ORIGINAL ARTICLE *Van Medical Journal*

Van Med J 31 (3): 239-244, 2024
DOI: 10.5505/vmj.2024. 98752

The Association of Cigarette Smoking With Septorhinoplasty Satisfaction

Canser Yilmaz Demir

Van Yuzuncu Yil University, Faculty of Medicine, Department of Plastic, Reconstructive and Aesthetic Surgery, Van, Türkiye

Abstract

Introduction: It has been reported in the literature that cigarette smoking is associated with otorhinolaryngological diseases. However, literature about the connection of smoking with septorhinoplasty satisfaction is limited. Considering its negative effects on health, I hypothesized that smoking may also negatively affect septorhinoplasty satisfaction. This study aimed to investigate if smoking is associated with septorhinoplasty satisfaction.

Materials and Methods: In the present study, 53 cases with septorhinoplasty were divided into two groups: smokers and non-smokers. The groups were compared for individual and clinical features and septorhinoplasty satisfaction scores. A linear correlation between septorhinoplasty satisfaction and smoking was evaluated. In the assessment of septorhinoplasty satisfaction, the Turkish version of the Rhinoplasty Outcomes Evaluation Questionnaire (ROE-T) was used.

Results: The findings showed that two groups in the present study were similar in age (p=0.886), weight (p=0.099), height (p=0.433), BMI (p=0.257), working status (p=0.511), education levels (p=0.064), single/married (p=1.0), urban/rural (p=1.0), postoperative duration (p=0.985), and also septorhinoplasty satisfaction (p=0.432). The satisfaction scores had no significant correlations with age (p=0.832), weight (p=0.337), height (p=0.652), BMI (p=0.696), smoking intensity (p=0.435), and smoking duration (p=0.551) scores considering all cases with septorhinoplasty. Only, a significant positive correlation was found between septorhinoplasty satisfaction and postoperative duration (r: 0.361; p=0.008).

Conclusion: There was no significant relationship between smoking on septorhinoplasty satisfaction. However, related literature is limited and inconsistent. Therefore, the association of smoking with septorhinoplasty results is worth further investigating.

Key words: Rhinoplasty; patient outcome assessment; patient satisfaction; cigarette smoking.

Introduction

Septorhinoplasty is a common nasal surgery worldwide. It has been found that septorhinoplasty is associated with improved life quality (1). However, the dissatisfaction rate related to septorhinoplasty has been reported as 35% (2). Patient satisfaction after septorhinoplasty is connected with painful periods, nasal dysfunction, and cosmetic issues (3,4). In addition, some anatomic factors have a potential role in septorhinoplasty success (5). However, independent factors underlying dissatisfaction after septorhinoplasty have not been defined completely. Individuals requesting septorhinoplasty may have a variety of motivations for this surgical procedure. Awareness of the patient's specific demands and expectations and paying attention to them can increase septorhinoplasty satisfaction. Nasal functions and appearance are the main topics related to septorhinoplasty expectations (3,4). Although these expectations can affect the satisfaction following septorhinoplasty, some personal characteristics, such as medication, alcohol use, and smoking habit, may play a role in the patient satisfaction after septorhinoplasty. Cigarette smoking is associated with various health conditions, such as cancers (6), cardiovascular diseases (7), ocular diseases (8), reproductive dysfunctions (9), type 2 diabetes mellitus (10), oral health disorders (11), and poor wound healing (12). More specifically and about the present research topic, it has been reported that cigarette smoking is connected with otorhinolaryngological diseases, such as vocal cord and larynx problems, head/neck/thyroid malignancies, chronic sinusitis/rhinitis/pharyngitis, and sleep apnea (13). Moreover, smoking is a predisposing factor to the development of surgical wound infection, poor wound healing, and tissue necrosis following popular aesthetic surgical applications (14,15). Better quality and specific investigations on the relationship of smoking to outcomes after plastic surgical applications are necessary (14). However,

