# **Prevalence and Distribution of Dental Caries in Patients Undergoing Extraction of Permanent Teeth: An Institutional Study**

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#### Abstract

An increase in the prevalence of dental caries has been observed, which can be attributed to a change in lifestyle that involves increased consumption of sugary food, carbonated drinks, and lack of awareness towards proper oral health maintenance. Dental caries is one of the most prevalent chronic oral diseases which lead to tooth loss, affecting all age groups causing a major public health concern. It is important to acknowledge the causes of dental caries prevent it from deteriorating and hence reduce the number of extractions in future. The aim of the study was to investigate the prevalence and distribution of dental caries in patients undergoing extraction of permanent teeth at Saveetha Dental College and Hospitals. In this retrospective cross-sectional study, digital case records of all patients who underwent extractions of permanent teeth due to dental caries in Saveetha Dental College and Hospital from June 2019 to March 2020 were reviewed. Demographic details of patients and the extracted tooth numbers were recorded from digital case records. Retrieved data was analyzed using IBM SPSS Software Version 20.0. Descriptive statistics and tests of association for categorical variables by Chi square tests were done and results were obtained. P value<0.05 was considered statistically significant. 6808 patients underwent 16,955 extractions of permanent teeth due to dental caries in Saveetha Dental College, out of which the prevalence of extraction due to dental caries was more in the third molars, in the age group of 41-50 years with a male predilection. On comparing the association of extractions (tooth number) with age and gender of the patients, the results were statistically significant. (Pearson's Chi Square test, p<0.05). Within the limits of the present study, it can be concluded that the prevalence of extraction due to dental caries was more in the third molars, in the age group of 41-50 years with a male predilection.

#### Keywords:

Dental caries; Tooth loss; Extraction; Prevalence; Molars; premolars; Anterior teeth

#### Introduction

Dental caries is a disease that has an increased prevalence and severity in worldwide adult populations.

Dental caries has been shown to affect over half of the population in most of the industrialized countries as it is a cumulative process.

The number of affected individuals due to dental caries increases with age. <sup>[1-4]</sup> Certain studies have shown that dental caries in adult populations affect at least five to ten teeth per individual, making it the most significant reason for tooth loss in adult patients. <sup>[5-8]</sup>

Dental caries is an irreversible infection and the damage caused by it can lead to a decreased quality of life in affected individuals along with high economic costs for the individuals and the society, which makes this disease into an important public health problem. [5-8] The World Health Organization (WHO) states that there is an increase in the chronic diseases associated with poor oral health, in the developing countries, in which higher levels of caries,

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edentulousness, and periodontal diseases have been mentioned.
<sup>[3]</sup>

It has been shown in studies concerning epidemiology in dentistry that dental caries and periodontal diseases are said to be the most prevalent pathologies that affect the oral cavity. Studies performed by American researchers had previously suggested that dental caries was one of the main reasons for extraction of teeth, and other studies conducted in Brazil, Sweden and even in New Zealand have confirmed that dental caries may lead to tooth mortality. <sup>[9-13]</sup>

Many studies have been conducted in different countries to determine the causes behind extraction of teeth. Although their results seem to be controversial, most studies have shown that dental caries and its sequelae have been the main cause for extraction of teeth. <sup>[14-17]</sup>

Tooth loss is ranked among one of the hundred health conditions that severely affect the world's population. <sup>[18]</sup> It is an oral condition that leads to aesthetic, functional and social damage negatively impacting people's quality of life. <sup>[19,20]</sup> Studies have shown that dental caries is one of the most common chronic diseases. In the United States, it has been estimated that dental caries are five times as common as asthma and seven times as common as allergic rhinitis. <sup>[21]</sup> The recent Global Burden of Disease (GBD) study has found that dental caries of the permanent dentition was said to be the most prevalent condition worldwide, that affects 35% of the world population. <sup>[22]</sup>

