

Assessment of Socioeconomic Factors in Relation to Cause of Extraction and Period of Edentulism Among Complete Denture Wearer of Rural Population of Punjab

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ABSTRACT

Background: Edentulism has a negative impact on the personality of the individual irrespective of its age. Loss of teeth not only affects appearance, function but also the psychology, restricting an individual for social activities. To assess the association of socio- demographic factors like age, gender, education level and employment status with reason of tooth loss and duration of edentulism in population of North Punjab.

Materials and methods: A survey was conducted on 500 edentulous subjects through a questionnaire and were enquired about their cause of tooth extraction and duration for which they remained edentulous. Socio-demographic variables were also recorded to see if any association exists. Patients were also asked about their knowledge regarding replacement of old denture.

Results: The obtained data was put to statistical analysis using SPSS VER 19. Results obtained: Out of 500 subjects, 219 were males and 281 were females. Although Periodontal diseases were the main reason for extraction in all the subjects irrespective of age, gender, education and employment status but was not found statistically significant. Most of subjects were unemployed but it did not seem to have any significant relation. A significant association was found with period of edentulism to age and employment as p value was <0.05.

Conclusion: Periodontal problems were the most common cause of tooth extraction in the present study conducted followed by caries and least common reason was periodontal – carious combination. Most of the subjects reported within one year of edentulism and duration of edentulism is strongly associated with age and employment. Further, people lacked awareness regarding replacement of old denture resulting in poor oral health.

Keywords: Caries, complete denture, denture needs, denture usage, geriatrics, edentulism, periodontal problems, reason for extraction, socio-economic status, socio- demographic factors and tooth loss.

INTRODUCTION

With the improvement in health sector, life expectancy has increased globally and India is no

exception to it. India is the second most populous country in the world after China with 1.37 billion

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population. India ranks fourth amongst nations with the highest number of elderly people i.e. 77 million people which corresponds to 7.7% of Indian population⁽¹⁾. As individuals age, their quality of life is strongly determined by their ability to maintain autonomy and independence. Geriatric people often present with ailing health and dental care is often neglected. Loss of teeth have a significant impact on the overall health of an individual as it devastates the physical as well as psychological well-being. Dental caries, periodontitis, orthodontics trauma, prosthodontics treatments and combinations of these have been cited as some of the reasons for tooth loss in available literatures. The distribution and prevalence of complete edentulism between developed and developing countries may be associated with a complex interrelationship between cultural, individual and socioeconomic factors and health⁽²⁾. Various surveys to know the exact cause of the tooth loss have been conducted in different countries. The results of these surveys are controversial regarding whether periodontal or carious diseases are the main cause of tooth loss⁽³⁻⁵⁾ while WHO database indicate that dental caries is prevalent in majority of countries with some reporting 100% incidence in their populations, severe periodontal disease is estimated to be 5-20% of the population and the incidence of complete edentulism has been estimated between 7% and 69% internationally.⁽⁶⁾ Additionally, the influence of socio-economic and socio-demographic factors on edentulism have been well documented in the past literature.

The importance of period of edentulism is also very important for maintaining the good oral health. The time of edentulism is the time period for which the patients have been completely edentulous. Edentulism is found to be a significant factor on residual ridge resorption, which leads to reduction in height of alveolar bone and the size of denture bearing area due to ongoing process of bone loss after extraction affecting mandible four times then maxilla.

Also, several people in our country are unaware about the period of denture usage. Generally, a denture should be worn by patients for 4-5 years but patients may wear their denture for more than 10 years which leads to psychological attachments and poor oral health. Till now, there is no well documented literature establishing the relation of

period of edentulism to socio- demographic factors such as age, gender, education and employment. Thus, the present study was conducted among population of northern Punjab.

AIMS AND OBJECTIVES

The study was conducted with the following aims and objectives:

1. Reason for the loss of teeth.
2. Association of age, gender, educational and employment status of the patients reporting for the replacement of teeth with the cause of extraction.
3. To study about the relation of period of edentulism to other factors like age, sex, education, employment.
4. Awareness about the replacement of old denture.

