Open Access

ISSN: 2663-9491 e-ISSN: 2789-6897

ORIGINAL ARTICLE

A Comparison of Post-operative Infection Between Short Stay and Long Stay Patients in the Department of Oral and Maxillofacial Surgery Patients

DOI: 10.5281/zenodo.18549781

Mozammel Haque[1], Rezaul Islam[2], Mohammad Mahmudur Rahman[3], Uday Kumar Goswami[4], Rakibul Hasan[5], Mohammed Ayaz Ahmed[6]

Received: 26 Jan 2026
Accepted: 29 Jan 2026
Published Online: 9 Feb 2026

Published by:
Gopalganj Medical College, Gopalganj, Bangladesh

Correspondence to
Mozammel Haque

ABSTRACT

Background: *Oral and maxillofacial surgery (OMFS) patients are at risk of postoperative infection due to the oral microbial environment and the need for hospitalization. Longer hospital stays are associated with higher infection risk and increased morbidity. However, the effect of hospitalization duration on postoperative infection in OMFS patients in Bangladesh is unclear. This study compares infection rates between short- and long-stay OMFS patients and identifies factors associated with infection risk.* ***Methods & Materials:*** *This hospital-based comparative observational study was conducted in the Department of Oral and Maxillofacial Surgery, Dhaka Medical College Hospital, from January 2025 to December 2025. 90 adult patients undergoing major OMFS procedures were grouped into short stay (≤7 days) and long stay (>7 days). Data were analyzed using chi-square tests and logistic regression in SPSS v26, with p<0.05 considered significant. Ethical approval and informed consent were obtained.* ***Results:*** *90 OMFS patients were studied, with equal numbers in short- and long-stay groups. Most patients were aged 36–55 years and male. Cystic lesions and oral cancer were the most common diagnoses. Postoperative infection occurred in 43.3% of patients and was significantly higher in long-stay patients than short-stay patients (62.2% vs 24.4%, p<0.001). Diabetes mellitus and oral cancer were significantly associated with infection. Multivariate analysis showed long hospital stay, diabetes mellitus, and oral cancer as independent predictors of postoperative infection.* ***Conclusion:*** *Postoperative infection was significantly higher in long-stay OMFS patients. Prolonged hospital stays, diabetes mellitus, and oral cancer were key predictors of infection, highlighting the need for early discharge planning and careful management of high-risk patients.*

Keywords: *Post-operative Infection, Short Staying, Long Staying, Oral and Maxillofacial Surgery*

(The Insight 2025; 8(4): 955-959)

1. *Assistant professor, Department of Oral and Maxillofacial Surgery, Dhaka Medical College & Hospital, Dhaka, Bangladesh (ORCID: 0009-0000-4557-8998)*
2. *Associate Professor, Department of Oral and Maxillofacial Surgery, Dhaka Medical College & Hospital, Dhaka, Bangladesh (ORCID: 0009-0008-0952-9759)*
3. *Assistant Registrar, Department of Oral and Maxillofacial Surgery, Dhaka Medical College and Hospital, Dhaka, Bangladesh (ORCID: 0009-0007-9672-0166)*
4. *Associate Professor, Department of Oral and Maxillofacial Surgery, Dhaka Medical College & Hospital, Dhaka, Bangladesh (ORCID: 0009-0002-3337-3228)*
5. *Consultant, Department of Oral & Maxillofacial Surgery Center, Bangladesh Multicare Hospital, Dhaka, Bangladesh (ORCID: 0009-0005-3366-4860)*
6. *Associate Professor, Department of Oral and Maxillofacial Surgery, Dhaka Medical College & Hospital, Dhaka, Bangladesh (ORCID: 0009-0004-6893-0957)*

INTRODUCTION

Oral and maxillofacial surgery (OMFS) involves diagnosing and treating diseases of the face, mouth, jaws, and neck. Many patients require hospitalization, yet data on OMFS in-patient numbers and length of stay (LOS) remain limited [1]. Antibiotic prophylaxis is commonly used in oral and maxillofacial (OMF) surgeries to prevent surgical site infections, as these procedures involve mucosal tissues rich in aerobic and anaerobic bacteria, making them prone to postoperative infections [2]. Patients with an American Society of Anesthesiology (ASA) score of ≥3 or those undergoing procedures under general anesthesia lasting more than 90 minutes are not suitable for day surgery and should be admitted for overnight hospitalization [3]. Long hospital stays in OMSI impact patients and care, while machine learning can help predict risks and optimize treatment to reduce hospitalization [4].

