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Original Research Article

Awareness about the role of physical activity and diet on oral health and respiratory health: a questionnaire based cross sectional study

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ABSTRACT

Background: This cross-sectional study was carried out to assess the awareness of role of diet in oral and systemic health and their inter-relationship amongst the general population of Jodhpur city, Rajasthan.
Methods: A cross-sectional epidemiological survey was conducted 800 subjects of Jodhpur city Rajasthan region and a self-constructed questionnaire was used to collect the information. Here patient's awareness for periodontal-systemic health inter-relationship was also assessed by questionnaire. Study is started conducting from 15th August 2023 to 25th July 2024. Study was completed in 11 months 10 days.
Results: It was observed that majority knew about role of diet in oral and respiratory health whereas many of them were not much aware about association of periodontal and systemic conditions which was statistically significant.
Conclusions: There is an imperative call for ample educational programs to promote good oral hygiene awareness and its impact on systemic health amongst the general population.

Keywords: Awareness, Gingival health, Oral health, Oral hygiene, Periodontitis, Systemic health

INTRODUCTION

Oral health and general health are intrinsically linked to each other. Oral health-related diseases frequently share familiar risk factors to many of the major chronic diseases.[1] In today's state of affairs, our sedentary lifestyle is leading to many health-related issues, general as well as oral. Among them primarily are non-infectious or non-communicable diseases (NCD) which cannot spread from person to person. They are mainly of 4 types among general ailments including cardiovascular disease (CVS), chronic respiratory disease, cancer and diabetes.[2,3]

As per the WHO report 2020, around 41 million deaths occur due to these conditions every year. Health and disease have been two prime factors which have had left a profound influence on humans and humanity throughout the history of human race. Health is fundamental to productive life and it is the prime determinant of quality of life. Oral health can be defined as a standard of health of the oral and related tissues that enables an individual to eat, speak, and socialize without active disease, discomfort, or embarrassment, and that contributes to general well-being. (Department of Health, London 1994).[4]

It's mandatory to find out about their current status regarding knowledge towards interrelationship of oral health and systemic health and various followed practices for maintaining the oral health. Very few studies have been conducted correlating the oral hygiene practices and the awareness regarding inter-relationship between

periodontal and systemic diseases. Thus scarcity of literature impelled us to conduct this epidemiological study in order to find out about awareness about the role of physical activity and diet on oral health and respiratory health in Jodhpur city Rajasthan Region.

Hence, aim of the study was to assess the awareness of role of physical activity and diet on oral health and respiratory health.

METHODS

The Questionnaire based cross-sectional study was conducted in the Jodhpur city, Rajasthan region which was located in northeastern part of India. A cross-sectional survey was carried out among 800 subjects who gave their consent for participating in the study between the age group of 18 to 54 years. Study was conducting from 15th August 2023 to 25 July 2024. Study is completed in 11 months 10 days.

Inclusion criteria

This age group was chosen for better comprehension and understanding for the study along the basis of convenient judgment sampling. Subjects who were above 18 year and below 55 years of age, who gave informed consent and who were present on the day of examination were included in the study.

Inclusion criteria

While, subject not willing to participate, with systemic disorder like congenital heart disease, existing hypertension and diabetes, history of epilepsy, asthma and chronic renal disease and with oral disorders condition that limit them from oral examination in were excluded.

Ethical approval was received from the institutional review board and informed consent was obtained from all the study participants. Participation in the study was voluntary and confidentiality of data was maintained. A self-constructed questionnaire was formulated by two step approach both in English and in Hindi version containing questions regarding physical activity and diet and periodontal systemic health inter-relationship along with demographic details.

Questionnaire validation

The questionnaire was pretested by conducting a pilot study on 160 patients who comprised 20% of the study sample. Reliability of the questionnaire was assessed using Test-Retest and the values of measured Kappa (k) were 0.86 and Weighted Kappa (k) was 0.9. Internal consistency of the questionnaire was assessed by applying Chronbachs-Alpha (α) and the value of α =0.78 were obtained.

Training and calibration of the examiner

Before commencing the study, investigator was trained and calibrated in the Department of Public Health Dentistry. The training and calibration was done on the 25 subjects who were examined by the validator and subsequently by the investigator. The intra examiner variability was determined by carrying out the examination on 25 subjects twice on successive days. These subjects were preselected and represented the full range of condition expected to be assessed in the actual study. By comparing the results of the two examinations the diagnostic variability based on Kappa Coefficient came out to be 87% (0.87) which is in the acceptability range of 85-95% as recommended by WHO Basic Oral Health Survey 2013. To check for the examiner variability in the application of diagnostic criterion during the survey, the duplicate examinations were carried out on 30 subjects during the course of the survey.