MATERIALS AND METHODS

The study was conducted through a questionnaire and was done randomly on 500 patients who reported for replacement of lost teeth.

Patients who fulfilled the following inclusion criteria were considered for this study:

- Age -40 to 80 yrs
- Completely edentulous patients
- Patients who had given informed consent for inclusion in the study

Patients were excluded if they -

- Had limited mental and physical abilities
- Who were not willing to be the part of this study?

Subjects were divided into the following groups:

1. According to age

Group I- Less than 50 yrs

Group II- 50- 60 yrs

Group III- 61- 70 yrs

Group IV- More than 70 yrs

2. According to education level

Group I- Illiterate
Group II- Primary education
Group III- Matric pass
Group IV- Secondary education
Group V- Graduation degree

3. According to Period of edentulism

Group I- Less than a year of edentulism
Group II- 5 yrs of edentulism
Group III- Patients edentulous for 10 yrs
Group IV- Patients reporting within 11-20 yrs
Group V- Patients who were edentulous for more than 20 yrs

2.1 Procedure for collection of data

A questionnaire was designed in local language(Punjabi) of patient which inquired about socio-demographic factors such as name, age, sex, education, occupation, duration of their edentulous state and reason of their tooth loss . It was completed by patient themselves

RESULTS

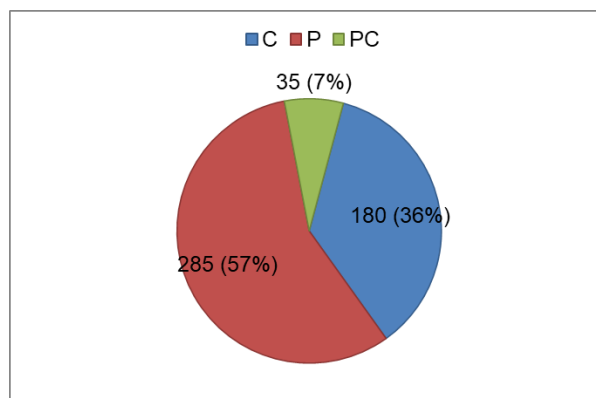
The results were prepared by SPSS version 19 .Five hundred patients consisting of 219 (43.8%) males and 281 (56.2%) females participated in the study. The majority of respondents were within the age group of 61-70 years (35.3%) and 51-60 years (28.7%).

Chart 1 depicted that the most common reason for tooth loss was due to periodontal problems (57%), followed by carious lesions (36%) and least due to periodontal and carious combination (7%)

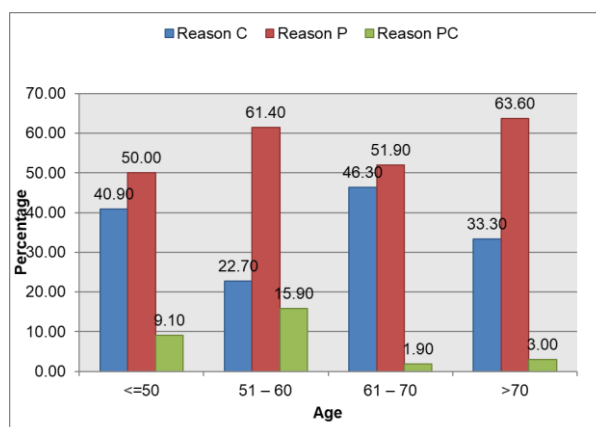
It was observed that the per centage of patients who lost their teeth due to periodontal reason in age group I, II, III,IV was 50.0%, 61.4%,51.9% and 63.6% respectively. Although, periodontal problems showed maximum prevalence but statistically, there was no association of age with reason as p value was non- significant.(Graph 1)

51.2% females and 64.2% males in the present study lost their teeth due to periodontal problems while 40% females and approx. 30% males undergone extraction because of caries (Graph 2). Periodontal diseases were more prevalent than caries followed by combined periodontal caries

