

# The link between gender and post-extraction complications of teeth

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#### Abstract:

Extraction of teeth is a common procedure in dentistry. Recalling patients for monitoring wound healing is a concern in surgical procedures. It allows foreseeing signs or/and symptoms possibly related to surgical complications. Therefore, it is of interest to document the link between gender and complications in post extraction. The null hypothesis was age and gender had no impact on post dental extraction. We used patient records at Saveetha Dental College, India for this study. The overall follow-up rate post-extraction is less compared to known literature. Data shows that males outnumbered the females and those "above 40 years" than "below 40 years" in follow-up. Thus, we report that factors such as gender, age and the presence of a post-operative complication play a key role in determining whether a patient reports back for follow-up after routine extractions.

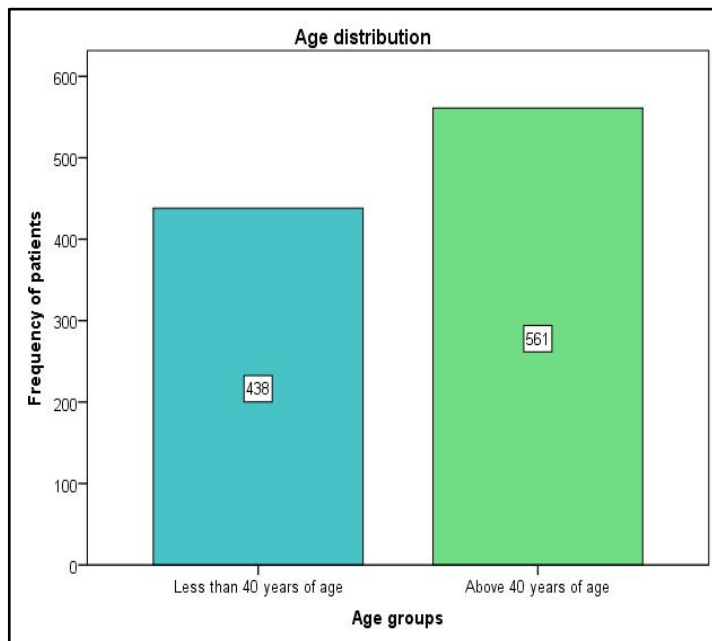
**Keywords:** exodontia; follow-up; forceps extraction; gender; post-extraction complications.

#### Background:

Exodontia is defined as the painless removal of the whole tooth or root with minimum trauma to the investing tissues so that the wound heals uneventfully and no post-operative prosthetic problem is created [1]. Extraction of teeth is commonly indicated as the treatment option for dental caries and its sequelae (e.g. pulpitis and periapical infections), periodontal diseases, tooth fracture, malposed or impacted teeth, orthodontic treatment, retained deciduous teeth, prosthetic considerations, supernumerary teeth and in preparation for radiotherapy [2]. Knowledge about post-

operative complications is imperative for dentists in order to educate the patients pre-operatively [3]. Extraction can lead to many complications such as hemorrhage, persistent pain and swelling, infection, dry socket, dentoalveolar fractures, paresthesia of nerves, temporomandibular joint injury, oro-antral communication and even fractures of the jaw bones which may be greatly influenced by different factors such as age and health condition of the patient, gender, surgeon's clinical experience, smoking, intake of contraceptives, quality of oral hygiene, and surgical technique. Recalling patients for monitoring wound

healing is a chief concern in all-surgical procedures as it allows foreseeing signs or/and symptoms possibly related to surgical complications [4]. Therefore, it is of interest to document the link between gender and complications in post extraction.



**Figure 1:** Image representing the age distribution of the study population. Bar graph shows the age distribution of the population that reported back for follow-up. X-axis shows the age group of patients (Blue- less than 40 years, green- more than 40 years) and Y-axis shows the frequency of patients reporting back. 56.2% of the patients were found to belong to the age group 'above 40 years' while 43.8% belonged to the 'less than 40 years' age group.

#### Methodology:

The current study was a retrospective cross-sectional cohort study that was performed in a university setting. The records of patients who underwent simple extraction of teeth from June 2019 to March 2020 were analysed. Institutional ethical committee clearance was obtained for data retrieval and usage as needed for the study (SDC/SIHEC/2020/DIASDATA/0619-0320). 7566 patients underwent extraction as outpatients during the study time period. 999 patients (555 males, 443 females, 1 transgender) out of the 7566 patients who reported back for review were considered in this study by means of non-probability convenience sampling. This study included patients belonging to the same geographical

location and ethnicity. All the data available was included to minimize any sampling bias.