A large number of cross-sectional studies have been conducted to determine the cause for tooth loss in different countries. Dental caries was found to be the main cause for tooth loss England and Wales, Kuwait, Taiwan, Scotland, Hong Kong, Afghanistan, Brazil but in contrast a few studies that showed a higher proportion of tooth extractions were due to periodontal disease. <sup>[15,23-30]</sup>

In children with primary dentition, dental caries is often left untreated most of the time. This causes infection, discomfort and severe pain, leading to disrupted eating and sleeping patterns that can negatively affect the children's ability to concentrate in school, compromising their overall educational performance. <sup>[31]</sup> Moreover, severe dental caries have negatively impacted the growth and development of a child. <sup>[32,31]</sup> Amongst adults and older people, tooth loss caused due to dental caries has shown to severely restrict dietary intakes such as fresh fruits and vegetables. <sup>[33]</sup>

From the clinical aspect, dental caries are caused due to poor oral hygiene, consumption of foods high in added sugars, lack of fluoride, tobacco use and excess alcohol consumption. Some studies have consistently shown that carries in the primary dentition is a precursor of caries in the permanent dentition. <sup>[34]</sup> The prevalence and severity of dental caries in the primary dentition has been shown to be strongly related to socio-economic factors such as family income and maternal education. <sup>[35]</sup> Some studies report about the gender differences in their findings and those that do, often show disparities. Some studies have stated a higher prevalence of tooth loss in women, whereas some studies showed a higher prevalence in men, while still others showed no significant relationship with gender. <sup>[36-43]</sup> The variations could be because better dental behavior is seen among females due to better perception on esthetics and also women have a greater sensitivity towards illness and discomfort. <sup>[44]</sup> In contrast women experience variations in the in oestrogen and progesterone levels throughout their life cycle. This is considered to make them more susceptible to periodontal disease than men. <sup>[45]</sup> Men on the other hand consume alcohol more often and smoke more cigarettes which make them more susceptible to tooth loss. <sup>[46]</sup>

Extraction is one of the dental treatments which are considered as the last option. A decrease in the number of teeth may result in poor dietary habits and lead to decreased quality of life. <sup>[47]</sup> The number of teeth extracted can serve as an indicator of socio-economic and oral hygiene level. <sup>[48]</sup> Dental caries, periodontal disease, orthodontic reasons, impacted teeth, failed dental treatment; prosthetic indications have been one of the several reasons for the extraction of permanent teeth. It is important to understand the reasons for extraction of teeth as it is essential to improve oral health outcomes.

Previously our team had conducted numerous clinical studies case reports and reviews over the past 5 years. <sup>[49-63]</sup> Now we are focusing on retrospective studies. Previously our team has a rich experience in working on various research projects across multiple disciplines. <sup>[64-78]</sup> Now the growing trend in this area motivated us to pursue this project.

Prevention of caries among all age groups is required, along with determining the sequelae of dental caries, as it will identify those patients at risk and will indicate when and where intervention is most required. This study aims to evaluate the prevalence and distribution of dental caries in patients undergoing extraction of permanent teeth in our institution.

## **Materials and Methods**

#### Study design and study setting

This retrospective descriptive study was conducted in Saveetha Dental College and Hospital, Saveetha University, Chennai, to evaluate the age, gender and tooth distribution in patients undergoing extractions of permanent teeth due to dental caries from June 2019 to March 2020. The study was initiated after approval from the institutional review board-SDC/SIHEC/ 2020/DIASDATA/0619-0320

## Study population and sampling

Inclusion criteria for the study were dental patients between the age group of 11-90 years who underwent extraction for dental caries in our institution. The exclusion criterion was missing or incomplete data. After assessing 86000 case sheets in the university patient data registry, consecutive case records of 6808 patients who underwent extractions of permanent teeth due to dental caries were included in the study. Cross

verification of data for errors was done with the help of an external examiner.