Worldwide, studies indicate a definitive connection between surgical site infections (SSIs) and extended hospital stays in various surgical specialties, including operations related to the head, neck, and maxillofacial area. Extensive retrospective cohort research (e.g., examination of more than 4,000 patients undergoing intricate head and neck surgeries) revealed that individuals who experienced SSIs had notably extended

postoperative hospital stays compared to patients who did not have infections, with the infection being a critical element that postponed discharge [5]. A different global systematic review emphasizes that SSIs impact roughly 11% of patients undergoing general surgery, with these infections linked to longer hospital stays, increased morbidity, and higher healthcare expenses globally [6]. Moreover, research in general surgical populations indicates that longer preoperative or prolonged hospital stays are linked to an increased risk of SSIs, and patients experiencing SSIs generally necessitate more hospitalization days than those without, highlighting the impact of postoperative infections on LOS [7]. Additional research indicates that surgical site infections (SSIs) considerably extend hospital admissions and elevate healthcare expenses, as affected patients typically endure stays that are 7–10 days longer compared to those without infections [8].

The study in Bangladesh found that long-term hospitalized patients had a significantly higher prevalence of oral opportunistic pathogens, such as *Pseudomonas aeruginosa* and *Candida albicans*, compared to short-stay patients, with risks linked to age, malnutrition, comorbidities, and poor oral hygiene [9]. The impact of hospitalization duration on postoperative infection in OMFS patients in Bangladesh remains unclear, with factors like comorbidities, nutrition, and oral hygiene yet to be studied together as predictors of infection risk. The aim of this study was to compare the incidence of postoperative infections between short-stay and long-stay patients undergoing oral and maxillofacial surgery and to identify factors associated with increased infection risk related to the duration of hospitalization.

METHODS & MATERIALS

Study design and setting

This was a hospital-based comparative observational study conducted in the Department of Oral and Maxillofacial Surgery (OMFS), Dhaka Medical College Hospital. The study was carried out over a one-year period from January 2025 to December 2025.

Study population

The study included patients admitted to the OMFS department of Dhaka Medical College Hospital who underwent oral and maxillofacial surgical procedures during the study period. Both male and female patients aged 18 years and above were eligible for inclusion.

Inclusion criteria

- Patients undergoing major oral and maxillofacial surgery requiring postoperative hospitalization
- Age ≥18 years
- Patients willing to participate and provide informed consent
- Patients staying in hospital for at least 48 hours post-surgery

Exclusion criteria

- Patients with pre-existing surgical site infection at admission
- Patients receiving immunosuppressive therapy or chemotherapy
- Patients with known HIV infection or severe systemic infection
- Patients who died or were referred within 48 hours after surgery

Sample size and sampling technique

A total of 90 patients were enrolled using a purposive sampling technique. Patients were categorized into two groups based on their postoperative length of hospital stay (LOS):

- **Short-stay group:** ≤7 days (n = 45)
- **Long-stay group:** >7 days (n = 45)

Data collection procedure

Data were collected using a structured data collection sheet through patient interviews, clinical examinations, and hospital records. The following information was recorded:

- Socio-demographic variables (age, sex, occupation)
- Clinical diagnosis (tumor, cyst, fracture, oral cancer, TMJ disorder)
- Comorbid conditions (diabetes mellitus, hypertension, asthma, others)
- Duration of hospital stay
- Occurrence of postoperative infection

Outcome variables

- The primary outcome was the occurrence of postoperative infection.
- The main exposure variable was length of hospital stay (short vs long stay).
- Other covariates included age, sex, diagnosis, and comorbidities.

Statistical analysis

Data were entered and analyzed using SPSS version 26. Categorical variables were expressed as frequency and percentage. The Chi-square test was used to assess associations between categorical variables and postoperative infection. Binary logistic regression was performed to identify independent predictors of postoperative infection. Results were expressed as odds ratios (OR) with 95% confidence intervals (CI). A p-value <0.05 was considered statistically significant.

Ethical considerations

Ethical approval was obtained from the Ethical Review Committee of Dhaka Medical College Hospital. Written informed consent was obtained from all participants. Confidentiality and anonymity were strictly maintained throughout the study.

RESULTS

A total of 90 patients who underwent oral and maxillofacial surgical procedures were included in the study. Patients were equally divided into short-stay (≤7 days) and long-stay (>7 days) groups, with 45 patients in each group.

Socio-demographic characteristics

Table I shows the majority of patients belonged to the 36–55 years age group (40.0%), followed by those aged >55 years (31.1%). Patients aged 21–35 years and ≤20 years comprised 16.7% and 12.2%, respectively. Most participants were male (64.4%), while 35.6% were female. Regarding occupation, service holders constituted the largest group (43.3%), followed by housewives (26.7%), others (16.7%), and students (13.3%).