#### Statistical analysis:

Data was recorded in Microsoft Excel/2016 (Microsoft office 10) and later exported to the Statistical Package for Social Science for Windows (version 20.0, SPSS Inc., Chicago Ill., USA) and subjected to statistical analysis. Chi square test was employed with a level of significance set at  $p < 0.05$ .

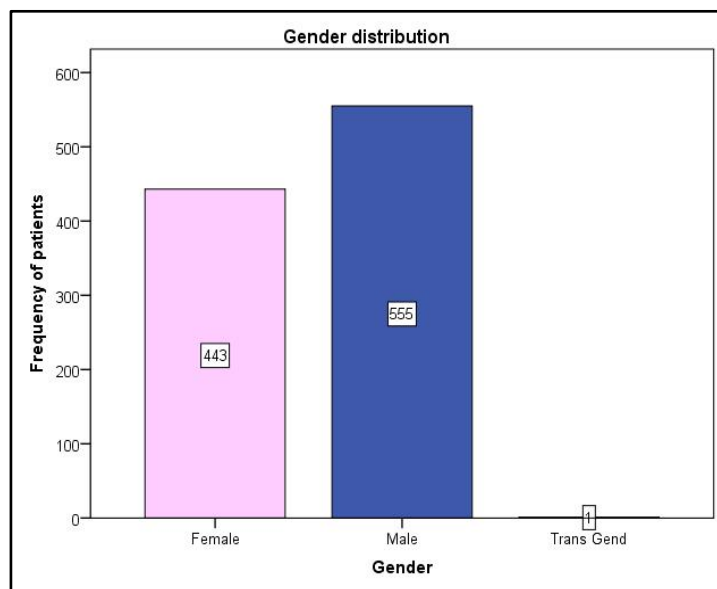
#### Results:

The final dataset consisted of 999 patients of Indian origin who reported back for review post-extraction. The mean age of the study population (N=999) ranging from ages 18 to 86 years was found to be  $44.32 \pm 15.322$  years. Most of the patients who reported back belong to the age group 'above 40 years' (56.2%) than those of 'less than 40 years' age group (43.8%) (Figure 1). Most of the patients who reported back were males (55.6%), followed by females (44.3%) and transgender (0.1%) (Figure 2). Out of 7566 patients who underwent extraction, only 13.2% (N=999) patients reported back for follow-up post-extraction. Males showed a greater tendency to report back for routine follow-up (56.1%). Out of the 999 patients who reported back, 70.4% reported back for routine follow-up as per advice of the dentist, 24.2% reported back for suture removal and 5.4% reported back due to other reasons (Figure 3). The other reasons for which the patients reported back included ameloblastic fibroma, bony spicules, dry socket, flap surgery, oro antral communication, pain, parotid swelling, periodontal abscess, replacement of teeth, sinus opening, trauma and trismus. The most common complication associated was found to be dry socket (2.9%). More males reported back for routine review, followed by females for routine review, followed by males for suture removal. However, there was no statistically significant difference between reason for review and gender ( $p > 0.05$ ) (Figure 4). There was a statistically significant difference between reason for review and age ( $p = 0.000$ ). It was found that most commonly patients above 40 years reported back for routine review, followed by those less than 40 years for routine review. The next most common reason was for suture removal by those less than 40 years, followed by those above 40 years (Figure 5).

#### Discussion:

In the current study, only 13.2% of patients reported back for follow-up post-extraction. This is relatively low when compared to the follow-up rates in other countries. A study by Faheem *S et al.* [4] revealed a post-op follow-up rate of 66% in Karachi. Another study

