

## Original Research

### Assessment of risk factors of dry socket

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#### ABSTRACT:

**Aim:** The aim of this study is to evaluate the risk factors associated with the development of dry socket following tooth extractions. **Materials and methods:** Participants were aged between 18 and 60 years, with exclusions for those with coagulopathies, bleeding disorders, pregnancy, breastfeeding, or medications affecting wound healing. Baseline demographic data, including age, sex, and medical history, were recorded, alongside preoperative oral hygiene assessments and smoking status. Scaling was performed before surgery. The extraction procedure details, including technique and duration, were meticulously documented to explore associations with dry socket development. Data analysis was done using SSPS software. **Results:** The study included 50 participants, with an age distribution of 68% (n=34) between 18-40 years and 32% (n=16) between 41-60 years. In terms of gender, 46% (n=23) of the participants were male, while 54% (n=27) were female. Among the study participants, 25 out of 38 individuals with dry socket were smokers, compared to only 4 out of 12 in the non-dry socket group, with a statistically significant P value of <0.003. Additionally, poor oral hygiene was observed in 18 participants with dry socket, whereas only 1 participant without dry socket had poor oral hygiene, showing a significant association with a P value of 0.002. **Conclusion:** Smoking and poor oral hygiene were identified as key risk factors for dry sockets, highlighting the importance of preoperative counseling and preventive measures.

**Keywords:** smoking, dry socket, pain

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#### INTRODUCTION

Exodontia is the most common procedure in oral surgery and dentistry. Many patients experience moderate to severe pain not only due to the indications for extractions but also because of the fear associated with the procedure. In some cases, the anxiety surrounding extractions can heighten the perception of pain, whether real or imagined, depending on the clinician's skill.<sup>1,2</sup>

Pain management is a major concern, as some patients experience severe pain immediately after the extraction, which may persist for several days. This discomfort can be aggravated by underlying factors, individual pain thresholds, or complications that arise during or after the procedure.<sup>3</sup>

One of the major complications following tooth extraction is dry socket, also known as alveolar or fibrinolytic osteitis. Dry socket is a post-extraction complication characterized by the exposure of bone within or around the socket due to the absence of a stable blood clot or a persistent healing epithelium. This condition, occurring in 1% to 5% of extractions and up to 38% of mandibular third molar extractions, results in acute pain when the exposed bone is stimulated. Food particles and bacterial biofilm inside the socket can prevent clot reformation, prolong healing, and contribute to unpleasant symptoms such as halitosis and jaw pain. However, evidence suggests that bacteria are not the primary cause of dry socket.<sup>4,5,6</sup>

In our study we aimed to evaluate the risk factors associated with the development of dry socket following tooth extractions.

#### Materials and methods

Participants were aged between 18 and 60 years, with exclusions for those with coagulopathies, bleeding disorders, pregnancy, breastfeeding, or medications affecting wound healing. Baseline demographic data, including age, sex, and medical history, were recorded, alongside preoperative oral hygiene assessments and

smoking status. Scaling was performed before surgery. The extraction procedure details, including technique and duration, were meticulously documented to explore associations with dry socket development. Postoperative evaluations occurred at 48 hours, one week, and two weeks post-extraction, with prescribed medications. Dry socket cases were identified using predefined clinical criteria such as severe pain and delayed healing, ensuring consistency in diagnosis. Pain intensity was assessed using the Visual Analog Scale (VAS), allowing for a standardized measure of postoperative discomfort. Data analysis was done using SSPS software.

## Results

**Table 1: Participant Demographics**

Characteristics	Category	Frequency (n=50)	Percentage
Age(years)	18-40	34	68%
	41-60	16	32%
Gender	Male	23	46%
	Female	27	54%

The study included 50 participants, with an age distribution of 68% (n=34) between 18-40 years and 32% (n=16) between 41-60 years. In terms of gender, 46% (n=23) of the participants were male, while 54% (n=27) were female.

**Table 2: Risk factors associated with dry socket.**

Variable	Dry socket (n=38)	No dry socket (n=12)	P value
Smoking	25	4	<0.003
Poor oral hygiene	18	1	0.002

p-value was considered significant if  $\leq 0.05$ .