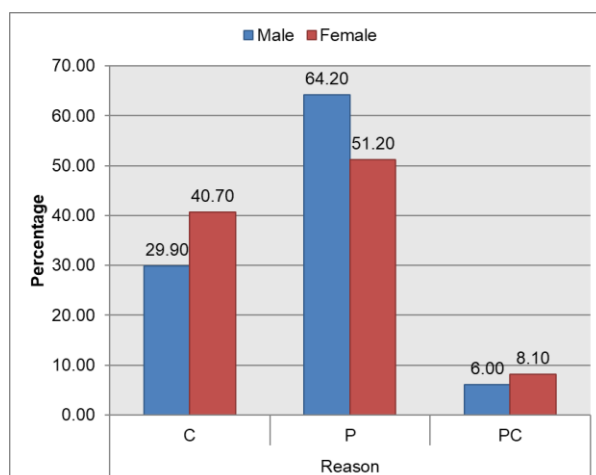
lesions in both the gender but no significant association could be established.



Graph 1: Reason of Tooth Loss.



Graph 2: Association between Age and Reason.



Graph 3: Association between Sex and Reason.

Graph 3 describes the distribution of subjects in five groups according to their education level. Periodontal reason had been remain the most common cause with maximum patients belonging to group III followed by group I ,group II then group V

and least in group IV. Number of subjects were same in group IV in both categories of carious and periodontal reason while it was nil in combination category. It was also observed that number of subjects in group V i.e. people who are graduated are least in combined periodontal caries category. Although, in all the groups periodontal diseases had been the main cause of tooth loss, still no association was proved between education and reason of tooth loss statistically.

Maximum subjects in the present study were unemployed. 56.4% unemployed patients had periodontal reason for extraction while only 8.2% subjects had combined periodontal caries lesion (Graph 4). Periodontal cause remain the main reason in employed category as well (58%). No direct association was established of employment of the subject with their cause of tooth loss.

Graph 5 shows the division of subjects in five categories according to the period they remain in edentulous state. Maximum patients belonged to group I i.e. reported within a year (44.4%). In group I, 57.4% of edentulous subjects were affected by periodontal problems followed by 35.3% who got extraction due to caries and least were due to combination cause 7.4%. 50% patients lost their teeth due to periodontal problems followed by caries (36.7%) and least because of combination cause (13.3%) in group II. Periodontal cause was the prevalent reason for loss of teeth among all the categories. No significant association with period of edentulism of subjects with their reason of extraction was established.

A significant co-relation existed between age and period of edentulism. It was observed that 72.7% subjects aging less than 50 yrs reported within a year while only 6% of subjects who were more than 70 yrs reported within 1 year of edentulousness. Overall, only 2% of subjects fall under group 5 i.e. came for denture therapy after a long span of edentulism of more than 20 yrs. (Graph 6)

No particular pattern was observed between males and females in relation to period of edentulism. 49% males and 40% females reported within a year and only 1.5% males and 2.3% females reported more than 20 yrs of edentulism. As p value was non-significant, no association could be developed with age to the period of edentulism. (Graph 7)

No significant pattern of increase or decrease was found with increase in period of edentulism (Graph 8). Also, it was evaluated that although 50% subjects having graduation degree reported within a year but the level of literacy was not statistically significant to affect the period of edentulousness.

A significant co-relation existed between employment of subject with period of edentulism (Graph 9). 70% of employed subjects reported within a year while only 34% unemployed patients came under 1 year. As seen in group IV i.e. 20 yrs of edentulism, 21% were unemployed while percentage was very low for employed ones (4.7%).