Table – I: Socio-demographic Characteristics of the Study Participants (*n* = 90)

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	≤20	11	12.2
	21–35	15	16.7
	36–55	36	40.0

ISSN: 2663-9491 e-ISSN: 2789-6897

	>55	28	31.1
Gender	Male	58	64.4
	Female	32	35.6
Occupation	Student	12	13.3
	Housewife	24	26.7
	Service	39	43.3
	Others	15	16.7

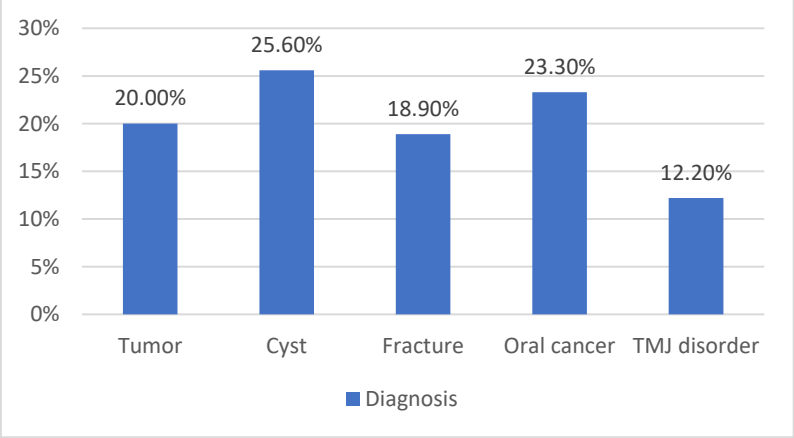

Figure – 1: Distribution of OMFS Conditions (*n* = 90)

Distribution of OMFS conditions

Figure 1 shows that the clinical diagnoses of the study participants. Cystic lesions (25.6%) were the most common condition, followed by oral cancer (23.3%), tumors (20.0%), fractures (18.9%), and temporomandibular joint (TMJ) disorders (12.2%).

Comorbidities and infection

Table II presents among the 39 infected patients, diabetes mellitus was the most frequent comorbidity, with 59.5% of diabetic patients developing infection. This association was statistically significant (p = 0.004). Patients with no comorbidity had a significantly lower infection rate (17.6%, p < 0.001). Hypertension and asthma showed higher infection rates, but these associations were not statistically significant.

Table – II: Infection Rate by Comorbidity

Comorbidity	Infected (n=39)	Not infected (n=51)	Infection rate (%)	p-value
Diabetes mellitus	22	15	59.5	0.004*
Hypertension	14	11	56.0	0.072
Asthma	8	6	57.1	0.089
No comorbidity	6	28	17.6	<0.001*

A p-value <0.05 was considered statistically significant.

Hospital stays and postoperative infection

Table III shows postoperative infection was observed in 39 patients (43.3%). The long-stay group (>7 days) had a much higher infection rate (28 out of 45 patients; 62.2%) compared with the short-stay group (11 out of 45 patients; 24.4%). This difference was highly statistically significant (p < 0.001), indicating a strong association between prolonged hospital stay and postoperative infection.

Table – III: Association Between Length of Hospital Stay and Post-operative Infection

Hospital stays	Infection Present	Infection Absent	Total	P-value
Short stay (≤7 days)	11	34	45	<0.001
Long stay (>7 days)	28	17	45	
Total	39	51	90	

A p-value <0.05 was considered statistically significant.

Predictors of postoperative infection

Table IV shows binary logistic regression analysis identified long hospital stay, diabetes mellitus, and oral cancer as independent predictors of postoperative infection. Patients staying more than 7 days had 4.72 times higher odds of developing infection compared to short-stay patients (p = 0.001). Diabetic patients had 3.10 times higher odds of infection (p = 0.010), and patients with oral cancer had 2.68 times higher odds (p = 0.027). Age above 55 years and male gender were not significantly associated with postoperative infection.

ISSN: 2663-9491 e-ISSN: 2789-6897

Table – IV: Multivariate Analysis of Risk Factors for Post-operative Infection (Binary Logistic Regression)

Variable	Adjusted OR	95% CI	p-value
Long hospital stays (>7 days)	4.72	1.95 – 11.40	0.001*
Diabetes mellitus	3.10	1.30 – 7.42	0.010*
Oral cancer	2.68	1.12 – 6.41	0.027*
Age >55 years	1.94	0.82 – 4.62	0.129
Male gender	1.21	0.53 – 2.79	0.654

A p-value <0.05 was considered statistically significant.