*Corresponding Author: Canser Yilmaz DEMIR, Van Yuzuncu Yil University, Faculty of Medicine, Department of Plastic, Reconstructive and Aesthetic Surgery 65040, Van, Türkiye **E-mail:** canser23@hotmail.com **Orcid:** Canser Yilmaz DEMIR 0000-0002-6715-6515

Received: 22.05.2024, **Accepted:** 03.07.2024

studies assessing the potential negative effect of smoking on septorhinoplasty outcomes are limited, and the potential negative role of smoking in cosmetic surgical procedures remains a source of concern (16,17). In this study, considering the relationship between cigarette smoking and various health conditions, including otorhinolaryngological diseases and aesthetic surgical applications, I hypothesized that smoking may also be a negative factor involved in septorhinoplasty outcome and patient satisfaction related to septorhinoplasty. Accordingly, this study aimed to investigate whether cigarette smoking is associated with septorhinoplasty outcome and satisfaction.

Materials and Methods

This was a retrospective observational study focusing on the relationship between cigarette smoking and septorhinoplasty satisfaction. This study was conducted in the University Hospital, and the Institutional Ethics Committee approved the study protocol (reference number 2024/04-04, date of approval: 19 April 2024). In accordance with the principles of the Declaration of Helsinki, the present study was designed, conducted and completed. Patients who had undergone septorhinoplasty were contacted by telephone, and invited to participate in this study. Those who agreed to participate were included, and their personal data and smoking-related information were evaluated. Participants were asked questions about their demographic characteristics, septorhinoplasty satisfaction, and cigarette smoking. It was noted whether they smoked, if so, for how long, and how many cigarettes they smoked per day. In the assessment of septorhinoplasty outcome and satisfaction the Turkish version of the Rhinoplasty Outcomes Evaluation Questionnaire (ROE-T) was used. This questionnaire is a validated method to assess septorhinoplasty outcomes of Turkish patients (18). The ROE-T Questionnaire evaluates the appearance and functionality of the nose by asking six questions and higher scores means worsen outcomes (18). In the present study, 53 patients who undergone septorhinoplasty were evaluated. The patients were divided into two groups: smokers and non-smokers. Age (19), obesity or body mass index (BMI) (20), education levels (21), urban/rural living (22), and history of cosmetic surgery (23) are potential effective factors on nasal function and appearance, and they can affect septorhinoplasty outcomes. Therefore, these potentially influencing factors were considered when applying inclusion and exclusion criteria. By this means, it was aimed to provide a good homogeneity and to eliminate possible effects of the mentioned factors on comparative results between smoker and non-smoker patients.

The inclusion criteria were as follows:
- Female or male individuals
- Open technique septorhinoplasty (24)
- Postoperative duration ≤10 years
- Written consent to participate in the study
- University/High school graduate

The exclusion criteria were as follows:
- Cases aged <18 or ≥64 years
- Habits/addictions other than smoking
- Revision septorhinoplasty
- Class II-III obesity (BMI≥35)
- Primary school graduate
- Former smoker
- Psychiatric disorders
- Wound healing disorders

Ethical approval: The Institutional Ethics Committee approved the study protocol (reference number 2024/04-04, date of approval: 19 April 2024).

Statistical analysis: The variables in the two groups were assessed and compared using statistical analyses. Statistical analyses were performed with IBM SPSS Statistics version 27.0. Using the Kolmogorov-Smirnov test, it was determined if continuous variables showed a normal distribution. Accordingly, the satisfaction, weight, height, BMI, and smoking intensity scores were found to be normally distributed in the smoker group, and the satisfaction, weight, height, and postoperative duration scores were normally distributed in the non-smoker group. The scores of other continuous variables were normally distributed in the groups. Considering all participants as one group, the satisfaction, weight, and BMI scores were normally distributed, but other continuous variables were found to be non-normally distributed. The parametric (Student's *t*-test and Pearson test) and non-parametric (Mann-Whitney U and Spearman) tests were applied for normally and non-normally distributed variables, respectively. The Fisher's exact test was applied to compare categorical variables between groups. Continuous and categorical variables were given as Mean±SD (min.-max.) and number (percentage), respectively. A statistically significant level was considered as 5%.

