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Tooth Loss Status and the Prevalence of Dental Restorations Among the Population of the Kingdom of Saudi Arabia

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Abstract

Tooth loss, a prevalent global health issue affecting 2.3% of the population, is a leading contributor to disability-adjusted life years (DALYs). Primarily driven by untreated dental caries, tooth loss detrimentally impacts function, aesthetics, and psychological well-being. Despite advancements in dental education and conservation, evolving oral diseases heighten the risk of tooth loss in adulthood. Dental implants, with a 96% success rate, are a preferred solution; however, awareness varies globally, hindered by cost and fear of surgery. This study explores tooth loss trends in Saudi Arabia, where estimates suggest 73-78% of the population may be toothless. Dental caries, affecting 24-70%, and periodontal disease (30-50%) contribute significantly. Trauma, particularly in younger age groups, is also a notable factor. Dental restorations, vital for managing tooth loss, are hindered by financial constraints, limited access, and cultural perceptions, with prevalence ranging from 10-20%. Strategies to combat tooth loss in Saudi Arabia involve public health initiatives, educational programs, and community-based interventions. Factors contributing to tooth loss, including limited fluoride intake, excessive sugar use, poor dental hygiene, restricted access to care, and cultural influences, must be addressed. Interventions include public health campaigns, education programs, community initiatives, cost reduction measures, and cultural campaigns dispelling dental health myths.

Keywords: Tooth loss, Dental caries, Periodontal disease, Dental implants, Saudi Arabia, Oral health, Dental restorations

Full-length article

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1. Introduction

One of the 100 harmful health disorders that impact people worldwide is tooth loss, which is also one of the most common oral conditions. Tooth loss accounts for 7.6 million disability-adjusted life years (DALYs), making it the largest source of DALYs among all oral disorders. Untreated dental caries is the most frequent Global Burden of Diseases (GBD) worldwide, affecting 2.5 billion people [1]. This is concerning because the most prevalent precursors to adult tooth loss are caries and periodontal disease [2]. According to a 2014 survey, 158 million people, or 2.3% of the world's population, were edentulous. The study also revealed that, despite a 45% decline in the total population, the worldwide prevalence of age-standardized tooth loss dropped from 4.4% to 2.4% between 1990 and 2010. Very little data usually comes from the developing world, and the few reports from affluent nations that directly enable attempts to accurately estimate tooth loss are challenging [3].

Despite the fact that conservation is the prevailing attitude in dental education and practice, the time-dependent evolution of oral illnesses increases the risk of tooth loss in maturity, making tooth removal frequently inevitable [3, 4]. It continuously impairs not only one's ability to function and look well, but it also has a negative psychological effect and lowers one's quality of life [5, 6]. Dental caries is the most frequent cause of tooth loss, although there are other variables as well, including trauma, periodontal diseases brought on by bone loss that causes tooth mobility, and caries itself. Dental implants, removable partial dentures, and fixed partial dentures are some of the alternatives available for replacing lost teeth. When replacing a tooth, dental implants are the first option because they have a high success rate of 96% and can last for 15 to 20 years. Researchers found that patients are generally quite satisfied (above 80%) with their fixed implant.

Numerous research have been carried out to determine patients' awareness of implants in various nations; nevertheless, the level of awareness varies from 23% to 79%, and other studies have found that in 86.5% of cases, patients' inability to choose implants was due to their high cost. Another drawback of implants was that, in 68.6% of cases, they required extended treatment times due to the need for bone implantation, which made patients fearful of surgery [1]. In 2002, the Swiss National Health Survey found that 13.1% of people between the ages of 65 and 74 had complete dentures, making up 89.5% of the population that needed dental restorations for rehabilitation. As people age, the prevalence of dental restorations rises, reaching 97.4% in those 85 years of age and beyond. However, among patients with removable dentures in that representative population sample, the frequency of dental implants was less than 1%.

Sweden had the greatest prevalence of dental implants among edentulous people in Europe, while it was still below 8% [3]. As a reflection of the general oral health state of the populace, tooth loss and the frequency of dental restorations are major concerns in the Kingdom of Saudi Arabia. Research indicates that between 73% and 78% of Saudis are thought to be toothless. Several causes, such as trauma, periodontal disease, and tooth caries, are responsible for this high frequency.

In Saudi Arabia, dental caries, also referred to as tooth decay, is a significant cause of tooth loss. Estimates of the prevalence of dental caries range from 24% to 70%, which is a pretty high rate. This is ascribed to elements including insufficient dental hygiene habits, excessive sugar intake, and poor fluoride usage. Infections affecting the gums and tooth support structures, known as periodontal disease, are another major reason for tooth loss in Saudi Arabia. According to estimates, periodontal disease affects between 30% and 50% of people. The tissues supporting the teeth may eventually be destroyed by this illness, which could result in tooth loss.

