Section A-Research paper
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Assessment of Saudi Arabians' awareness of oral health and oral hygiene in a group of 200 dental clinic participants

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Abstract

Oral mucosa lesions cause oral sores, discoloration, and anomalies. Oral mucosa genetic and developmental disorders may affect anybody. Oral cavity carcinoma causes 4% of all malignancies worldwide. Early detection of oral cancer improves survival rates. Oral precancerous diseases include color, abnormalities, surface texture, and location that predict malignancy. The goal of this study was to examine the Saudi Arabians' awareness of oral health and oral hygiene. An observational, cross-sectional approach was adopted for the study. Individuals with a probable malignant oral disease who visited an OPD at a dental hospital and had relevant behaviors were recruited in the study. In Saudi Arabia, relatively little research has been done on probable carcinogenic illnesses and their links to cigarette and betel nut use. There are 200 dental participants in the survey, from one private and one public dental institution. Among the dentistry training institutes on the list are King Abdulaziz University's College of Dentistry and AlFarabi College for Dentistry and Nursing.An interventional study was carried out to assess and compare the impact of oral health education on the oral health status of people aged 20 to 60 living in institutions in the KSA. As a consequence, we may draw the following conclusion: health education can

help patients maintain better oral hygiene. The oral health education approach was shown to be an effective tool for educating these individuals the necessity of practicing appropriate dental hygiene. According to the findings of the research, Saudi Arabians' understanding of oral health and cleanliness may be enhanced if they participated in an acceptable program that included thorough monitoring and frequent dental checkups.
Keywords: Oral Cavity; Saudi Arabians' awareness; Dental mucosa lesions; Oral hygiene; Dental clinic participants

1. Introduction

Oral mucosa lesions manifest as sores, altered coloration, and morphological abnormalities in the mouth. Many genetic and developmental abnormalities of the oral mucosa may affect people of all ages. Many hereditary conditions manifest themselves with distinctive malformations of the oral mucosa due to abnormalities in a variety of tissue components. Oral manifestations of genetic diseases often followed the cutaneous or systemic manifestations of the illness, but in rare instances, the oral manifestations were the first indicators of the problem. Embryo developmental problems can cause a variety of oral abnormalities; some are common but insignificant, while others are extremely rare but extremely harmful, affecting not only the oral mucosa but also other oral cavity tissues (e.g., the palate, tongue, and gingiva) (Pinna et al., 2019).

Oral cavity carcinoma accounts for roughly 4% of all cancers and is a major global health issue. A broad range of diseases have been linked to the formation of mouth cancer (Moro et al., 2018). Early detection of cancer is critical since the odds of recovery improve dramatically when the oral tumor is discovered at an earlier stage. Color (red, red-white), irregularities (lack of homogeneity), surface texture (granular, verrucous), and position (floor of mouths, ventral or posterolateral edge of the tongues) are characteristics of oral precancerous disorders related to the probability of development into malignancy (Srivastava, 2019).

In 1978, the World Health Organization (WHO) recommended categorizing clinically identified manifestations of the oral cavity that are

identified as precancerous into two groups: precancerous lesions and precancerous states.

A precancerous lesion is a morphologically changed tissue that makes oral carcinoma more probable than its seemingly healthy counterpart. These premalignant lesions include oral leukoplakia (OL), oral erythroplakia, and reversed smoking' palatal tumors. A precancerous condition is a widespread illness that is connected with an elevated probability of malignancy. Oral submucous fibrosis (OSF), epidermolysis bullosa, oral lichen planus, and discoid lupus erythematous are all precancerous diseases. The phrase "possibly malignant diseases" was proposed to refer to precancer during a workshop organized by the WHO cooperating center for mouth cancer and precancer in the UK because it expresses that not all illnesses listed under this phrase could turn into carcinoma.