DISCUSSION

Edentulism is a poor public health outcome that substantially affects oral and general health status as well as the quality of life. It is an important but often-overlooked public health issue, especially among elderly population⁷. It is believed that with increasing age, oral and dental problems also increase⁸. Oral health plays an important role in the nutrition of adults and older people.⁷ Tooth loss has variable effects on different age groups affecting their quality of life. For an example, in case of infants and small children, tooth loss hampers speech and sucking while in teenagers, esthetics is a major concern and in geriatric people, it affects function depriving them from their favourite food which may lead to depression. Reduced masticatory efficiency may also restrict them to some foods which may lead to deficiency of essential nutrients.⁹

Edentulism rates among the elderly have been reported as relatively high in number of European countries such as England (74-79%), Scotland(85%), Ireland(72%), Northern Ireland(67%), the Netherlands(83%), Denmark(68%), Finland(67%) and Norway(57%). In Australia, 68% of people aged 65 or more were edentulous.¹⁰ This study was aimed to know the reason for tooth loss in completely edentulous patients and their association with socio-demographic factors such as age, sex, education level and employment status. These factors were also assessed statistically in relation to duration of edentulism.

In the present study, the most prevalent reason for tooth loss was periodontal problems (57%),

followed by carious lesions (36%) and then a combined periodontal and carious cause(7%)(graph 1). This is in accordance with the study done by Aderinokun and Dosumu⁽¹¹⁾ in which major reason was periodontal cause (61.9%) in which single episode can lead to loss of multiple tooth. O.O. Dosumu⁽¹²⁾ conducted study in U.C.H .Ibaden in which trauma accounts for the highest cause of tooth loss(40.9%), followed by caries(31.0%) while periodontal disease (19.2%) was the least reason. This contrast may be seen due to the young patients who participated in their study who lost tooth due to traumatic reason.

According to age-wise distribution, periodontal cause (56.9%)was the most prevalent reason with maximum patients belonging to age group of 61-70 (35.2%), followed by 51-60(28.7%), then greater than 70yrs(21.5%) and least to less than 50 years (14.3%)(graph no 1). When assessing age groups, periodontal cause had maximum prevalence with percentages as 50.0%, 61.4%,51.9% and 63.6% respectively. Thomas S⁽¹³⁾, observed that percentage of edentulism in 60-64 years was 11.1%, in 65-74 years as 19.4% and in 75+ age group as 32.3% . Hosanguan C ⁽¹⁴⁾, conducted study on 623 elderly between age group of 60-74 years and found that level of edentulousness was 13.5%. Treasure E¹⁵ et al observed that people with over 75 yrs of age were 144 times more likely to have lost all their teeth as compared with subjects aging between 16-44 yrs of age. Our survey showed results in accordance with both these studies with a slight difference in percentages but no direct association of tooth loss with age of the patient.

In the present research, total 500 patients participated, 281 were females and 219 were males. The tendency of females being more edentulous than males is consistent with some studies^{6,7,16,17} and is contrast with study by Elizabeth.⁽¹⁸⁾ However, according to Suominen Taipale, this difference had almost disappeared in his later study. In females, maximum subjects lost their tooth due to periodontal cause (51.2%) followed by caries (40.7%) and least by combination of periodontal and carious lesions (8.1%). In males, periodontal problems were most prevalent reason for tooth extraction (29.9%), followed by carious lesions (64.2%) and then by combined PC problems (6%) (Graph 2). But the reason of tooth loss presented no

direct association with sex of the patient statistically.

Another interesting fact was that no significant association was found between education level and cause of tooth loss as in all the categories ranging from uneducated to graduated, periodontal diseases were more prevalent (56.9%). This is in contrast with the study conducted by Shah N.et al ⁽¹⁹⁾ in which tooth loss was higher with low level of literacy. While in multivariate analysis of Oral Health among elderly of UK, it was found that age and educational level had highest impact on edentulous levels. Persons with no qualifications were nine times and persons with qualification level below degree were four times as likely to be edentulous than with higher qualification ⁽¹⁵⁾. Education was found to be inversely proportional to complete edentulism in other studies as well. ^(20,21, 10, 22,23) This is in contrast to our present study.