In Saudi Arabia, trauma—especially accidents and injuries—also plays a role in tooth loss. Even though the precise prevalence is not entirely known, it is thought to be a significant factor, particularly for younger age groups. Dental restorations, such as fillings, crowns, and bridges, play a crucial role in managing tooth loss and restoring oral function. The prevalence of dental restorations in Saudi Arabia is relatively low, with estimates ranging from 10% to 20%. This is attributed to various factors, including financial constraints, limited access to dental care, and cultural perceptions. Improving oral health practices, promoting preventive measures, and enhancing access to quality dental care are essential strategies to address tooth loss and increase the prevalence of dental restorations in Saudi Arabia. Public health initiatives, educational programs, and community-based interventions can play a significant role in promoting oral health and reducing the burden of tooth loss among the population.

2. Factors Affecting Dental Restorations and Tooth Loss

The high rate of tooth loss and low rate of dental restorations in Saudi Arabia are caused by a number of variables. Among these are:

- Minimum amounts of fluoride intake
- excessive use of sugar
- Insufficient dental hygiene habits
- restricted availability of dental care
- Techniques for Resolving Dental Loss and Encouraging Dental Restorations.

So that, a number of tactics can be used to combat tooth loss and encourage dental repairs. Among these tactics are:

- Public health campaigns to encourage good dental hygiene
- Programs for educating people about the value of good oral health
- Community-based initiatives to improve dental care accessibility
- Measures to lower the cost of dental treatment.
- Cultural campaigns aimed at dispelling myths regarding dental health

To collect our data, we built a survey that was distributed to different groups in our population to test what is the attitude of our society toward Tooth Loss Status and the Prevalence of Dental Restorations Among the population of the Kingdom of Saudi Arabia, the data was rearranged in tables and analyzed with descriptive statistical tools and ANOVA test. The first analysis for our survey was held and gave us the following results for our sample of 98 participants, the participants were distributed as: Sex (male [68], female[30]), Age(20-39[50], 40-59[24], >60 [24]), Nationality(Saudi[88], non-Saudi[8], blank[1]), Month Salary(<1000SR[7], 1000-5000[12], >5000[79]), Education(Secondary[9], University[89]), Social state(Married[82], Unmarried[16]), Location (village[7], country[91])

3. Data Analysis

To find the relation between our independent variables and the questionnaire answers, we use ANOVA Test for each group. From the table above, we can see that for the sex variable ($p > 0.05$) so the hypothesis is accepted and there is no relation between the samples answers according to their sex, and so that both males and females have the same attitude to the questionnaire answers, we can see that the we can see that for the Age variable ($p < 0.05$) it lead us to reject the hypothesis and As long as there is a relation between the samples answers according to their age, as is apparent for the Nationality variable ($p < 0.05$) so that we can reject the hypothesis and say that there is a relation between the samples answers according to their Nationality, the salary variable ($p > 0.05$) so that we can accept the hypothesis and say that there is no relation between the samples answers according to their salary, we can see that for the education variable ($p > 0.05$) so that we can accept the hypothesis and say that there is no relation between the samples answers according to their education we can see that for the social status variable ($p < 0.05$) so that we can reject the hypothesis and say that there is a relation between the samples answers according to their social state, and from the table above, we can see that the for the location variable ($p > 0.05$) so that we can accept the hypothesis and say that there is no relation between the samples answers according to their location.

4. Discussion

The purpose of the study is to look at the demographic traits of a sample of 98 Saudi Arabian participants and see if there is any relationship between those traits and markers of dental health. Numerous factors are included in the analysis, such as location, social status, education level, age, sex, and nationality, as well as monthly wage. Potential patterns and trends are illuminated by descriptive statistics, which offer insights into the central tendencies, variabilities, and distributions within each variable. The sample's sex distribution shows that there are more men (68) than women (30). The sample is predominately male, as indicated by the mean sex value of 1.31. Given that the mean is shared by the mode and median, the distribution appears to be reasonably symmetrical.