Results

Table 1 presents the individual and clinical characteristics of the participants: [n=53, age: 32.28±7.78 (22-50) years; Female/Male: 33/20; Weight: 66.53±9.27 (52-90) kg; Height: 1.67±0.08 (1.54-1.85) m; BMI: 23.67±2.37 (18.34-32.05); Working/Not-working: 40/13; University/High school: 35/18; Single/Married: 31/22; Urban/Rural: 53/0; Postoperative duration: 3.35±2.78 (0.1-10) years; Septorhinoplasty satisfaction:16.02±5.30 (5-24); Smoker rate: 32.08%; Smoking intensity: 3.45±6.16 (0-20)/day; Smoking duration: 3.25±6.34 (0-30) years] (Table 1). Table 2 presents the statistical comparisons between smoker and non-smoker patients according to individual and clinical characteristics and septorhinoplasty satisfaction. The two groups were statistically similar in terms of age (p=0.886), weight (p=0.099), height (p=0.433), BMI (p=0.257), working status (p=0.511), education levels (p=0.064), Single/Married (p=1.0), Urban/Rural (p=1.0), postoperative duration (p=0.985), and septorhinoplasty satisfaction (p=0.432). Only, smoker group exhibited statistically significant higher rate of male gender (p=0.038) than non-smoker group (Table 2).

Table 1: Individual characteristics of the participants.

Parameters	Septorhinoplasty Cases (n=53)
Age, years	32.28±7.78 (22-50)
Female/Male	33/20
Weight, kg	66.53±9.27 (52-90)
Height, m	1.67±0.08 (1.54-1.85)
BMI, kg/m²	23.67±2.37 (18.34-32.05)
Working/Not-working	40/13
University/High school	35/18
Single/Married	31/22
Urban/Rural	53/0
Primary/Revision septorhinoplasty	53/0
Postop. duration, years	3.35±2.78 (0.1-10)
Septorhinoplasty satisfaction	16.02±5.30 (5-24)
Smoker rate, n (%)	17 (32.08%)
Smoking intensity, n/day	3.45±6.16 (0-20)
Smoking duration, years	3.25±6.34 (0-30)

Values were expressed as Mean±SD (min.-max.) or number.

Table 2: Comparing individual features and septorhinoplasty satisfaction between smoker and non-smoker patients.

Parameters	Smoker Patients (n=17)	Nonsmoker Patients (n=36)	p
Age, years	32.12±8.19 (22-45)	32.36±7.69 (22-50)	0.886*
Female/Male	7/10	26/10	0.038**
Weight, kg	69.59±10.22 (52-85)	65.08±8.56 (52-90)	0.099***
Height, m	1.69±0.10 (1.55-1.81)	1.67±0.07 (1.54-1.85)	0.433***
BMI, kg/m²	24.39±3.00 (19.57-32.05)	23.32±1.97 (18.34-26.30)	0.257*
Working/Not-working	14/3	26/10	0.511**
University/High school	8/9	27/9	0.064**
Single/Married	10/7	21/15	1.0**
Urban/Rural	17/0	36/0	1.0**
Primary/Revision	17/0	36/0	1.0**
Postop. duration, years	3.34±2.86 (0.5-9.0)	3.35±2.78 (0.1-10)	0.985***
Septorhinoplasty satisfaction	15.18±4.82 (5-22)	16.42±5.53 (6-24)	0.432***

Septorhinoplasty satisfaction: the scores of Rhinoplasty Outcomes Evaluation Questionnaire;
Values were expressed as Mean±SD (min.-max.) or number.
*****The Mann-Whitney U test
****** The Fisher's exact test
*******The Student's *t*-test

Table 3 presents the statistical correlations of the satisfaction scores with other participant scores. The satisfaction scores exhibited no statistically significant correlations with age (p=0.832), weight (p=0.337), height (p=0.652), BMI (p=0.696), smoking intensity (p=0.435), and smoking duration (p=0.551) scores considering all cases with septorhinoplasty. However, there

Table 3: Correlations of septorhinoplasty satisfaction scores with other scores.