#### Data collection and tabulation

A single calibrated examiner evaluated the digital case records of 6808 patients who underwent extractions of permanent teeth due to dental caries from June 2019 to March 2020. Demographic details like age, gender and the tooth which was extracted were also recorded. Extracted tooth numbers were recorded in each quadrant. The Federation Dentaire Internationale (FDI) teeth numbering system (ISO-3950) was used for labeling the upper right eight teeth as 11–18, upper left eight teeth as 21–28, lower left eight teeth as 31–38, and lower right eight teeth as 41–48.

#### **Statistical analysis**

The collected data was validated, tabulated and analysed with Statistical Package for Social Sciences for windows, version 20.0 (SPSS Inc., Chicago, IL, USA) and results were obtained. Descriptive statistics was done. Categorical variables were expressed in frequency and percentage; and continuous variables in mean and standard deviation. Chi-square test was used to test associations between categorical variables. P value<0.05 was considered statistically significant.

## **Results and Discussion**

In our study 6808 patients underwent 16,955 extractions of permanent teeth due to dental caries. The following results were obtained in our study. When we evaluated the percentage of teeth extracted in each quadrant, in the first Quadrant, the percentage of extractions was higher in 18(24.5%), followed by 17(15.7%), 16(16.5%), 14(11.6%), 15(10.8%), 13(7.5%), 12(7.0%) and 11(6.4%) [Figure 1]. In the second Quadrant, the percentage of extractions was higher in 28 (25.1%), followed by 26(17.0%), 27(16.0%), 25(10.3%), 24(10.0%), 23(7.8%), 22(7.3%) and 21(6.5%) [Figure 2]. In the third Quadrant, the percentage of extractions was higher in 38(25.8%), followed by 36(19.6%), 37(15.6%), 35(8.4%), 31(8.3%), 32(8.2%), 34(7.5%) and 33(6.6%) [Figure 3]. In the fourth Quadrant, the percentage of extractions was higher in 48(24.3%), followed by 46(20.8%), 47(16.1%), 45(9.0%), 42(8.3%), 41(8.0%), 44(7.2%) and 43(6.3%) [Figure 4].

The association between gender and extractions due to dental caries of each quadrant (tooth wise) was evaluated. In first Quadrant males had a higher prevalence of extractions than females in most numbers of teeth. 18 was the most commonly extracted tooth due to dental caries in both genders and it is statistically significant. Pearson's Chi square test, p<0.000 (<0.05) [Table 1, Figure 5]. In the second Quadrant, males had a higher prevalence of extractions than females in most numbers of teeth. 28 was the most commonly extracted tooth due to dental caries in both genders and it is statistically significant. Pearson's Chi square test, p<0.000 (<0.05) [Table 1, Figure 5]. In the second Quadrant, males had a higher prevalence of extractions than females in most numbers of teeth. 28 was the most commonly extracted tooth due to dental caries in both genders and it is statistically significant. Pearson's Chi square test, p<0.013 (<0.05) [Table 2, Figure 6]. In the third Quadrant Males had a higher prevalence of extractions than females in most numbers of teeth. 38 was the most commonly extracted tooth due to dental

caries in both genders and it is statistically significant. Pearson's Chi square test, p<0.001 (<0.05) [Table 3, Figure 7]. In the fourth quadrant males had a higher prevalence of extractions than females in most numbers of teeth. 48 was the most commonly extracted tooth due to dental caries in both genders and it is statistically significant. Pearson's Chi square test, p<0.029 (<0.05) [Table 4, Figure 8].