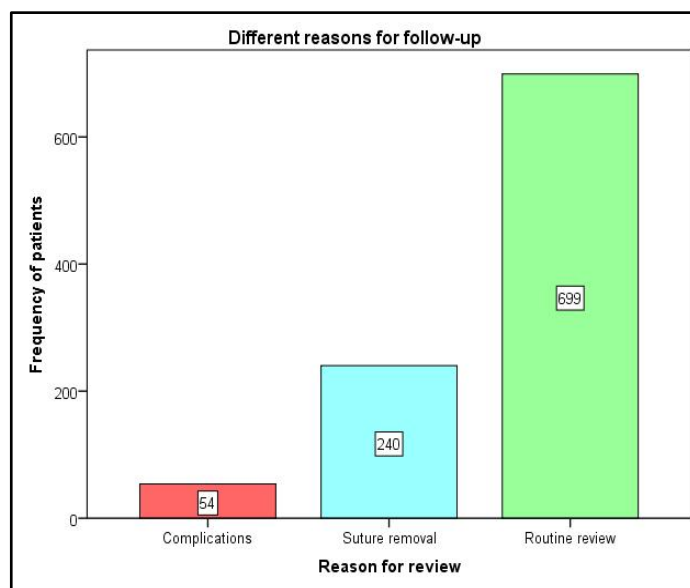
by E. T. Adebayo *et al.* [5] showed that 54% of the patients reported back for follow-up as per the advice of the dentist. The probable reason for this disparity could be the literacy rate differences between different geographical locations. There was no statistically significant difference between follow-up and gender in the current study. However, a male preponderance for follow-up was seen in this study, which is contradictory to other studies [6]. It could be attributed to the fact that the need for extraction as well as eventual healing is aggravated by smoking and other adverse habits common to the male population in India.



**Figure 2:** Image representing the gender distribution of the study population. Bar graph shows the gender distribution of the population that reported back for follow-up. X-axis shows the gender (pink - females, blue - males and green - transgenders) and Y-axis shows the frequency of patients reporting back. 55.6% of the population were males, 44.3% females and 0.1% transgender.

Patients should be made aware of the post-operative complications and be advised to report back for a routine check-up to aid in optimal recovery. This study showed that the most common complication post-extraction was dry socket. The studies carried out by Jaafar N *et al.* [7], Simon E *et al.* [8] and Bui C H *et al.* [9] also revealed dry socket to be the most common complication post-exodontia. Literature reveals a greater predilection for females to report back for follow-up with complications, possibly because of the effect of hormones and contraceptives in wound healing.

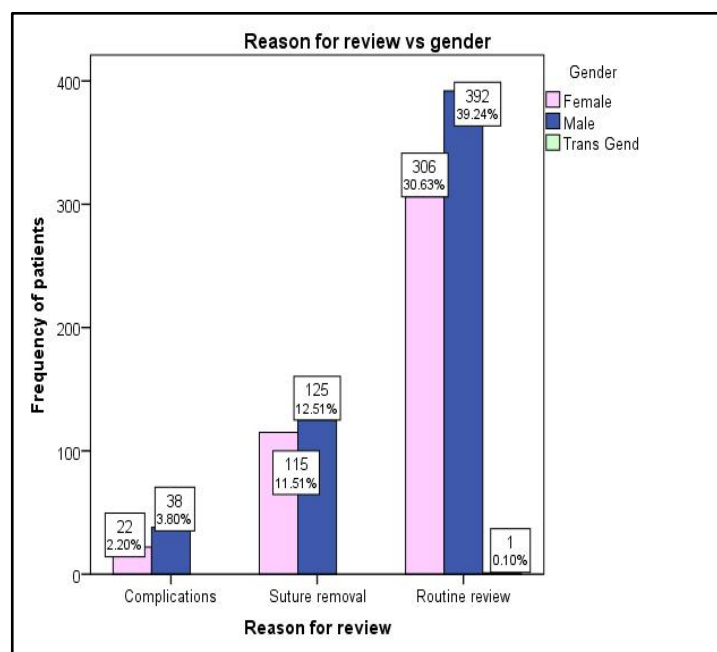
Evidence also suggests a greater prevalence of dry socket in females [10,11]. The high incidence of these post-operative complications along with low follow-up rates necessitates the requirement for more atraumatic extraction techniques [12]. The next most common reason for review in this study was for prosthodontic replacement. Studies have shown that patients were mostly aware of the functional and aesthetic problems associated with non-replacement of extracted teeth [13].



**Figure 3:** Image representing the different reasons for reporting back. Bar graph shows the reasons for which patients reported back for follow-up. X-axis shows the different reasons (red-complications, blue- suture removal and green- routine review) and Y-axis shows the frequency of patients reporting back. 70.4% reported back for routine follow-up, 24.2% reported back for suture removal and 5.4% reported back due to other reasons.