Groups		Age (years)	Weight (kg)	Height (m)	BMI (kg/m^2)	Smoking intensity (n/day)	Smoking duration (years)	Postop. duration (years)
Smokers (n=17)	r	0.284	-0.097	-0.323	0.233	-0.031	0.255	0.158
	p	0.270*	0.710**	0.205**	0.368**	0.907**	0.324*	0.546*
Non-smokers (n=36)	r	-0.102	-0.122	0.029	-0.174	N/A	N/A	0.348
	p	0.556*	0.478**	0.869**	0.310*			0.037**
All patients (n=53)	r	0.030	-0.134	-0.063	-0.055	-0.110	-0.084	0.361
	p	0.832*	0.337**	0.652*	0.696**	0.435*	0.551*	0.008*

Septorhinoplasty satisfaction: the scores of Rhinoplasty Outcomes Evaluation Questionnaire.
***The Spearman test**
****The Pearson test**

was a significant positive correlation between septorhinoplasty satisfaction and postoperative duration (r: 0.361; p=0.008) (Table 3).

Discussion

This study focused on the possible connection of cigarette smoking with septorhinoplasty satisfaction. The study was performed to test the hypothesis that cigarette smoking may be negatively connected with septorhinoplasty satisfaction. It was found that there was no significant relationship between smoking and septorhinoplasty satisfaction. However, it should be considered that studies on the research topic are few and have some limitations. To date, studies evaluating the potential negative effect of smoking on septorhinoplasty outcomes are limited, and the potential negative role of smoking in cosmetic surgical procedures remains a source of concern (16,17). Previous studies have shown that smokers have impaired mucociliary clearance and longer mucociliary clearance time relative to non-smokers (25-27). Indeed, cigarette smoking is also clinically associated with otorhinolaryngological diseases and has a predisposing effect on the emerge of infection and poor healing in surgical wound, and tissue necrosis after common plastic surgical interventions (13-15). Therefore, a study on the relationship between smoking and outcomes of plastic surgical interventions can be conducted (14). In this line, the current study tested the hypothesis that smoking may be related to septorhinoplasty satisfaction. However, the study results did not yield any evidence supporting the hypothesis tested, consistent with the results obtained from the previous studies (16,28). In addition, compatible with our results, Layliev et al. (29) have reported that smoking status is not associated with major complications in aesthetic rhinoplasty. On the other hand, Cetiner et al. (30) have found that smoker septoplasty cases have longer nasal recovery time and increased frequency of septal perforation. Therefore, it should be accepted that there is limited and inconsistent findings in the literature related to the reseach topic.

Study limitations: The present study has various limiting features that should be considered. First of all, it should be noted that this study is the experience of single-center and also has low number of cases. These features can decrease the generalizability and reliability of the findings. Another limitation is that this study focused solely on the satisfaction related to nasal function and appearance following septorhinoplasty in relation to smoking. However, other potential health problems associated with smoking, such as wound complications, difficulties during and post-surgery, and surgeon satisfaction were not

addressed in this study. In addition, the lack of sufficient and consistent data on the research topic may lead to discussions and inferences that were not strong enough. On the other hand, thanks to the strict inclusion and exclusion criteria, a good homogeneity emerged in the present study. The smoker and non-smoker groups showed similarity in terms of potential influencing factors on septorhinoplasty rather than smoking. That is, the two groups had similar rates of potential influencers, such as age (19), obesity or body mass index (BMI) (20), education levels (21), urban/rural living (22), and revision or cosmetic surgery (23). Thus, the possible influences of these factors were excluded, and only the effect of smoking could be observed as much as possible in the present study. However, the two groups had gender difference, and considering gender difference in nasal features, I cannot eliminate the possible role of this factor in the results of this study. In conclusion, there was no significant relationship between smoking on septorhinoplasty satisfaction. However, current literature presents limited and inconsistent findings about the potential negative effects of smoking on septorhinoplasty satisfaction and outcomes. Therefore, the association of smoking with septorhinoplasty results is worth further investigating.