The association between age and extractions due to dental caries of each quadrant (tooth wise) was evaluated. In the first quadrant, the age group 41-50 (24.6%) has a higher prevalence of extractions than other groups. The prevalence was least in the age group 81-90 (0.8%). 18 is the most commonly extracted tooth due to dental caries in most of the age groups and it is statistically significant. Pearson's Chi square test, p<0.000 (<0.05) [Table 5, Figure 9]. In the second quadrant, the age group 41-50 (25.7%) has a higher prevalence of extractions than other groups. The prevalence was least in the age group 81-90 (0.8%). 28 is the most commonly extracted tooth due to dental caries in most of the age groups and it is statistically significant. Pearson's Chi square test, p<0.000 (<0.05) [Table 6, Figure 10]. In the third quadrant, the age group 41-50 (22.5%) has a higher prevalence of extractions than other groups. The prevalence was least in the age group 81-90 (0.7%). 38 is the most commonly extracted tooth due to dental caries in most of the age groups and it is statistically significant. Pearson's Chi square test, p<0.000 (<0.05) [Table 7, Figure 11]. In the fourth quadrant, the age group 41-50 (21.8%) has a higher prevalence of extractions than other groups. The prevalence was least in the age group 81-90 (0.8%). 48 is the most commonly extracted tooth due to dental caries in most of the age groups and it is statistically significant. Pearson's Chi square test, p<0.000 (<0.05) [Table 8, Figure 12].

A study in Japan conducted by Aida et al. <sup>[47]</sup> stated that 43.4% extractions were due to caries and 32.7% due to fracture of caries. Jafarian et al. <sup>[79]</sup> has also stated that tooth loss due to caries was 51%. Anyanechi et al. reported that the commonest reasons for teeth extraction were caries. <sup>[80]</sup> Trovik et al. <sup>[81]</sup> reported that 40.2% of the teeth extracted were due to caries and its sequelae. Similar to this finding, 43.2% of the teeth extraction due to caries was commonly observed in all age groups over 15 years. Montandon et al. <sup>[82]</sup> has also mentioned that caries (62.7%) was the most prevalent reason for tooth mortality among young and adults up to 44 years old. Al-Assadi <sup>[17]</sup> reported 1709 teeth were extracted from 1055 patients in which Majority of extractions.

Supporting our study results, Wahab <sup>[83]</sup> showed that of all teeth extracted due to caries, molars were the most frequently extracted (56.9%). Aida et al. <sup>[47]</sup> states they had an increased prevalence of extraction in maxillary and mandibular molars, 919 and 946 respectively. A study by Aleisa et al. <sup>[84]</sup> reports that the most commonly extracted tooth type in all age groups was the molars (60%), with the most frequently extracted posterior tooth was the mandibular third molar (19.4%) and the least being maxillary lateral incisor (0.7%), supporting our

results. Almarsi [85] states that molars were found to be the most commonly extracted teeth constituting 55.6% of the sample. Amongst all molars, the mandibular ones were the most extracted (66.5%); in particular, the mandibular first right molars were followed by the mandibular left first molars, which is similar to our study findings. Tzimpoulas et al. [86] reported in a study with 275 extracted teeth, maxillary molar presented 36.2%, while mandibular molars 32.9%. Anyanechi et al. <sup>[80]</sup> states that 44.2% teeth were extracted from the lower jaw in 1st mandibular molar. The molars and premolars were extracted more frequently than the anterior teeth. This is explained by the presence of pits and fissures in these sets of teeth, which cause more retention of plaque in them. Our institution is passionate about high quality evidence based research and has excelled in various fields. [87-93] We hope this study adds to this rich legacy.

Evaluating the age wise distribution of extraction, Jafarian et al. <sup>[79]</sup> states that the highest rate (36.9%) of extraction occurred for those 41-60 years old, supporting our study results. Montandon et al. [82] also reports that groups with range from 35 to 44 years, 45 to 54 years, and 55 to 64 years revealed a significantly greater number of teeth extractions than other age groups and the results were statistically significant. Hamagharib et al. [94] also supports our study findings by stating that the most number of dental extraction was done at the age group of 41-50 yrs (23.5%). According to Bikash et al. <sup>[95]</sup> in Kantipur dental college, dental extraction was done more in the age group of 41-50 years (19%) which is in accordance to our study results. Meanwhile, Kumar et al. [96] stated that 35-44 was the age group with the most number of extractions, contradicting our study. Moreover, Tassoker et al. <sup>[97]</sup> reported that 31-40 years was the most prevalent age group. Farah Naz<sup>[98]</sup> showed that subjects of the age less than 30 year had an increased prevalence of dental extraction, thus disagreeing with our study results.