A minority of patients in the current study reported back with pain or presence of a bony spicule. The low incidence for this is probably because post-operatively analgesics and antibiotics are always prescribed routinely. Alleviation of pain by analgesic prescription practices [14] could also account for one of the reasons why patients don't report back for follow-up. Bony spicules will be prevented by alveoloplasty on the same day of extraction [15]. There was a statistically significant difference between follow-up and age groups in this study ( $p=0.000$ ). There were more patients greater than 40 years of age who reported back for review. This may be

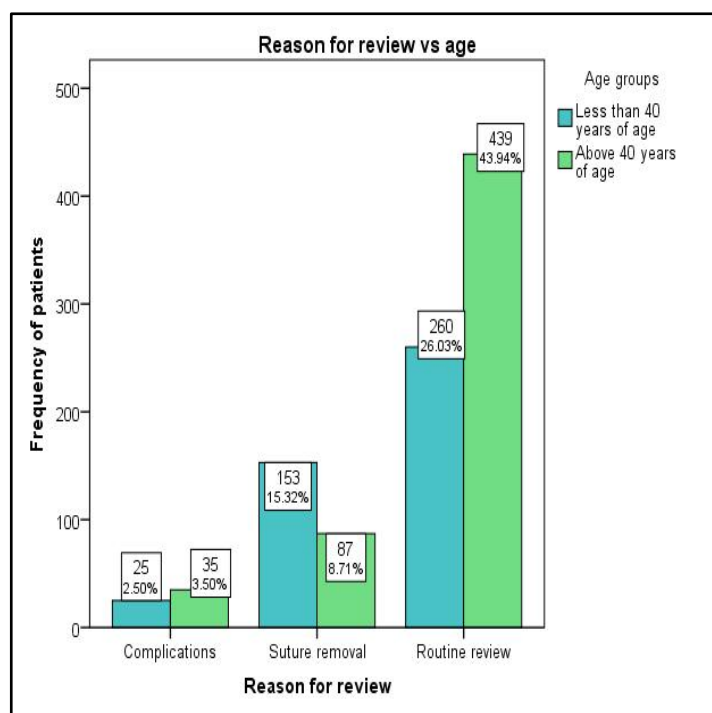
attributed to the fact that there is a greater incidence of conditions such as periodontitis and diabetes mellitus that are associated with tooth loss in the age group of 40 years and above as reported in literature [16]. Another study carried out in the UK showed higher patient compliance in individuals belonging to 60 years and above as well [17]. In developing nations like India, fee for service is still the main form of payment modality. Very few individuals can afford to utilize this service often.



**Figure 4:** Image representing the association between reason for review and gender. Bar chart shows the association between reasons for review and gender. X-axis shows the different reasons for review (pink- females, blue- males and green- transgenders) and Y-axis shows the frequency of patients reporting back. Males showed greater tendency to report back for routine-follow up (39.24%). 12.51 % males reported back for suture removal. 3.8 % males reported back because of post extraction complications. However, there was no statistically significant correlation found by Pearson's Chi-Square test. (Pearson's Chi-Square value = 3.177, df=4, p-value=0.481 (p>0.05))

Preventive measures are not given much weightage owing to expense and therefore the percentage of the population availing dental services and reporting for follow ups has remained low for a long while [18]. Another review by Jin J *et al.* [19] suggests that the

educational level of a patient may be a good predictor of therapeutic compliance. Most uneducated patients believe in the myths and misconceptions about dental treatment and are skeptical regarding it. Compulsory education would not only equip the individuals with knowledge and information but will also sensitize them to dental therapy and the importance of routine dental visits at a very tender age by means of the various dental health camps organized in educational institutions [20]. Further research with a larger sample size is needed to establish the findings of this novel study, explore the reasons behind their non-compliance and devise strategies to spread awareness among patients on the need for follow-up, education as well as dental insurance policies.



**Figure 5:** Image representing the association between reason for review and age. Bar chart shows the association between the reason for reporting back for review and age. X-axis shows the different reasons for review (blue- patients less than 40 years of age, green- patients more than 40 years of age) and Y-axis shows the frequency of patients reporting back. Most patients above 40 years reported back for routine review, followed by those less than 40 years for routine review. The next most common reason was for suture removal by those less than 40 years, followed by those above 40

years. This association was found to be statistically significant by Pearson's Chi-Square test. (Pearson's Chi-Square value=51.288, df=2, p=0.000 (p<0.05))

### Conclusion:

The overall follow-up rate post-extraction is less compared to known literature. Data shows that males outnumbered the females and those "above 40 years" than "below 40 years" in follow-up. Thus, we report that factors such as gender, age and the presence of a post-operative complication play a key role in determining whether a patient reports back for follow-up after routine extractions.

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