Acknowledgment: The author would like to extend his gratitude and acknowledgement to all the patients and controls for their participation in this study.

Ethical consent: The Institutional Ethics Committee approved the study protocol (reference number 2024/04-04, date of approval: 19 April 2024).

Conflict of interest: The author reports no conflicts of interest in this work.

Financial disclosure: The author has declared that there is no financial support.

Data sharing statement: The data that support the findings of this study are available from the corresponding author upon reasonable request.

Author contribution: Study design, data collection and processing, analyzing and writing (CYD).

References

1. Chen K, Zhou L. The Effect of Functional Rhinoplasty on Quality of Life: A Systematic Review and Meta-Analysis. Aesthetic Plast Surg 2024; 48(5): 847-854.
2. Ghorbani F, Ahmadi H, Davar G. Patient dissatisfaction following rhinoplasty: a 10-year experience in Iran. Maxillofac Plast Reconstr Surg 2023; 45(1):7.
3. Gadkaree SK, Shaye DA, Occhiogrosso J, Lee LN. Association Between Pain and Patient Satisfaction After Rhinoplasty. JAMA Facial Plast Surg 2019; 21(6): 475-479.
4. Kemal Ö, Tahir E, Kavaz E, Karabulut H. Impact of Functional and Aesthetic Factors on Patient Satisfaction in Septorhinoplasty. Turk Arch Otorhinolaryngol 2022; 60(1): 36-41.
5. Serifoglu I, Oz İİ, Damar M, Buyukuysal MC, Tosun A, Tokgöz Ö. Relationship between the degree and direction of nasal septum deviation and nasal bone morphology. Head Face Med 2017;13(1):3.
6. Liu Y, Lu L, Yang H, Wu X, Luo X, Shen J, et al. Dysregulation of immunity by cigarette smoking promotes inflammation and cancer: A review. Environ Pollut 2023; 339: 122730.
7. Ishida M, Sakai C, Kobayashi Y, Ishida T. Cigarette Smoking and Atherosclerotic Cardiovascular Disease. J Atheroscler Thromb 2024; 31(3): 189-200.
8. Kulkarni A, Banait S. Through the Smoke: An In-Depth Review on Cigarette Smoking and Its Impact on Ocular Health. Cureus 2023; 15(10): e47779.
9. Osadchuk L, Kleshchev M, Osadchuk A. Effects of cigarette smoking on semen quality, reproductive hormone levels, metabolic profile, zinc and sperm DNA fragmentation in men: results from a population-based study. Front Endocrinol (Lausanne) 2023; 14: 1255304.
10. Titova OE, Baron JA, Fall T, Michaëlsson K, Larsson SC. Swedish Snuff (Snus), Cigarette Smoking, and Risk of Type 2 Diabetes. Am J Prev Med 2023; 65(1): 60-66.
11. Huang Q, Wu X, Zhou X, Sun Z, Shen J, Kong M, et al. Association of cigarette smoking with oral bacterial microbiota and cardiometabolic health in Chinese adults. BMC Microbiol 2023; 23(1): 346.
12. McDaniel JC, Browning KK. Smoking, chronic wound healing, and implications for evidence-based practice. J Wound Ostomy Continence Nurs 2014; 41(5): 415-23.
13. Wang X, Bi Y, Liu G, Wang W, Cui H. Smoking and alcohol consumption with the risk of 11 common otolaryngological diseases: a bidirectional Mendelian randomization. Eur Arch Otorhinolaryngol 2023; 280(12): 5615-23.

