In China, 60% of subjects undergoing cosmetic surgery had collage education (29). In Saudi Arabia, the majority of subjects undergoing cosmetic surgery were graduated from university (23). Studies conducted in Iran showed the same regarding education (7, 27). In the study of Schlesinger et al, most people who had undergone cosmetic surgeries were graduated from university (9). This may be due to the importance of the face and body beauty in people with high levels of education for their advancement in the society.

There was a significant relationship between economic status and cosmetic surgery. In other studies, patients who had undergone cosmetic surgery were better in terms of economic status. In the United States, people who had undergone cosmetic surgery had higher income (10). In Saudi Arabia, the majority of the people undergoing cosmetic surgeries had average income (23). Apparently, cosmetic surgery is unnecessary, someone who undergo it, must not be worry about the cost of the surgery and post-surgery payments.

Most of the patients who had undergone cosmetic surgery were bachelor. In the study of Saudi they were mostly married (23). In China, 57% of the subjects were bachelor (29). In Iran, 60% of subjects were bachelor (27). This can be attributed to this fact that cosmetic surgery is considered as a way to attract more people (6, 23). There was a significant statistical relationship between cosmetic surgery and employment status. The highest frequency of cosmetic surgery was observed in students. According to studies conducted in Iran, friends and classmates are the main motivating sources for cosmetic surgery (30,31).

Limitations of the study

Considering the route of data collection using telephone, most housewives were enrolled in the study. Another limitation was the paucity of people's trust to participate in the study and answering questions. The mentioned limitations were reduced using trained questioners, in such way that the training course included the process of making calls, justifying the participants and gaining their trust for participation, completing the questionnaire and the standard data collection process to prevent information bias. Since, there was not available data on cosmetic surgery in Iran, the information of this study were collected by the researchers.

Conclusion

Demographic factors such as age, sex, economic status and educational level affect the decision to make a cosmetic surgery. Given the high economic burden of this unnecessary surgery, it can be effective to emphasize on awareness-raising programs for those are more likely to undergo cosmetic surgery.

Ethical considerations

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

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Conflict of interest

The authors declare that there is no conflict of interest.

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