Evaluating the gender wise distribution of extraction, Hassan <sup>[99]</sup> reported an increased prevalence in males (68.0%) than females (32.0%) supporting our study results. According to Tassoker et al. [97] out of 193 extraction patients, with extraction due to dental caries, 53.4% were males and 46.6% were females, similar to our study results. Moreover, Byahatti et al. <sup>[100]</sup> in Libyan population and Rashdan <sup>[101]</sup> in Jordanian population reported male predilection. Previous studies <sup>[102,17]</sup> have also shown male prevalence. Meanwhile, studies by Jafarian et al. <sup>[79]</sup> and Aida et al. <sup>[47]</sup> showed no significant difference between males and females. In contrast to our study results, Anyanechi et al. [80] reports a male-to-female ratio of 1:1.7 extraction due to dental caries. Farah Naz,<sup>[98]</sup> in Pakistan also states an increased prevalence in females (56%). According to Kumar et al. [96] Hamagharib et al. [94] Bikash et al. <sup>[95]</sup> a female predominance was shown, thus disagreeing with our study results. This may be attributed to the universal belief that females usually attend dental clinics more than males and are therefore more conscious of their health-related problems.

Our study has its own limitations as the data is restricted to university patients, hence cannot be generalized. Further studies should be conducted on multicentre study with large sample size considering the oral habits, dietary habits, socio economic status of patients for better outcomes.



**Figure 1:** Bar chart depicting the distribution of tooth extracted due to dental caries in the first Quadrant. X-axis represents the tooth number in the first quadrant and Y-axis represents the number of patients undergoing extractions due to dental caries. Percentage of extractions was higher in 18 (24.5%), followed by 17 (15.7%). The prevalence of extraction in quadrant 1 was more in molars, followed by premolars and anteriors.



**Figure 2:** Bar chart depicting the distribution of tooth extracted due to dental caries in the second Quadrant. X-axis represents the tooth number in the second quadrant and Y-axis represents the number of patients undergoing extractions due to dental caries. Percentage of extractions was higher in 28 (25.1%), followed by 26 (17.0%). The prevalence of extraction in quadrant 2 was more in molars, followed by premolars and anteriors.

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**Figure 3:** Bar chart depicting the distribution of tooth extracted due to dental caries in the third Quadrant. X-axis represents the tooth number in the third quadrant and Y-axis represents the number of patients undergoing extractions due to dental caries. Percentage of extractions was higher in 38 (25.8%), followed by 36 (19.6%). The prevalence of extraction in quadrant 3 was more in molars, followed by anteriors and premolars.



**Figure 4:** Bar chart depicting the distribution of tooth extracted due to dental caries in the fourth Quadrant. X-axis represents the tooth number in the fourth quadrant and Y-axis represents the number of patients undergoing extractions due to dental caries. Percentage of extractions was higher in 48 (24.3%), followed by 46 (20.8%). The prevalence of extraction in quadrant 4 was more in molars, followed by anteriors and premolars.

 Table 1: Table depicting association between gender and extractions due to dental caries in the first quadrant. (Pearson's Chi square test=31.847a, p=0.000 (<0.05), hence statistically significant. Males (51.7%) have a higher prevalence of extractions than females (48.3%). 18 (24.5%) is the most commonly extracted tooth due to dental caries in both genders and it was found to be statistically significant.</th>

			Tooth number (Quadrant 1)									
		11	12	13	14	15	16	17	18			
Gender	Male	167	180	167	273	232	393	384	500			
	Female	119	130	168	241	247	338	315	589			
То	Total		310	335	514	479	731	699	1089			
					Chi Square tes	t						
								Value	df	Asymp. Sig.		
										(2-sided)		
								31.847a	7	0.000		



Figure 5: Bar chart depicting association between gender and extractions due to dental caries in the first quadrant. X-axis represents the gender and Y-axis represents the number of patients undergoing extractions of teeth due to dental caries in the first quadrant. Association between gender and extractions due to dental caries in quadrant 1 was done using Chi-square test and was significant. Pearson's Chi square test, p<0.000 (<0.05). Males had a higher prevalence of extractions than females in most tooth numbers. 18 was the most commonly extracted tooth due to dental caries in both genders and it is statistically significant.