14. Theocharidis V, Katsaros I, Sgouromallis E, Serifis N, Boikou V, Tasigiorgos S, et al. Current evidence on the role of smoking in plastic surgery elective procedures: A systematic review and meta-analysis. J Plast Reconstr Aesthet Surg 2018; 71(5): 624-636.
16. Erol O, Koycu A. The Effect of Smoking on Septoplasty and Septorhinoplasty Outcomes. Aesthetic Plast Surg 2022; 46(3): 1378-1384.
17. Lin SJ, Hassell NE. Invited Discussion on: "The Effect of Smoking on Septoplasty and Septorhinoplasty Outcomes". Aesthetic Plast Surg 2022; 46(3): 1385-1387.
18. Çelik M, Altıntaş A. The Turkish Version of the Rhinoplasty Outcomes Evaluation Questionnaire: Validation and Clinical Application. Balkan Med J 2019; 36(2): 129-133.
19. Balázs A, Millar-Büchner P, Mülleder M, Farztdinov V, Szyrwiel L, Addante A, et al. Age-Related Differences in Structure and Function of Nasal Epithelial Cultures From Healthy Children and Elderly People. Front Immunol 2022; 13: 822437.
20. Rodrigues MM, Carvalho PHA, Gabrielli MFR, Lopes RN, Garcia Junior OA, Pereira Filho VA, et al. How obesity affects nasal function in obstructive sleep apnea: anatomic and volumetric parameters. Braz J Otorhinolaryngol 2022; 88(3): 296-302.
21. Rezaei F, Rezaei F, Abbasi H, Moradi H. A Comparison of Doctor/Patient Satisfaction with Aesthetic Outcomes of Rhinoplasty: a Prospective Study. J Med Life 2019; 12(4): 374-380.
22. Christensen SH, Timm S, Janson C, Benediktsdóttir B, Forsberg B, Holm M, et al. A clear urban-rural gradient of allergic rhinitis in a population-based study in Northern Europe. Eur Clin Respir J 2016; 3: 33463.
23. Luong KP, Slijper HP, Stubenitsky B, Hummelink S, Ulrich DJO. Changes in
15. Bouhadana G, El Hawary H, Alam P, Gilardino MS. A Procedure and Complication-Specific Assessment of Smoking in Aesthetic Surgery: A Systematic Review and Meta-Analysis. Plast Surg (Oakv) 2024; 32(1): 115-126.
patient-reported satisfaction and quality-of-life 6 months after rhinoplasty. J Plast Reconstr Aesthet Surg 2024; 91: 325-334.
24. Başer E, Kocagöz GD, Çalim ÖF, Verim A, Yilmaz F, Özturan O. Assessment of Patient Satisfaction With Evaluation Methods in Open Technique Septorhinoplasty. J Craniofac Surg 2016; 27(2): 420-424.
25. Prasetyo A, Sadhana U, Budiman J. Nasal Mucociliary Clearance in Smokers: A Systematic Review. Int Arch Otorhinolaryngol 2021; 25(1): e160-e169.
26. Chethana R, Mishra P, Kaushik M, Jadhav R, Dehadaray A. Effect of Smoking on Nasal Mucociliary Clearance. Indian J Otolaryngol Head Neck Surg 2022; 74(Suppl 2): 956-959.
27. Mahmud A, Salisu AD, Kolo ES, Hasheem MG, Bello-Muhammad N, Tukur AR, et al. Impact of smoking on nasal mucociliary clearance time in Kano metropolis, Nigeria. World J Otorhinolaryngol Head Neck Surg 2022; 9(1): 53-58.
28. Yazici ZM, Sayin I, Erdim I, Gunes S, Kayhan FT. The effect of tobacco smoking on septoplasty outcomes: a prospective controlled study. Hippokratia 2015; 19(3): 219-224.
29. Layliev J, Gupta V, Kaoutzanis C, Ganesh Kumar N, Winocour J, Grotting JC, et al. Incidence and Preoperative Risk Factors for Major Complications in Aesthetic Rhinoplasty: Analysis of 4978 Patients. Aesthet Surg J 2017; 37(7): 757-767.
30. Cetiner H, Cavusoglu I, Duzer S. The effect of smoking on perforation development and healing after septoplasty. Am J Rhinol Allergy 2017; 31(1): 63-65.