The use of smokeless tobacco and betel nut in different forms is highly common in the Indian subcontinent, and both have a role in the formation of potentially malignant oral disorders. Cigarette smoking and alcohol abuse are both involved in the genesis of oral cavity cancer, and the two seem to function in a coordinated manner. While both oral leukoplakia and oral submucous fibrosis are elevated preneoplastic states, the independent and interaction correlations among smoking tobacco, alcohol intake, and areca nut chewing in these oral illnesses have not been clearly documented. Minimal investigations on potentially oral disorders have been conducted in Saudi Arabia. As a result, the current investigation was carried out to examine the Saudi Arabians' awareness of oral health and oral hygiene.

2. Aim of research

This research aimed to identify Saudi Arabians' awareness of oral health and oral hygiene.

3. Questions of research

- How common are oral diseases?
- What is the level of awareness of oral disorders in Saudi Arabia?
- What level of knowledge does Saudi Arabia have about the negative consequences of tobacco smoking on oral health?

- What actions may individuals take to improve their oral health?

4. Literature review

According to Taberna et al. (2018), squamous cell cancer of the neck and head is largely a malignancy of elderly individuals, with the majority of cases happening in individuals over the age of 45. During the previous 20 years, epidemiology investigations have shown the prevalence of these malignancies has steadily increased in younger individuals (ages 18–45), particularly in tumors of the oropharynx and oral cavity.

According to Rock et al. (2018), cigarettes and alcohol have long been linked as traditional risk indicators for HNSCC in adults of all ages. People who eat greater than 100 g of sugar per day and smoke greater than 20 cigarettes each day are thought to be at a higher risk of developing oral epithelial dysplasia. Moreover, smoking tobacco drinking has been demonstrated to be a distinct risk factor for OCSCC in nonsmokers. Furthermore, these characteristics appear to exacerbate the cancerous impact.

According to Juarez et al. (2017), the oral cavity's local management has improved primarily due to more vigorous operative resection, assisted by current reconstructive procedures and radiation advancements. According to Parmar et al. (2021), postoperative chemoradiotherapy is thought to increase local management in individuals with elevated risk factors such as positive operational margins and extracapsular tumor growth. Nonetheless, distant recurrences continue to be a concern in individuals being managed for oral cavity cancer, this is an issue. Nevertheless, survival rates have only modestly increased during the last three decades.

Subramaniam et al. (2020) found no variation in the prevalence of a second main tumor among older and younger patients, and no variation across classes in cigarette and alcohol usage. Family history must be examined. Johnson et al. 2020 discovered a considerable proportional danger of squamous cell carcinoma if the first-degree families had HNSCC, especially if the beginning happened before the age of 50, in which case the risk rose over two-fold in the case of siblings.

5. Methods

5.1. Research Design

The research used an observational, cross-sectional design. Individuals with a potential cancerous mouth condition visiting a dentistry hospital's OPD with relevant behaviors were enrolled in the target group. In Saudi Arabia, very little investigation has been conducted on potential cancerous disorders and their associations with cigarette, and betel nut usage.

5.2. Study Population

The survey includes 200 dental participants from one private and one public dental institutions. College of Dentistry in King Abdulaziz University and AlFarabi College for Dentistry and Nursing are among the dentistry training institutions on the list. The above-mentioned dental education institutions in KSA are well acclaimed and available to individuals from all socioeconomic classes. This research comprised individuals who attended the hospital's Mouth Medical and Radiological unit between January 2021 and December 2022 and had a possibly cancerous condition on clinical assessment. Prior to beginning the trial, all individuals were told about the contents of the research and granted their informed permission.

5.3. Questionnaire

Information was collected utilizing a proforma that included a questionnaire and clinical evaluations. The research covered individuals of various ages. This study group comprises persons who have a background in smoking tobacco, betel nut, or betel leaf, as well as those who have precancerous tumors or abnormalities of the mouth. Individuals with possibly cancerous mouth disorders were recognized, and specifics were recorded in the proforma. Individuals with any health condition were barred from participating in the trial.