DISCUSSION

In our study, most of the participants were middle-aged individuals (36–55 years, 40.0%) and predominantly male (64.4%). In contrast, Zhang et al. (2025) found that 58% of patients were male and 62% were under the age of 60, suggesting a similar prevalence of middle-aged males in cases of oral and maxillofacial infections [10]. In this study, service providers formed the largest segment (43.3%), followed by homemakers (26.7%) and learners (13.3%). In the same way, Alansaari et al. (2023) found that 77% of dental patients were working, 14% were without jobs, and 9% were students, emphasizing that those employed make up the largest portion of patients seeking oral healthcare, although percentages differ based on the population and context [11].

In this study, cystic lesions (25.6%) were the most prevalent OMFS issue, succeeded by oral cancer (23.3%), tumors (20.0%), fractures (18.9%), and TMJ conditions (12.2%). In a similar manner, a retrospective study by Bassey et al. (2021) indicated that odontogenic cysts made up 26.3%, tumors 21.5%, and oral cancers 19.8% of maxillofacial lesions, reflecting a similar prevalence pattern. These results indicate that cystic lesions and tumors consistently account for the majority of OMFS diagnoses, whereas fractures and TMJ disorders make up smaller yet clinically important proportions [12].

In this study, diabetic individuals exhibited the highest infection rate (59.5%), whereas those without comorbidities showed a lower rate (17.6%). Hypertension (56.0%) and asthma (57.1%) were elevated, yet not statistically significant. In the same way, Amirah et al. (2024) discovered that diabetes increased the risk of infection at the surgical site (OR = 2.22), while Zhang et al. (2025) noted that 58% of diabetics experienced postoperative infection compared to 20% without comorbid conditions, establishing diabetes as a significant predictor [10,13].

The long-stay group (>7 days) had a significantly higher rate of postoperative infection (62.2%) compared to the short-stay group (≤7 days, 24.4%). In the same vein, Suenaga et al. (2023) noted that extended hospital stays were closely linked to postoperative infections, with the likelihood of infection increasing significantly for stays of 7 days or more (OR = 5.42–28.80), reinforcing the idea that prolonged hospitalization heightens the risk of infection [14].

In our study, extended hospital stays (>7 days) were linked to 4.72 times greater odds of postoperative infection, diabetes mellitus to 3.10 times greater odds, and oral cancer to 2.68 times greater odds. A meta-analysis in general surgical literature show that diabetic patients are at significantly greater odds of developing postoperative wound infections due to impaired immune response and delayed wound healing that may lead to longer hospital stay [15]. Furthermore, systematic reviews have found multiple risk factors within oral cancer populations—including diabetes, flap reconstruction, and extended operative times—that elevate SSI risk [16]. Although age >55 years and male gender were not statistically significant in our adjusted model, many studies have identified these as potential risk factors due to immunosenescence or behavioral differences related to wound care and health-seeking behavior [17]. Nevertheless, our data suggest that comorbid conditions such as diabetes and underlying pathology (e.g., malignancy) have more pronounced effects in the context of OMFS postoperative complications and longer hospital stay.

CONCLUSION

This study demonstrates that postoperative infection is significantly more common among long-stay (>7 days) oral and maxillofacial surgery patients compared with those who have shorter hospital stays. Prolonged hospitalization was identified as the strongest independent predictor of postoperative infection. In addition, diabetes mellitus and oral cancer were found to be significant risk factors, further increasing susceptibility to infection. These findings highlight the importance of early mobilization, strict infection-control practices, optimal glycemic control, and timely discharge planning in OMFS patients. Reducing unnecessary hospital stay and closely monitoring high-risk patients may substantially lower postoperative infection rates and improve surgical outcomes in resource-limited hospital settings like Bangladesh.

