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Prevalence of Dental Caries Among Two Different W.H.O. Age Groups: An Observational Study

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*doi: 10.33472/AFJBS.6.Si3.2024.5656-5661***ABSTRACT:**

INTRODUCTION: Dental caries is most commonly found in school going children due to several reasons, which includes excessive sugar in diet, inappropriate oral hygiene, transition in their dentition & all the permanent teeth except for the third molars will erupt. For these factors, 12-year has been set as the global monitoring age for dental caries. However, because of their recessed gingival condition, older adults have a higher risk of developing root caries. Due to periodontal and dental issues, caries is most severe in the 65–74 age range.

AIM: To assess the prevalence of dental caries in 12-years and 65-74-years-old WHO index age groups.

METHODOLOGY: Total 400 subjects participated in the survey. 50% of the population consisted of students in Sisarma Senior Secondary School, Udaipur, Rajasthan, and the rest 50% consisted of the patients coming to the Department of Public Health Dentistry, Darshan Dental College and Hospital, Loyara, Udaipur, Rajasthan. The WHO Oral Health Assessment Proforma was used to record the patients' oral mucosal problems, dentition status, and treatment requirements. Version 26 of SPSS was employed for the statistical analysis. The significance level was set at 0.05 and appropriate tests were employed.

RESULTS: Study showed as the age increased the prevalence of dental caries increased with a significance level of 0.00. **CONCLUSION:** The prevalence of dental caries was found in both the age groups, but it was comparatively higher in age group of 65-74-years and is correlated with the various factors which are included in the study.

KEYWORDS: Dental caries, W.H.O. age groups, 12-years and 65-74 years.

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1. INTRODUCTION

Dental caries, commonly known as tooth decay, is a complex and dynamic disease driven by sugar, biofilms, and the phases of remineralization and demineralization of hard tissues in the mouth. It is one of the most prevalent long-term conditions globally, affecting individuals

throughout their lifespan. The disease involves interactions among salivary and genetic factors, carbohydrates, microbial biofilms, and tooth structure. Persistent demineralization can lead to carious lesions at susceptible spots on teeth surfaces. While pathogenic factors promote caries development, protective factors support remineralization and lesion arrest. Caries can affect both the crown and root surfaces of teeth, occurring in both primary and permanent dentitions.¹ The presence of discomfort or pain does not always correlate with the size of a carious lesion. Severe toothache from caries can lead to major systemic issues, including infection, tooth loss, and, rarely, treatment-related complications.² Modern dental care prioritizes caries risk analysis and preventive measures over immediate restorative treatments, focusing on plaque management to encourage remineralization and reverse the caries process.³ Globally, caries prevalence varies due to dietary habits and socio-economic factors. The 2017 Global Burden of Disease Study identified dental caries as the most common oral condition, affecting approximately 2.4 billion people with permanent teeth and 486 million children with primary teeth.⁴ Reliable statistics are crucial for health policy and effective care. The World Health Organization, has recommended conducting epidemiological research every 5 years in order to track changes in the prevalence of oral conditions and establish a worldwide database on the oral health.⁵ This study focuses on caries prevalence in two WHO index age groups: 12 years and 65–74 years, representing critical periods for dental health monitoring and planning adequate care for children and the elderly. There have been studies conducted across the globe for calculating the occurrence of dental caries within these groups, but very little literature is available in India for the same.

The majority of the studies' reporting was insufficient, therefore there wasn't much of this data available. Owing to the lack of available data, the current study is being conducted to determine the prevalence of dental caries in two WHO age groups: 12 years old and 65–74 years old.

2. METHODOLOGY

A descriptive cross-sectional survey was conducted from January to June 2023 at the Department of Public Health Dentistry, Darshan Dental College & Hospital, and Senior Secondary School, Sisarma, Udaipur, Rajasthan, India. The study received ethical approval from the Darshan Dental College & Hospital's ethical committee, and the principal of Senior Secondary School Sisarma granted formal permission. Informed consent was obtained from all hospital visitors and the parents of participating students.

TRAINING AND CALIBRATION :

The head of the Department of Public Health Dentistry standardized and calibrated the examiner to ensure consistent examination and interpretation of disease codes and criteria. This included a practice exam on 10 participants and two separate examinations on 20 participants over two days. Using kappa statistics, the intra-examiner reliability for the Decayed, Missing, Filled Teeth (DMFT) was found to be 90%.

SELECTION OF PARTICIPANTS:

- **INCLUSION CRITERIA**
 - Those who were available at the time of study.
 - Those who gave the informed consent.
- **EXCLUSION CRITERIA**
 - Those who were not willing to participate in study.

INTERVENTION/ INVESTIGATION/ EVALUATION OF PARTICIPANTS/ SPECIMENS:

- **Evaluation of Participants:**

The survey utilized the WHO Oral Health Assessment Form 1997 for adults and children, which served as the basis for a two-part proforma. The first section included a WHO Oral

Health Assessment questionnaire that gathered demographic data (name, age, gender, location, education, and years of experience) and information regarding dental status and treatment needs. The second section assessed dental caries using the WHO oral health proforma 1997.