Addictions such as areca nuts, and cigarettes were highlighted. A complete background of all chewers and smokers' chewing and smoking behaviors was collected, comprising daily intake and length of practice. The regularity of alcohol use was acquired from users. The information collection for mouth mucosa diseases was relied on World Health

Organization papers. Each patient had a thorough clinic assessment to determine the location, size, and type of lesion. Leukoplakia was identified as a white spot or plaque that could not be classified as any other illness clinically.

Erythroplakia is defined clinically and pathologically as a brilliant red velvet patch that can be attributed to any other disorder. Individuals with a reversed cigarette habit and much more prominent palatal changes, such as erythroleukoplakic, were recognized as having reversed smoking palatal lesions. Lichen planus was defined as lacelike keratotic mucosal configurations with slightly raised fine white lines producing a lacelike sequence or a pattern of fine radiating lines; or keratotic alteration associated with mucous erythema. Discoid lupus erythematosus was diagnosed as red and slightly scaly regions favoring sun exposed regions such as the forehead, chests, back, and limbs, with center atrophy, scarring development, and lack of surface pigment, as well as mouth mucosal ulcerations associated with keratosis and erythema. Individuals who chewed betel nuts and complained of oral burn sensations and ulcerations, as well as eventually restricted mouth movement with rigidity of the mouth mucosa producing trismus and feeding difficulties, were identified with oral submucous fibrosis.

After the tentative diagnosis, every individual was sent for a sample and histological investigation. Individuals were discharged when the definitive diagnosis was made. They were lectured about the dangers of betel nut, cigarettes, and alcohol consumption and were directed to a mouth health and mouth surgery expert for additional treatments.

5.4. Statistical Analysis

Excel was used to store the information that was gathered. The entered data were examined to ensure they were consistent. Calculations of descriptive statistics such as proportions, means, and standard deviations might be accomplished with the help of this program.

5.5. Ethical Consideration

Approval was acquired from King Abdulaziz University's College of Dentistry and AlFarabi College for Dentistry and Nursing Administrative officials. Prior orientation was provided to all participants. Before beginning

the interviewing process and dental screening processes, participants were given a short introduction. All eligible respondents provided informed permission, and the study was conducted in accordance with the ethical standards stated in the Saudi Collage Statement.

6. Results

There were a total of 200 participants that met the requirements to be considered eligible for the research. The demographic information for the participants, including their ages and gender breakdowns, may be seen in (Table 1). Roughly two-thirds of those who took part in the study were female. Comparatively, there were almost three times as many participants in the age bracket of 20-35 years old as there were in the age of 36-60 years.

Table 1. Age and gender range of the study's respondents.

Age group	Male	Female	Total
20-35 years old	60	75	135 (67.5)
36-60 years old	20	45	65 (32.5)
Total	80 (40)	120 (60)	200 (100)

6.1. Oral sanitation procedures

It was shown that 93.7% of the people who took part in the study washed their teeth every day. Among the participants who brushed their teeth on a daily basis, more than half (80.3%) reported doing so for more than two minutes at a time. There were 140 people who participated in the research who used toothpaste to brush their teeth, while another 60 people (30 % of the total) used tooth powder. Only six of the participants admitted to using any substance other than toothpaste or tooth powder; the most common alternatives used included extracts from neem trees and coal powder, among other things. There were 130 people, or 65% of the total population, who admitted to being current users of some sort of tobacco. Smokers accounted for 65.4% of the people who used tobacco, while smokeless tobacco users made up 38.3% of the total. There were 40 people, or 20% of the total population of people who used tobacco, who used both smoked and smokeless forms of tobacco.