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Table 2: Table shows association between gender and extractions due to dental caries in the second quadrant. (Pearson's Chi square test=17.771a, p=0.013 (<0.05), hence statistically significant. Males (53.1%) have a higher prevalence of extractions than females (46.9%). 28 (25.1%) is the most commonly extracted tooth due to dental caries in both genders and it was found to be statistically significant.												
	Tooth number (Quadrant 2)											
21 22 23 24 25 26 27 28												
Gender	Male	170	192	181	234	231	417	389	550	2085		
	Female	119	135	165	210	228	338	325	565	4449		
т	otal	289	327	346	444	459	755	714	1115			
					Chi Square test	:						
									df	Asymp. Sig.		
										(2-sided)		
		17.771a	7	0.013								



Figure 6: Bar chart depicting association between gender and extractions due to dental caries in the second quadrant. X-axis represents the gender and Y-axis represents the number of patients undergoing extractions of teeth due to dental caries in the second quadrant. Association between gender and extractions due to dental caries in quadrant 2 was done using Chi-square test and was significant. Pearson's Chi square test, p<0.013 (<0.05). Males had a higher prevalence of extractions than females in most numbers of teeth. 28 was the most commonly extracted tooth due to dental caries in both genders and it is statistically significant.

 Table 3: Table depicting association between gender and extractions due to dental caries in the third quadrant. (Pearson's Chi square test=25.320a, p=0.001 (<0.05), hence statistically significant. Males (55.0%) have a higher prevalence of extractions than females (45.0%). 38 (25.8%) is the most commonly extracted tooth due to dental caries in both genders and it was found to be statistically significant.</th>

			Tooth number (Quadrant 3)										
		31	32	33	34	35	36	37	38	276			
Gender	Male	199	200	166	172	188	460	352	520	2257			
	Female	143	137	104	134	155	343	288	539	1843			
Total		342	337	270	306	343	803	640	1059	4100			
					Chi Square tes	t							
								Value	df	Asymp. Sig.			
										(2-sided)			
Pearson Chi Square									7	0.001			

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Figure 7: Bar chart depicting association between gender and extractions due to dental caries in the third quadrant. X-axis represents the gender and Y-axis represents the number of patients undergoing extractions of teeth due to dental caries in the third quadrant. Association between gender and extractions due to dental caries in quadrant 3 was done using Chi-square test and was significant. Pearson's Chi square test, p<0.001 (<0.05). Males had a higher prevalence of extractions than females in most numbers of teeth. 38 was the most commonly extracted tooth due to dental caries in both genders and it is statistically significant.

 Table 4: Table depicting association between gender and extractions due to dental caries in the fourth quadrant. (Pearson's Chi square test=15.579a, p=0.029 (<0.05), hence statistically significant. Males (55.0%) have a higher prevalence of extractions than females (45.0%). 48 (24.3%) is the most commonly extracted tooth due to dental caries in both genders and it was found to be statistically significant.</th>

			Tooth number (Quadrant 4)									
		41	42	43	44	45	46	47	48	356		
Gender	Male	187	190	139	160	198	475	349	480	2178		
	Female	131	139	109	126	158	351	288	483	1785		
То	tal	318	329	248	286	356	826	637	963	3963		
				(	Chi Square tes	t						
								Value	df	Asymp.		
										Sia. (2-		

Pearson Chi Square



**Figure 8:** Bar chart depicting association between gender and extractions due to dental caries in the fourth quadrant. X-axis represents the gender and Y-axis represents the number of patients undergoing extractions of teeth due to dental caries in the fourth quadrant. Association between gender and extractions due to dental caries in quadrant 4 was done using Chi-square test and was significant. Pearson's Chi square test, p<0.029 (<0.05). Males had a higher prevalence of extractions than females in most numbers of teeth. 48 was the most commonly extracted tooth due to dental caries in both genders and it is statistically significant.