Recording Clerk

The examiner was accompanied by the recording clerk who was also a dentist and well versed with the indices used and coding system. Before the main study, the clerk was made to practice the recording of the findings during the pilot study and mistakes and omissions were rectified.

The examination of the subjects was carried out in the village, under natural daylight conditions. The natural light was assisted by artificial battery light in cases where the proper illumination of the oral tissues could not be achieved with the natural light.

Data collection

Among the 800 selected subjects, healthy sound teeth were only considered to be functional to record the dental status of the patient. Mobile teeth (grade II and grade III), grossly carious teeth, root stumps and impacted teeth were excluded from the counting. OHI-S index were recorded with the help of mouth mirror and explorer.[11]

Statistical analysis

The collected data were analyzed using statistical package for social sciences (SPSS) 22.0 and descriptive tests as well as analytical tests including mean, standard deviation and chi square tests were used.

RESULTS

The present cross sectional study was carried out on 800 subjects and study included 472 (59%) male and 328 (41%) female patients. The number of subjects in 18-35 years' age group was maximum i.e. 507 (63.3%). Only 3.2 % of the study population was illiterate and about 22.5% were having postgraduate degree.

Important findings in results

Response of various questions regarding role of diet in oral and respiratory health among studied subjects. In this section of results we find the most of the population is unaware about role of balanced diet in oral and respiratory health. In the other section of results we concluded with most of the population is aware about importance of general health and exercise is related with oral and respiratory health.

Table 1: Response of various questions regarding role of diet in oral and respiratory health among studied subjects.

Question	No, %	Yes, %	Mean	Std. Deviation	Chi square	P value
Vitamins role in gingival health	66.7	33.3	0.67	0.330	11.533	0.000*
Antioxidants and its significance	87	13	0.70	0.315	19.200	0.001*
Balanced diet and role in oral health	56.7	43.3	0.43	0.504	0.533	0.002*
Micronutrients in respiratory health	90	10	0.50	0.267	16.133	0.003*
Carbohydrates and periodontal diseases	45	55	0.80	0.407	10.800	0.000*
Calcium and magnesium in periodontal health	60	40	0.23	0.430	8.533	0.003*
Do you ever choke while drinking coffee/tea?	76.7	23.3	0.87	0.346	16.133	0.000*
Caffeine in oral health	86.7	13.3	0.13	0.346	16.133	0.001*
Non-vegetarian diet and periodontal health	40	60	0.35	0.630	8.533	0.000*

*statistically significant; **statistically non-significant

Table 2: Response of various questions regarding role of physical activity in oral and respiratory health among studied subjects.

Question	Yes, %	No, %	Mean	Std. Deviation	Chi square	P value
Exercise for facial muscles	77.7	22.3	0.47	0.230	7.533	0.001*
Sitting time and oral health	55	45	0.80	0.407	10.800	0.000*
Sleep duration and oral health	32.7	67.3	0.63	0.404	.833	0.002*
Walking and respiratory health	60	40	0.23	0.430	8.533	0.003*
Exercise over respiratory health	35	85	0.60	0.607	12.800	0.001*
Cycling and acute respiratory illness	38	62	0.63	0.730	11.533	0.000*
Running and oral health	41.8	58.2	0.67	0.246	12.133	0.002*
Running and respiratory health	55.7	44.3	0.23	0.446	15.133	0.000*

*statistically significant; **statistically non-significant

Table 3: Response of various questions regarding oral and systemic health interrelationship among studied subjects.

Question	No, %	Yes, %	Mean	Std. Deviation	Chi square	P value
Oral health related to general health	76.7	23.3	0.77	0.430	8.533	0.003*
Aware of gum problems (gingivitis/periodontitis)	90	10	0.90	0.305	19.200	0.000*
Periodontitis related to heart problem	56.7	43.3	0.43	0.504	0.533	0.002*
Gingivitis with pregnancy	86.7	13.3	0.13	0.346	16.133	0.000*
Poor oral health with diabetes	45	55	0.80	0.407	10.800	0.004*
Medications with gums health	60	40	0.23	0.430	8.533	0.003*
Association with blood sugar level	76.7	23.3	0.87	0.346	16.133	0.000*