6.2. Problems with one's teeth and a reluctance to seek treatment

Approximately three-quarters of the participants, or 76.3 percent, reported having some sort of dental problem within the previous year. It was discovered that persons in the age ranges of 20-35 and 36-60 years had proportions of 67.5% and 32.5%, respectively, of those who had experienced a dental issue in the prior year, respectively. Sixty-four percent of people who had a problem with their oral health in the previous year went to the dentist, while just nineteen point three percent turned to home treatments. One-third of those individuals who sought medical assistance for dental issues went to a public health institution, while the remaining individuals went to a private health care facility.

A little less than half of the people who took part in the research (48.2% of them, to be exact) were aware of at least one of the best practices for preserving oral health, such as regular dental checkups or cleaning one's teeth. More than one-third of the people who took part in the study were aware of behaviors that are detrimental to dental health, such as consuming an excessive amount of sweets, sugar, or beverages that are sweetened with sugar. About one-fourth of the people who took part in the study were of the opinion that getting regular dental checkups is critical to maintaining good dental health.

6.3. Dental checkup and cleaning

The presence of dental caries was found to be 52.5% prevalent after an oral examination of all of the subjects. This difference between the age groups was determined to be statistically significant (Table 2). The percentage of persons with caries was greater in the age group of 36-60 years as compared to the age group of 20-35 years (76.9% vs. 23.1%).

Table 2. Proportion of people who have and lacking dental caries by age.

Age group	No. of people having dental caries (%)	No. of people without dental caries (%)	Total
20-35 years old	55 (40.7)	80 (59.3)	135 (67.5)
36-60 years old	50 (76.9)	15 (23.1)	65 (32.5)
Total	105 (52.5)	95 (47.5)	200 (100)

In spite of this, a statistically significant difference in the prevalence of dental caries between men and girls was not found to exist (Table 3).

Table 3. Proportion of people who have and lacking dental caries by sex.

Sex	No. of people having dental caries (%)	No. of people without dental caries (%)	Total
Male	65 (81.25)	15 (18.75)	80 (40)
Female	100 (83.3)	20 (16.7)	120 (60)
Total	165 (82.5)	35 (17.5)	200 (100)

As can be seen in (Table 4), researchers discovered a link between the use of tobacco products and the development of dental caries that was statistically significant (P = 0.05).

Table 4. Proportion of people who have and lacking dental caries by tobacco consumption.

Tobacco Consumption	No. of people having dental caries (%)	No. of people without dental caries (%)	Total
Yes	103 (73.6)	37 (26.4)	140 (67.5)
No	47 (78.3)	13 (21.6)	60 (32.5)
Total	150 (75)	50 (25)	200 (100)

It was discovered that the average DMF score percentage of the population under investigation was 52.5%, with a standard deviation of 7.9. The average DMF score was different between the age group; for example, it was 5.6 (40.7) for those who were between the ages of 20 and 35, while it was 14.1 (76.9) for those who were 36-60 years old.

In the current investigation, there were significantly more female participants than male participants (60 percent against 40 percent). It's possible that the date of the poll coincided with working hours, making it impossible to get in touch with the males; the bulk of the respondents were housewives.

The current research indicated that the prevalence of dental caries in the age range of 20-35 years was 40.7%, which is lower than the prevalence that

was stated in the WHO Oral Health Country Profile (94%) (Poorani and Chandana, 2015).

Table 5. The responses given by the people who participated in the research to the questionnaire about their level of expertise.

No	Questions	Response	Pre health education frequency n (%)	Post health education frequency n (%)
1	Do you have any idea what part sugar plays in the development of tooth decay?	i) Yes	93 (46.5)	188(94.5)
		ii) No	100 (50)	12(5.5)
		iii) Don't know	7(3.5)	0
2	What kind of effect do soft drinks have on teeth?	i) Yes	135(67.5)	196(98)
		ii) No	10(5)	4(2)
		iii) Don't know	55(27.5)	0
3	Is it feasible to avoid dental problems by practicing good oral hygiene, such as brushing, flossing, and avoiding sugary foods?	i) Yes	163(81.5)	178(89)
		ii) No	6(3)	2(1)
		iii) Don't know	31(15.5)	20(10)
4	Are you aware that utilizing fluoride in your toothpaste or tooth powder helps strengthen teeth?	i) Yes	180(90)	200(100)
		ii) No	18(9)	0
		iii) Don't know	2(1)	0
	Do you know smoking may	i) Yes	167(83.5)	175(87.5)