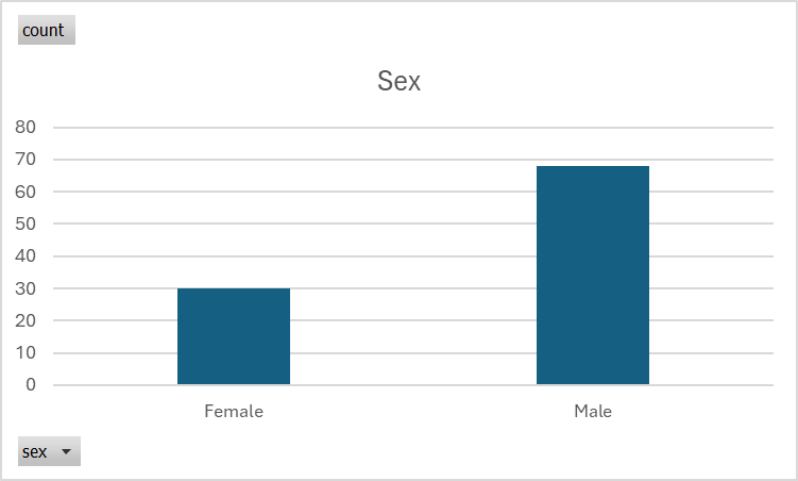

Figure 1. Sex

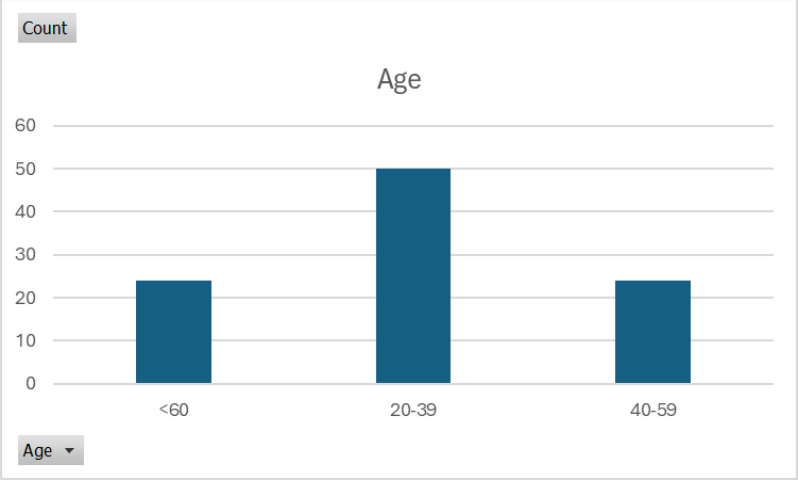

Figure 2. Age

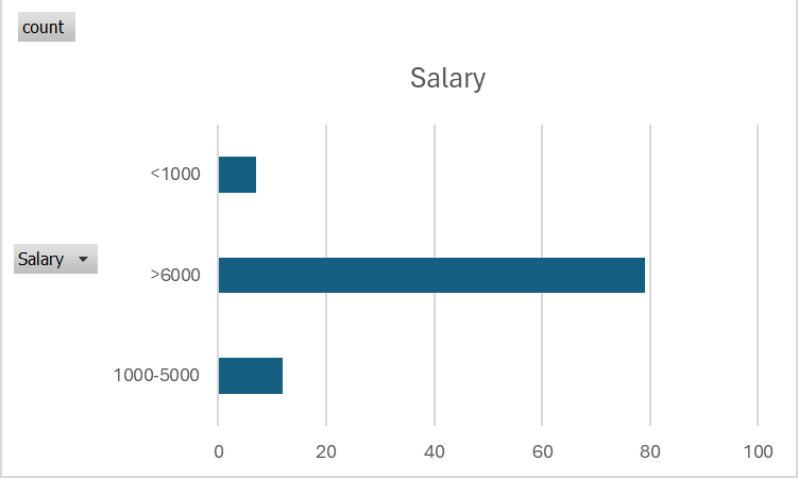

Figure 3. Salary

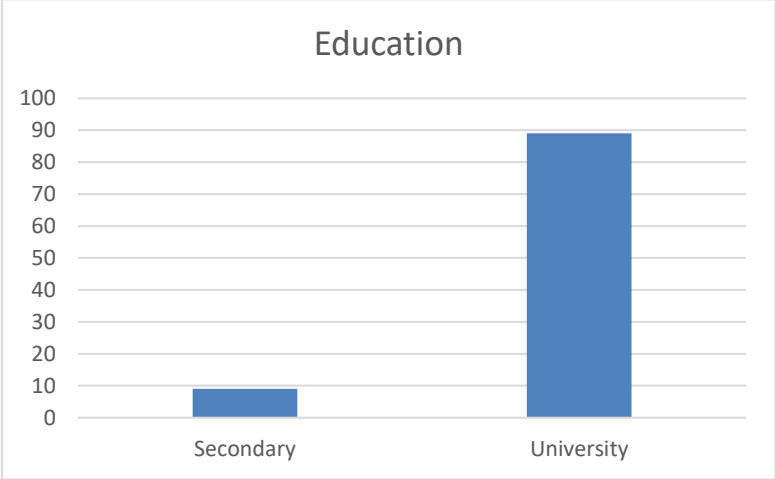

Figure 4. Education

Table 1. The descriptive statistics for the independent variables

	Sex	Age	Nationality	Month Salary	Education	social State	Location
Mean	1.31	1.73	2.06	2.73	1.91	1.84	1.07
Standard Error	0.05	0.08	0.03	0.06	0.03	0.04	0.03
Median	1.00	1.00	2.00	3.00	2.00	2.00	1.00
Mode	1.00	1.00	2.00	3.00	2.00	2.00	1.00
Standard Deviation	0.46	0.83	0.32	0.58	0.29	0.37	0.26
Count	98.00	98.00	98.00	98.00	98.00	98.00	98.00