*statistically significant; **statistically non-significant

DISCUSSION

Although oral health is an essential part of general health and a precious asset for any individual, still it remains an abandoned entity.[1] Majority of the population have underrated the consequences of awful oral health that further causes more serious problems and becomes difficult to treat.[2] Mostly people are oblivious about the association between oral hygiene and systemic diseases and they remain undiagnosed or untreated as of lack of awareness because their first appearance is usually through oral signs and symptoms. Oral diseases rank among the most significant of human diseases, mainly because of their high frequency of occurrence.[3]

Dental caries afflict humans of all ages and in all regions of the world. These diseases may never be eradicated because of complex interplay of social, behavioral,

collateral, dietary and biological risk factors that are associated with their initiation and progression. A majority of oral diseases exhibit multi factorial etiology. The interplay of host, agent and environmental factors ultimately determine the oral health status of an individual. Dental caries and periodontal disease are two major and most common oral diseases which show widespread distribution among different populations in the world.[4,5] Extensive research of last several decades has shown the crucial role played by dental plaque in the initiation and progression of dental caries and periodontal disease. Dental plaque is considered to be the precursor for both dental caries and periodontal disease and tooth brushing is the most common mechanical method for its removal and control.[6]

Over the past several decades there has been a dramatic change in both the pattern and distribution of oral diseases in developed countries. On one side where it is declining in developed countries; unfortunately, this is not the case of developing countries where there is acute shortage of trained dental manpower, high level of unmet dental needs and a scarcity of economic resources.[7,8] Oral health, although an integral part of general health, is the most neglected one. Lack of awareness, limited access to dentist and underestimation of preventive measures; even among the educated class of the society; has placed India among the most disease prone nations. The oral cavity has a multitude of functions in relation to daily life such as food intake, speech, social contact and appearance. Poor oral health has thus the potential of hampering the quality of life. Decreased food intake because of oral pain or poor dental status can cause low growth in children and may worsen the nutritional status.[9,10] Pain might also have a negative impact on nutritional status and the ability to engage in social relations and children might not get the full benefit of their education if suffering from pain and discomfort. Even though several studies have been carried out to assess the awareness and attitude of people about oral health, but there is still a drought of literature for oral hygiene practices and awareness for periodontal-systemic health relationship region wise. Therefore, the present study was conducted with the aim to assess the awareness level of role of diet and physical activity in oral and periodontal health and their systemic link on patients.[11]

Regarding association of blood sugar levels and for the effect of medication on gingival health, awareness was found to be merely 23.3% and 40% respectively. The results of present study are in agreement with studies done by Kapoor et al and Bhatia et al and concluded that preponderance of the people were unaware about the affiliation between oral hygiene and systemic health or related conditions. The study shows that there is a need to improve the knowledge and oral hygiene practices to prevent the occurrence of oral diseases in order to improvise the standards of awareness amongst the general people.[12-14]

This study has few limitations included time limitation, specific population, study design, and lack of previous study data.

CONCLUSION

Oral health impinges on general well being of the people and that further persuades the health through dietary habits and physical activities. These lifestyle activities are of having paramount importance which helps in prevention and comprehensive management of COPD, asthmatic or periodontal diseases. Even the dietary intake modifications can be considered as adjuvant to the management of periodontal or respiratory illness. Within the limitations of this current study it can be concluded that the majority of the study subjects were having poor knowledge and awareness about the association of periodontal health with systemic conditions. Hence there is scope of improvement regarding the awareness of oral health, oral hygiene and self care principles. Ameliorate of oral health especially periodontal and NIRD can be attributed to proper intense PA with higher intake of healthy nutrition and supplementation of vitamins and minerals. While currently, little evidence exists to support the effect of water-based exercise training on these ailments.

Recommendations

Oral self-care should be acknowledged from childhood, to become an established habit in adulthood. Dental professionals should put an emphasis on oral self-care instructions during each patient's visit and treatment, especially among those with a low socio-economic status. Preventive approaches should be highlighted in continuing education and during dental curriculum revision. Education and training in tobacco use prevention and in cessation skills should be integrated into dental curricula, and into dental continuing education. Tobacco-use prevention and cessation activities should be integrated into the treatment procedures of patients according to international guidelines. National oral health prevention programmes for adults should be introduced, with priority given to those who are underprivileged. Oral health care should be integrated with other health care promotion programmes, employing the common risk factor approach.

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