According to the survey conducted, maximum subjects lost their tooth due to periodontal related problems irrespective of their employment status. 58.1% employed people and 56.4% unemployed subjects lost their tooth due to periodontal cause (Graph 4). Employment status seem to have no direct effects on reason for tooth loss. This is in contrast to study conducted by Shah N. ⁽¹⁹⁾, in which elderly people in low socio-economic group were more edentulous . This is attributed to the reason that they may not have either sufficient access or resources to seek dental treatment except getting dental extractions done, while higher socio-economic group may have received restorative, endodontic and other procedure done which reduces their level of edentulism. Differential treatment choices such as endodontic treatment versus tooth extraction also varies among the different socio-economic groups which further play a role in overall tooth loss phenomenon^(21,24).

The survey also assessed if there any co- relation existed between the cause of tooth loss and duration for which patient remained edentulous. In the present study, maximum number of patients (44.4%) reported within a year of edentulousness. This showed the awareness towards dental care irrespective of the reason of their extraction. In all the categories periodontal cause was the most prevalent reason. No similar studies have been found which evaluated the association between

these two factors. Thus, it's a new factor taken into consideration in the present study. Our study concludes that there is no direct relation of reason of tooth extraction to period of edentulism .

Assesing the association between age and period of edentulism, it was evaluated that with increasing years of period of edentulism and age , the number of patients kept on decreasing. 72.7% subjects aging less than 50 yrs reported within a year which definitely suggest that people are aware of their dental needs and hence, reported early to the dentist. No patient aged below 50 yrs reported after 10 yrs of being completely edentulous. Therefore, a definitely significant co- relation exist between both these factors i.e. age and period of edentulism. There are no significant similar studies which compared these factors.

49%males and 40%females reported within a year of edentulism while 19%males and 16% females reported with 10 yrs of edentulism. After 20 yrs of being completely edentulous, 17%females reported while males were only 14%. This may be due to the reason that males go outside from the house for work and also get their treatment done while females are busy in household chores. Due to lack of awareness, financial difficulties and dependency on males, females remain completely edentulous for a longer period of time than male counterparts. There was no significant difference between males and females when assessing the relation between gender and the duration of edentulous state statistically.

It was observed that although the subjects having graduation degree reported within a year but the level of literacy was not statistically significant to affect the period of edentulous. Irrespective of the period of edentulism, maximum number of patients belonged to under 10th grade education(38.5%). No significant relation between both factors was found. Similar comparative studies have also not been found to provide a reliable evidence on these factors.

According to the survey , it was found that unemployment affects the edentulous factor. The unemployed people are almost triple the employed ones. Overall, a significant trend of decreased patients was seen with increasing period of

edentulism. Thus, both the factors presented a significant co relation with each other .

In this study, several new factors have been evaluated which presents with quite interesting results. The relation of period of edentulism with factors like age, sex, education and employment are first to be evaluated in this study. Age and employment seem to be inversely proportional to the period of edentulism.

It was also observed in the present study that there was a lack of knowledge about denture wearing and related other instructions about time period of wearing a denture, its cleaning and storage etc. Many elderly people are unaware about these factors and tend to use a denture for more than 4-5 years and some have used for more than 20 yrs as well which negatively affects the oral health. They get psychologically attached to their denture and find difficult to adapt to new denture. Oldest denture age as observed in study by MS Shetty was 28 years.²⁵ Epulis, loss of vertical dimension and reduced masticatory efficiency are some of ill-effects of prolonged usage of same denture. It was seen that mostly patients who replaced their denture after 1 or 2 yrs. were not satisfied with their denture. It is the solely responsibility of the dentist to impart knowledge regarding denture wear to the patients at the time of insertion.

CONCLUSION

On the basis of results obtained following conclusions were drawn-

1. Periodontal cause was the main reason for tooth loss in the subjects.
2. Female subjects were more edentulous as compared to male subjects.
3. Most number of edentulous subjects were present among group III (61-70 years).
4. Education level did not seem to affect the edentulism among the patients.
5. Unemployed subjects were greater in number than employed ones but employment had no significant association with edentulous status of patients statistically
6. Maximum number of subjects in the study reported under 1 year of edentulous period.
7. Age and employment showed inversely proportional relation to period of edentulism.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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