5	lead to mouth cancer and is bad for your health in general?	ii) No	21(10.5)	0
		iii) Don't know	12(6)	25(12.5)
6	Does the condition of one's mouth and teeth have an effect on the state of one's overall health?	i) Yes	57(28.5)	187(93.5)
		ii) No	46(23)	0
		iii) Don't know	97(48.5)	13(6.5)
7	Do any of your textbooks cover teeth and the various problems that can affect them?	i) Yes	176(88)	185(92.5)
		ii) No	10(5)	0
		iii) Don't know	14(7)	15(7.5)
8	Is it really essential to gargle with water after every meal in order to get rid of any leftover food particles?	i) Yes	172(86)	192(96)
		ii) No	22(11)	0
		iii) Don't know	6(3)	8(4)

The individuals' levels of knowledge are shown in Table 5 with regard to the many aspects that contribute to healthy oral hygiene. Before the educational intervention, only 46.5% of the participants were aware of the function that sugar plays in the development of tooth decay; after the intervention, this number jumped to 94.5%. The vast majority of responders (67.5%) were aware that drinking soft drinks might negatively impact teeth. Following the implementation of the educational strategy, there was a 98% increase in it. At the beginning of the study, 81.5% of the patients believed that preventing oral illness by brushing, flossing, and avoiding sweets was possible.

The vast majority of participants (90%) were aware that applying fluoride tooth powder or paste helps to strengthen teeth. Following the educational intervention, one hundred percent of the population was aware of the

advantages of using fluoridated tooth paste or powder. Following the educational intervention, the proportion of people who were aware of the negative effects of smoking on oral health increased to 28.5% and the proportion of people who considered oral health to be related to general health increased to 93.5% respectively. The study population was aware of the negative effects of smoking on oral health. After six months, this percentage improved to 86% from the initial baseline. Following each meal, approximately 89% of the people who participated in the study felt it was necessary to rinse their mouth with water. Following the educational intervention, that number increased to 96%.

7. Discussion

Numerous patients are required to receive daily oral health care, as it is an essential component of their overall health care. Oral health care should be regarded as an essential component of the treatment provided to patients. It is critical to make increased efforts to enhance the quality of oral health care that is provided to individuals in order to reduce the risk of any possible factors contributing to a patient's health deterioration (Linjawi et al., 2019; Ashour, 2020).

Teeth Caries is a condition in which cultural and sanitary practices play a significant role, and the illness's prevalence is strongly connected to these variables (Peres et al., 2019). It is very important to determine these characteristics because they have proven temporal and geographic stability and because they serve as a tool for customizing appropriate health education programs to address oral health issues, particularly among those who are in need. Caries is a disease that mostly affects adolescents and old people, and research conducted out in Saudi Arabia have shown that this is a significant issue (Bahannan et al., 2018; Alshammary et al., 2023). The conclusions of this survey indicated several numbers that demonstrate the inadequate level of oral health condition in Saudi Arabia. The investigation was carried out in Saudi Arabia.

The findings of this research are similar with recent investigations that show dental caries in Saudi youngsters is on the rise, and various variables are considered to be to blame. These determinants involve poor food habits,

poor dental hygiene, and service shortages, as well as pain-oriented health-seeking behavior among developing-country people (Murray Thomson, 2014; Die leman et al., 2017). Caries incidence is growing in several Arab nations as a result of latest industrial expansion, which has resulted in an increase in intake of refined sugars comparable to the majority of the developing world, particularly Africa (Alraqiq et al., 2022).