15 579a

sided)

0.029

7

 Table 5:
 Table depicting association between age group and extractions due to dental caries in the first quadrant. (Pearson's Chi square test=31.847a, p=0.000 (<0.05), hence statistically significant. The age group 41-50 (24.6%) has a higher prevalence of extractions than other groups. The prevalence was least in the age group 81-90 (0.8%). 18 (24.5%) is the most commonly extracted tooth due to dental caries in all age groups and it was found to be statistically significant.</td>

Tooth number (Quadrant 1)									
11	12	13	14	15	16	17	18	116	

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Age group	19-30	21	10	10	36	32	123	48	278	558
	31-40	28	32	26	80	90	140	98	286	780
	41-50	75	84	70	125	126	162	193	256	1091
	51-60	70	74	109	143	124	168	225	167	1080
	61-70	70	78	89	85	74	106	106	80	688
	71-80	20	27	24	40	29	28	25	19	212
	81-90	2	5	7	5	4	4	4	3	34
Tot	tal									
				•	Chi Square tes	t				
								Value	df	Asymp. Sig.
										(2-sided)
			Pearson (	Chi Square				31.847	7	0.000



Δ

Figure 9: Bar chart depicting association between age group and extractions due to dental caries in the first quadrant. X-axis represents the age group and Y-axis represents the number of patients undergoing extractions of teeth due to dental caries in the first quadrant. Association between age and extractions due to dental caries in quadrant 1 was done using Chi-square test and was significant. Pearson's Chi square test, p<0.000 (<0.05). The age group 41-50 has a higher prevalence of extractions than other groups. 18 was the most commonly extracted tooth due to dental caries in both genders and it is statistically significant.

 Table 6:
 Table depicting association between age group and extractions due to dental caries in the second quadrant. (Pearson's Chi square test=632.476a, p=0.000 (<0.05), hence statistically significant. The age group 41-50 (25.7%) has a higher prevalence of extractions than other groups. The prevalence was least in the age group 81-90 (0.8%). 28 (25.1%) is the most commonly extracted tooth due to dental caries in all age groups and it was found to be statistically significant.</td>

		Tooth number (Quadrant 2)									
		21	22	23	24	25	26	27	28	196	
Age group	19-30	24	14	6	34	35	104	53	284	554	
	31-40	22	29	26	63	79	173	106	319	817	
	41-50	72	84	87	106	132	183	214	265	1143	
	51-60	78	94	100	123	104	162	190	157	1008	
	61-70	72	72	92	85	77	98	113	70	679	
	71-80	19	30	30	29	28	29	32	16	213	
	81-90	2	4	5	4	4	6	6	4	35	
Tot	al	289	327	346	444	459	755	714	1115	4449	
					Chi Square tes	t					
								Value	df	Asymp. Sig.	
										(2-sided)	
			Pearson (	Chi Square				632.476a	42	0	
nnals of Med	lical and Hea	Ith Sciences I	Research   Vo	olume 11   Iss	sue S2   July 2	2021			36	9	



**Figure 10:** Bar chart depicting association between age group and extractions due to dental caries in the second quadrant. Xaxis represents the age group and Y-axis represents the number of patients undergoing extractions of teeth due to dental caries in the second quadrant.

Association between age and extractions due to dental caries in quadrant 2 was done using Chi-square test and was significant. Pearson's Chi square test, p<0.000 (<0.05). The age group 41-50 has a higher prevalence of extractions than other groups.

28 was the most commonly extracted tooth due to dental caries in both genders and it is statistically significant.