- **Clinical parameters:** The clinical parameters assessed were dental caries.
- **Pilot survey:**

A pilot study involving fifty school-age children and adults was conducted to evaluate the feasibility and practicality of the survey and to determine the time required to examine each subject, which averaged fifteen to twenty minutes. The data from the pilot study were not included in the main research.

- **Organizing the survey:**

The survey schedule was carefully planned around the school administration's convenience, with a detailed schedule developed in consultation with the administration well in advance. The examination took place between January and June 2023. Despite comprehensive planning, only minor adjustments were needed during implementation.

Methodology: -

Before the study commenced, information about the school students of Sisarma, Udaipur, and adult patients visiting the Department of Public Health Dentistry, Darshan Dental College & Hospital (DDCH), Udaipur, was obtained. A list of students meeting the inclusion criteria was compiled, and the final sample size was determined. General information and dental caries data were recorded using the WHO Oral Health Assessment Form 1997, with findings documented using a mouth mirror and explorer.

CLINICAL ASSESSMENT & DATA COLLECTION

Examinations were conducted on designated days according to the schedule. Authorities provided a table, two seats, and a properly illuminated area for inspection. The class teacher was asked to bring students for examination in a controlled manner. The examiner and recording assistant ensured precise recording of findings, with the examiner positioned on the right side of the chair for optimal illumination. The clinical examination, adverse habits, food-related habits, and general oral hygiene practices were documented using a mouth mirror and an explorer, following the WHO's Type examination protocol. Each examination took an average of fifteen to twenty minutes. Throughout the study, 5% (50) of the population underwent duplicate assessments, achieving a 95% kappa statistic. Completed proformas were reviewed daily for accuracy and completeness. Participants needing emergency dental care were directed to a nearby dental clinic. On the last day of the visit, survey results were reported to the relevant authorities.

STATISTICAL ANALYSIS

Following compilation and entry into a spreadsheet using Microsoft Excel 2010, the recorded data was exported to the data editor page of SPSS version 26 (SPSS Inc., Chicago, Illinois, USA). Standard deviations, averages, and percentages were computed in descriptive statistics. Stepwise multiple linear regression analysis, one way ANOVA, t-test, and Pearson's chi-square test were the statistical tests that were used for the analysis. The p-value and confidence interval for each test were set at < 0.05 and 95%, respectively.

3. RESULTS

DMFT depending upon different factors (Significance level set at < 0.05).

The table shows a significant relationship between the prevalence of dental caries and age. It shows a significance level of 0.00 which depicts that as the age increases the prevalence of dental caries increases. The location does not have any impact on the prevalence of dental caries in 12 years with a significance level of 0.993 but is mildly significant in 65-74 years old with a significance level of 0.06 respectively. There is no relation between the prevalence of

dental caries and gender in 12 years as well as 65-74 years old age group with a significance level of 0.19 and 0.158 respectively. Males and females have equal chances of getting dental caries in the future. There is a direct association between DMFT and occupation in 65-74-years age group with a p-value of 0.000. There is no correlation between dental caries and ethnicity in both the age groups.

Table: Table showing co-relation between different factors and age groups.

FACTOR	AGE GROUP	P-VALUE
Age	12 & 65-74 years	0.000
Gender	12 years	0.19
	65-74 years	0.158
Location	12 years	0.993
	65-74 years	0.06
Occupation	65-74 years	0.00
Ethnicity	12 & 65-74 years	0.54

Note: The age group shows the age in years. A p-value less than 0.05 is typically considered to be statistically significant.

4. DISCUSSION

The prevalence of dental caries in 2 different WHO age groups 12 years and 65-74 years have been found to be associated with various factors, such as age, gender, ethnicity, location, occupation and the periodontal status of a person. With the present study population examined it can be said that the prevalence of dental caries is directly proportional to age with a p-value of 0.000, which was determined in both 12 years and 65-74 years of age group. Janakiram C et al (2018)⁶ stated that the prevalence of dental caries at 12-years was 45% and highest prevalence of dental caries of 85% was found among the 65-74-year-old. Taking into consideration the gender it was found that there is no relation between gender and dental caries in both the age groups. However, Lipsky M et al (2021)⁷ concluded that men are more likely to ignore their oral health and have poorer oral hygiene habits with a male to female ratio of 2:1 for oral cancer. In our study, ethnicity seemed to play no role in the prevalence of dental caries. The religion did not play any role on the DMFT score whether in 12-years-old or 65-74-years-old. The location seemed to be non-significant to younger children of 12 years, whereas it is mildly significant in 65-74 years age group. Maru A et al (2012)⁸ in research showed that the caries prevalence as well as dental treatment needs in the rural areas was quite high; prevalence of 87.8% and more than 60% of the study sample needed restorative treatment on at least one tooth surface.

In adults, occupation played a positive significant role in prevalence of dental caries. It was found that the unemployed farmers had higher chances of caries with a significance level of 0.000 as compared to adults in other employed population of the same age. Guerrero et al (2023)⁹ in their study showed that occupation have a positive correlation with dental caries.

5. CONCLUSION

In conclusion, the prevalence of dental caries in 2 WHO age groups 12 years and 65 to 74 years is found to be higher mainly in the elderly group due to the various factors described above. It will not be wrong to say that if you want to enjoy healthy tooth in the adult life it is better to start caring about them since the very beginning. To improve the overall oral health in both these age groups proper oral health care and awareness programs are required.

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