Among the study participants, 25 out of 38 individuals with dry socket were smokers, compared to only 4 out of 12 in the non-dry socket group, with a statistically significant P value of <0.003. Additionally, poor oral hygiene was observed in 18 participants with dry socket, whereas only 1 participant without dry socket had poor oral hygiene, showing a significant association with a P value of 0.002.

**Table 3: Visual Analog Scale.**

Time Point	Mean Pain Score (SD)
48 hours	5.2 (2.3)
1 week	4.5 (1.9)
2 weeks	3.1 (0.8)

The mean pain score, assessed using the Visual Analog Scale, was 5.2 (SD  $\pm 2.3$ ) at 48 hours post-extraction. By the end of the first week, the pain score decreased to 4.5 (SD  $\pm 1.9$ ), indicating gradual relief. At the two-week mark, the mean pain score further reduced to 3.1 (SD  $\pm 0.8$ ).

## Discussion

Dry socket, or alveolar osteitis, is a common post-extraction complication characterized by severe pain due to the loss or disintegration of the blood clot within the socket. Several risk factors have been identified that contribute to its development, including smoking, poor oral hygiene, traumatic or prolonged extractions, systemic conditions like diabetes, and the use of oral contraceptives. Other factors such as bacterial contamination, pre-existing periodontal disease, and failure to follow post-extraction care instructions can also increase the likelihood of dry socket.<sup>7</sup> Understanding these risk factors is essential for developing preventive strategies and improving patient outcomes following dental extractions.

In our study the study included 50 participants, with an age distribution of 68% (n=34) between 18-40 years and 32% (n=16) between 41-60 years. In terms of gender, 46% (n=23) of the participants were male, while 54% (n=27) were female.

Among the study participants, 25 out of 38 individuals with dry socket were smokers, compared to only 4 out of 12 in the non-dry socket group, with a statistically significant P value of <0.003. Additionally, poor oral hygiene was observed in 18 participants with dry socket, whereas only 1 participant without dry socket had poor oral hygiene, showing a significant association with a P value of 0.002.

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Tandon P et al.<sup>8</sup> investigated the prevalence of dry sockets and associated risk factors over a 12-month period. A total of 238 participants aged 18-40 years underwent third molar extractions, with exclusions for conditions affecting healing. Data collection included baseline assessments, intraoperative details, and postoperative evaluations at 48 hours, one week, and two weeks. The prevalence of dry sockets increased from 20.6% at 48 hours to 41.2% at two weeks. Statistical analysis identified smoking (OR: 6.41,  $p < 0.001$ ), poor oral hygiene

(OR: 9.53,  $p = 0.003$ ), and surgical technique (OR: 3.27,  $p < 0.001$ ) as significant risk factors. Pain intensity, measured using a Visual Analog Scale, decreased over time. These findings highlighted the impact of modifiable risk factors, underscoring the importance of preoperative counseling and preventive strategies.

Kuśnierek W et al.<sup>9</sup> conducted a systematic review to examine the relationship between smoking and dry socket. Following PRISMA guidelines, eleven studies met the inclusion criteria. A meta-analysis revealed that tobacco smokers had more than three times the odds of developing dry socket compared to non-smokers. The combined incidence of dry socket was approximately 13.2% in smokers and 3.8% in non-smokers. Despite variations in the included studies, such as differences in tooth types and age groups, cigarette smoking was consistently associated with an increased risk of dry socket after tooth extraction.

Rakhshan V<sup>10</sup> conducted a narrative review to summarize common risk factors for dry socket. While factors such as surgical difficulty, surgeon's experience, oral contraceptive use, and oral hygiene showed strong evidence of association, the effects of age, gender, and smoking remained inconclusive. The potential influence of female sex and oral contraceptive use was attributed to varying estrogen levels, which could differ significantly between individuals. The review suggested that many risk factors were likely a combination of multiple independent variables, emphasizing the need for more comprehensive study designs to better understand their interactions.

A limitation of our study was the small sample size, which may have affected the generalizability of the findings. A larger sample size is needed to enhance the reliability and statistical power of future research.

## Conclusion

Smoking and poor oral hygiene were identified as key risk factors for dry sockets, highlighting the importance of preoperative counseling and preventive measures.

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