 Table 7: Table depicting association between age group and extractions due to dental caries in the third quadrant. (Pearson's Chi square test=887.191a, p=0.000 (<0.05), hence statistically significant. The age group 41-50 (22.5%) has a higher prevalence of extractions than other groups. The prevalence was least in the age group 81-90 (0.7%). 38 (25.9%) is the most commonly extracted tooth due to dental caries in all age groups and it was found to be statistically significant.</th>

		Tooth number (Quadrant 3)									
		31	32	33	34	35	36	37	38	276	
Age Group	19-30	12	8	4	6	18	214	100	350	712	
	31-40	40	31	12	19	39	147	138	270	696	
	41-50	105	107	50	58	82	170	145	208	925	
	51-60	92	93	82	87	82	141	138	112	827	
	61-70	71	71	81	94	86	94	74	86	657	
	71-80	20	22	36	37	34	34	42	30	255	
	81-90	2	5	5	5	2	2	3	3	27	
		342	337	270	306	343	803	640	1059	4100	
Chi Square test											
								Value	df	Asymp. Sig. (2- sided)	
Pearson Chi Square 887.191a										0.000	



Figure 11: Bar chart depicting association between age group and extractions due to dental caries in the third quadrant. Xaxis represents the age group and Y-axis represents the number of patients undergoing extractions of teeth due to dental caries in the third quadrant. Association between age and extractions due to dental caries in quadrant 3 was done using Chi-square test and was significant. Pearson's Chi square test, p<0.000 (<0.05). The age group 41-50 has a higher prevalence of extractions than other groups. 38 was the most commonly extracted tooth due to dental caries in both genders and it is statistically significant.

 Table 8: Table depicting association between age group and extractions due to dental caries in the fourth quadrant. (Pearson's Chi square test=771.521a, p=0.000 (<0.05), hence statistically significant. The age group 41-50 (21.8%) has a higher prevalence of extractions than other groups. The prevalence was least in the age group 81-90 (0.8%). 48 (24.2%) is the most commonly extracted tooth due to dental caries in all age groups and it was found to be statistically significant.</th>

			Tooth number (Quadrant 4)								
		41	42	43	44	45	46	47	48	356	
Age group	19-30	8	9	1	12	27	232	99	314	702	
	31-40	34	31	13	20	32	159	127	248	664	
	41-50	94	100	52	57	82	148	149	182	864	
	51-60	82	88	70	84	95	140	130	120	809	
	61-70	69	69	81	81	89	104	93	73	659	
	71-80	28	28	28	28	28	39	33	23	235	
	81-90	3	4	3	4	3	4	6	3	30	
Tota	al	318	329	248	286	356	826	637	963	3963	
	Chi Square test										
								Value	df	Asymp. Sig.	
										(2-sided)	
Pearson Chi Square								771.521a	42	0.000	



Figure 12: Bar chart depicting association between age group and extractions due to dental caries in the fourth quadrant. Xaxis represents the age group and Y-axis represents the number of patients undergoing extractions of teeth due to dental caries in the fourth quadrant. Association between age and extractions due to dental caries in quadrant 4 was done using Chi-square test and was significant. Pearson's Chi square test, p<0.000 (<0.05). The age group 41-50 has a higher prevalence of extractions than other groups. 48 was the most commonly extracted tooth due to dental caries in both genders and it is statistically significant.

## Conclusion

Within the limits of the present study, it can be concluded that extractions due to dental caries was more prevalent in the third

molars, in the age group of 41-50 years with a male predilection.

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### **Author's Contribution**

Fathima Bareera Rezvi performed the analysis, and interpretation and wrote the manuscript. Dr. M.P. Santhosh Kumar contributed to conception, data design analysis, interpretation and critically revised the manuscript. Dr. Manjary Chaudhary participated in the study and revised the manuscript. All the authors have discussed the results and contributed to the final manuscript.

## **Conflict of Interest**

The authors declare no conflict of interest.

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