Table 2. ANOVA test results for each group

Variable	Groups	Count	P-Value
Sex	Male	68	0.0017
	Female	30	
Age	20-39	50	0.0001
	40-59	24	
	>60	24	
Nationality	No Answer	2	0.003
	Saudi	88	
	Not Saudi	8	
Salary	<1000SR	7	0.59
	1000-5000	12	
	>5000	79	
Education	Secondary	9	0.28
	University	89	
Social State	Not Married	16	0
	Married	82	
Location	City	91	0.78
	Town	7	

There is no statistically significant correlation ($p > 0.05$) found in the analysis between sex and survey replies. The higher percentage of men, however, might call for more research into any potential gender-specific oral health issues and knowledge levels.

Participants are divided into three age groups based on the age distribution: 20–39, 40–59, and >60. With a standard deviation of 0.83 and a mean age of 1.73, there is a substantial amount of diversity. Age and survey replies have a statistically significant relationship ($p < 0.05$), according to the research. In light of the possible differences in dental care requirements and practices throughout age cohorts, further research is required to comprehend how various age groups see and manage oral health. Saudi natives make up the bulk of the sample (88 participants), with a tiny percentage (8) being non-Saudis. The nationality mean value is 2.06, indicating the predominance of Saudi individuals. According to the research, there is a statistically significant correlation ($p < 0.05$) between survey replies and nationality. This research highlights how crucial it is to take cultural and national contexts into account when developing oral health interventions because they might have an impact on behaviors and attitudes.

There are three categories for monthly salaries: <1000SR, 1000-5000, and >5000. With a standard deviation of 0.58 and a mean salary value of 2.73, there appears to be substantial income variability. No statistically significant relationship between pay and survey replies is found in the analysis ($p > 0.05$). It is important to take into account the possible impact of financial issues on access to dental care and preventative measures, even if income does not appear to directly influence oral health attitudes in this group. There is a large proportion of participants with a university education in the sample, according to the educational distribution (89). The sample is primarily educated, as indicated by the mean education value of 1.91. There is no statistically significant correlation ($p > 0.05$) found in the analysis between survey responses and schooling. The high degree of education, however, emphasizes how crucial educational initiatives are in raising public awareness of oral health issues and encouraging preventative measures.

Ninety-one percent of the sample is from the country, and the majority of participants (82), are married. The location (1.07) and social state (1.84) mean values point to rather stable social and geographic features. According to the analysis, there is no statistically significant correlation ($p > 0.05$) between survey replies and social state or location. Comprehending these demographic variables offers a framework for customizing interventions to particular social and geographic settings. In summary, this study provides insightful information about Saudi Arabia's dental health landscape from a demographic perspective. Even though age, nationality, and education level have strong correlations with survey results, further investigation and focused treatments are required to fully understand the complex interactions between these demographic characteristics and the population's oral health outcomes. The results also highlight how crucial it is to take social, cultural, and educational aspects into account when creating public health programs to address oral health issues in Saudi Arabia.

5. Conclusions

1. According to estimations, a considerable percentage of Saudi Arabia's population (73–78%) may become toothless, indicating that tooth loss is a major worry in the country. This emphasizes how urgently the nation's oral health problems require focused responses.
2. In Saudi Arabia, periodontal disease and dental caries are the two main causes of tooth loss. The prevalence of periodontal disease, which affects 30–50% of people, and dental caries, which affects 24–70% of people, highlights the significance of early intervention and preventive techniques in managing these oral health issues.
3. According to the study, dental restorations—which are essential for controlling tooth loss—face challenges like cost. Obtaining dental restorations is difficult in part because of limited access and cultural beliefs. This emphasizes the necessity of laws and programs that would increase dental care's accessibility and cost in Saudi Arabia.
4. Age may be a factor influencing attitudes toward the questionnaire answers, as the research shows a statistically significant relationship between participants' responses and age. Furthermore, nationality also has a big impact, meaning that different responses are given depending on the nationality of the individuals. Comprehending these demographic factors is essential to customizing oral health therapies that work.
5. With a 96% success rate, dental implants are promoted as the best option for replacing lost teeth. The report does, however, draw attention to awareness gaps around the world, with obstacles like cost and surgical anxiety. This emphasizes how crucial it is to launch focused awareness efforts and take other steps to increase acceptance and accessibility of dental implants, particularly in places like Saudi Arabia.

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