The findings of this research demonstrated that individuals with caries ingested cariogenic food more often than their caries-free counterparts. This is similar with the findings of earlier cross-sectional studies (Suresan et al., 2017; Echeverria et al., 2022), which found a link among poor oral hygiene practices and regular sugar consumption in Saudi children and caries incidence.

Given that the availability and utilization of fluoridated toothpaste offer a significant decrease in the incidence of caries (Peres et al., 2016; Pretty, 2016.), observations have demonstrated that just a fraction of the variability in caries can be attributed to nutritional factors. However, the connection among sweeteners and tooth decay can be challenging to determine due to the intrinsic constraints of the techniques for gathering data employed. Oral hygiene habits have been shown to act as the dominant parameter clarifying the greatest proportions of variance in caries.

The aforementioned statement is consistent with our findings, which indicate that poor eating habits, which are prevalent among individuals with dental caries. Consequently, the outcomes of our investigation are consistent with those of previous research indicating that a number of risk variables, such as poor oral hygiene, tobacco smoking, and eating routines that are regarded as significant indicators of the emergence of distinct caries, and demographic characteristics, which clinicians frequently disregard, might have an aspect in the reliability of caries (Attaran et al., 2016).

According to the findings of a survey of Saudi Arabians' awareness of oral health and hygiene, it is important to emphasize that many Saudis have insufficient understanding about the significance of oral health and cleanliness. Our finding reflect that poor oral health hygiene may lead to the development of precancerous and cancer oral disorders. These results are

consistent with Mathur et al. (2019), who stated that oral squamous cell carcinomas (OSCC) belong to the most frequent tumors in Southeast Asia. They discovered that poor oral hygiene is closely linked to oral malignancies. It increases the likelihood of cancer of recognized carcinogens such as smoke and alcohol. In compared to other nations, Saudi Arabia has a low level of knowledge about oral health and cleanliness (Farsi et al., 2020). This is a worrisome problem since research has indicated that the prevalence of oral cancer is growing in Saudi Arabia (Linjawi et al., 2019). As a result, there is a need for more comprehensive oral health education programs and efforts in Saudi Arabia to raise awareness and encourage excellent oral health habits among the general populace. Therefore, individuals may take actions to avoid the development of oral illnesses and enhance their overall health and well-being by increasing their oral health literacy (Al-Qahtani et al., 2020).

8. Conclusion

An interventional research was conducted to evaluate and compare the efficacy of oral health education on the oral health status of individuals aged 20 to 60 years old who were housed in institutions in the Kingdom of Saudi Arabia (KSA). As a result, we may get the following conclusion: health education is useful in assisting people in maintaining better dental hygiene. The oral health education model was shown to be a useful tool for teaching these participants the importance of maintaining proper oral hygiene practices. According to the findings of the study, the knowledge of Saudi Arabian people about oral health and oral hygiene may be enhanced if they participated in an appropriate program that included careful monitoring and frequent dental checkups.

9. Recommendations

The poor dental health of the survey participants is the consequence of insufficient oral health care, as well as a negative attitude and a lack of knowledge among those who visited dental facilities about how to solve these concerns. It has been advocated that:

1. Primary preventive strategies should be taught to individuals who regularly visit in dental institutions.

2. In order to better meet their requirements, the medical, dental, and social services should work together to coordinate their efforts. Individualized recall visits should be brought into schools by dental teams in order to execute preventative and therapeutic procedures, especially for those who are at a high risk of caries and periodontal disorders. These individuals should get the most attention.
3. Initiatives should be taken to reduce the prevalence of dental diseases by modifying the food served to reduce the amount of cariogenic substances consumed and by pushing for public health initiatives.
4. It is also recommended that individuals with a history of precancerous tumors should be monitored more closely by their dental healthcare providers, with more frequent checkups and screenings.
5. It is important to address any social determinants of health that may be contributing to poor oral health and the development of cancer, such as poverty and lack of education. Access to affordable dental care and education about oral health should be made available to all individuals, regardless of their background or socioeconomic status.

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