REFERENCES

1. *Tan FY, Selvaraju K, Audimulam H, Yong ZC, Adnan TH, Balasundram S. Length of hospital stay among oral and maxillofacial patients: A retrospective study. Journal of the Korean Association of Oral and Maxillofacial Surgeons. 2021 Feb 28;47(1):25-33.*
2. *Oppelaar MC, Zijtveld C, Kuipers S, Ten Oever J, Honings J, Weijs W, Wertheim HF. Evaluation of prolonged vs short courses of antibiotic prophylaxis following ear, nose, throat, and oral and maxillofacial surgery: a systematic review and meta-analysis. JAMA Otolaryngology–Head & Neck Surgery. 2019 Jul 1;145(7):610-6.*
3. *Uzumcugil F, Yilbas AA, Akca B, Ozkaragoz DB, Adiloğlu S, Tuz HH, Kanbak M. Overnight hospital stay and/or extended recovery period may allow long-duration oral and maxillofacial surgeries in the operating room of a dental hospital in an outpatient setting: a single-center experience. Journal of the Korean Association of Oral and Maxillofacial Surgeons. 2020 Apr 30;46(2):125.*
4. *Wang J, Ding M, Chang X, Zhang H, Liu Y, Qu S, Ma Q. Epidemiological characteristics and risk factors for prolonged hospitalisation in oral and maxillofacial space infections: a 3-year retrospective study of 217 cases. BMC Oral Health. 2025 Apr 17;25(1):582.*
5. *Lebo NL, Quimby AE, Caulley L, Thavorn K, Kekre N, Brode S, Johnson-Obaseki S. Surgical site infection affects length of stay after complex head and neck procedures. The Laryngoscope. 2020 Dec;130(12):E837-42.*
6. *Gillespie BM, Harbeck E, Rattray M, Liang R, Walker R, Latimer S, Thalib L, Andersson AE, Griffin B, Ware R, Chaboyer W. Worldwide incidence of surgical site infections in general surgical patients: a systematic review and meta-analysis of 488,594 patients. International Journal of Surgery. 2021 Nov 1;95:106136.*
7. *Mujagic E, Marti WR, Coslovsky M, Soysal SD, Mechera R, von Strauss M, Zeindler J, Saxer F, Mueller A, Fux CA, Kindler C. Associations of hospital length of stay with surgical site infections. World journal of surgery. 2018 Dec;42(12):3888-96.*
8. *Whitehouse JD, Friedman ND, Kirkland KB, Richardson WJ, Sexton DJ. The impact of surgical-site infections following orthopedic surgery at a community hospital and a university hospital adverse*

quality of life, excess length of stay, and extra cost. Infection Control & Hospital Epidemiology. 2002 Apr;23(4):183-9.

9. *Islam KR, Haque MM, Ara A, Forhad S. Comparison of Oral Opportunistic Pathogens between Short-Term and Long-Term Stay Patients in Hospital, Dhaka Bangladesh.*
10. *Zhang X, Li C, Wang R, Liu R, Lv H. Analysis and research on clinical factors and treatment of infection in oral and maxillofacial space infection. BMC Oral Health. 2025 Sep 29;25(1):1484.*
11. *Alansaari AB, Tawfik A, Jaber MA, Khamis AH, Elameen EM. Prevalence and socio-demographic correlates of dental anxiety among a group of adult patients attending dental outpatient Clinics: A Study from UAE. International Journal of Environmental Research and Public Health. 2023 Jun 13;20(12):6118.*
12. *Alzahrani S, Wazzan T, Almaghrabi A, Alkhudran A, Aljereb H, Elsayed S, Alolayan AB. The Prevalence and Diagnostic Patterns of Oral and Maxillofacial Lesions: A Seven-Year, Retrospective, Single-Center Cone Beam Computed Tomography and Histopathology Study in Saudi Arabia. Journal of Clinical Medicine. 2024 Dec 19;13(24):7774.*
13. *Amirah A, Harahap J, Willim HA, Suroyo RB, Henderson AH. Effect of comorbidities on the incidence of surgical site infection in patients undergoing emergency surgery: a systematic review and meta-analysis. Journal of Clinical Medicine Research. 2024 Aug 12;16(7-8):345.*
14. *Suenaga H, Schifter M, Chen N, Ali F, Byth K, Peck C. Impact of oral/dental disease burden on postoperative infective complications: a prospective cohort study. Clinical Oral Investigations. 2023 Nov;27(11):6461-70.*
15. *Mohamed AH, Mohamud HA, Arslan E. Epidemiological characteristics and predisposing factors for surgical site infections caused by bacterial pathogens exhibiting multidrug-resistant patterns. Antibiotics. 2021 May 24;10(6):622.*
16. *Chen M, Yang W, Mai X, Mao Z, Du Y, Jia S, Ding X, Xu X. Risk factors for surgical site infection in patients with oral cancer: a systematic review. Annals of surgical oncology. 2025 Oct 6:1-0.*
17. *Muhamad AN, Teh CS, Draman MR, Adnan YK, Abbas AA, Khong TL, Narayanan V, Tang SN, Karunakaran R, Manan NA, Kukreja A. High incidence of multidrug-resistant organisms and modifiable risk factors associated with surgical site infections: a cohort study in a tertiary medical center in Kuala Lumpur, Malaysia from 2020 to 2023. Antimicrobial Resistance & Infection Control. 2025 Mar 13;14(1):22.*