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Co-Relation Between PUFA Index And Oral Health Related Quality Of Life Among Patients Attending OPD In A Hospital: A Cross Sectional Study.

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Abstract: ***Objective****: Dental caries is a global public health problem. Untreated caries lay a debilitating impact on the work ability, functions and emotional factors of individuals resulting in poor oral health related quality of life. The co relation between PUFA index and oral health related quality of life (OHRQoL) has not been documented so far in India and thereby the need for this study. Aim of the study was to assess the relation between PUFA index (objective) and the self- perceived oral health quality of life (subjective) among the patients attending the OPD in Dental College, Greater Noida, India.* ***Methods****: The PUFA index records the presence of severely decayed teeth and the Severity of OHIP was determined using a self-administered questionnaire comprising of 14 questions. Patients from Out Patient Department of ITS dental college, Greater Noida were recorded using Convenience sampling. SPSS software version 21.0 was used for statistical analysis. Mean and standard deviations were calculated for PUFA and OHIP scores .****Results****: Using the Pearson's co relation coefficient, we found that there was a significant correlation between the OHIP and the PUFA scores. The mean OHIP and PUFA scores of the study subjects were 3.022 and 1.09 respectively. There was a positive correlation between the OHIP score and PUFA score among the study population.* ***Conclusion****: In the present study we concluded that with the PUFA scores increasing; it has a detrimental effect on the oral health related quality of life of the individual.*

Key Words*: PUFA,OIDP,Dental Caries.*

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I. Introduction

Better health is central to human happiness and well-being. It makes an important contribution to economic progress, as healthy populations live longer, are more productive, and save more. **Health** is a dynamic condition resulting from a body's constant adjustment and adaptation in response to stresses and changes in the environment for maintaining an inner equilibrium called homeostasis. According to World Health Organization (WHO), Health is a "State of complete physical, mental, and social well-being and not merely the absence of disease or infirmity to lead a socially productive life." [1]

Oral health is essential to general health and quality of life. It is a state of being free from mouth and facial pain, oral and throat cancer, oral infection and sores, periodontal (gum) disease, tooth decay, tooth loss, and other diseases and disorders that limit an individual's capacity in biting, chewing, smiling, speaking, and psychosocial wellbeing(WHO)[1]. The mouth and face are highly accessible parts of the body, sensitive to and able to reflect changes occurring internally. The mouth is the major portal of entry to the body and is equipped with formidable mechanisms for sensing the environment and defending against toxins or invading pathogens. In the event that the integrity of the oral tissues is compromised, the mouth can become a source of disease or pathological processes affecting other parts of the body.

The most common oral diseases are dental cavities, periodontal (gum) disease, oral cancer, oral infectious diseases, trauma from injuries, and hereditary lesions. Worldwide, 60–90% of school children and nearly 100% of adults have dental cavities, often leading to pain and discomfort. Severe periodontal (gum) disease, which

may result in tooth loss, is found in 15–20% of middle-aged (35-44 years) adults. Dental cavities and periodontal disease are major causes of tooth loss. Complete loss of natural teeth is widespread and particularly affects older people. Globally, about 30% of people aged 65–74 have no natural teeth.[1](WHO)

Dental caries is an infectious microbiologic disease of the calcified tissues of the teeth, characterized by demineralization of the inorganic portion and destruction of the organic substance of the tooth. It is a common chronic disease that leads to pain and disability across all age groups. At the beginning of the 21st century, dental caries is still a serious problem, especially in low- and middle-income countries. The reasons include a high consumption of cariogenic food, the negligence in daily oral health practices and irregular dental check-ups.

Epidemiological study of any disease requires the condition be measured and quantified accurately based on scientific principles to understand the disease. One of the major problems in studying dental diseases is the development of a suitable method for recording the occurrence and severity of disease.[2]

Among several dozen different kinds of criteria for caries detection, only few distinguish the pulpal involvement and dental sepsis. The need for an epidemiological tool for the evaluation of advanced caries stages with pulp exposure or dental sepsis undoubtedly exists. The lack of a proper measurement methodology resulted in very limited data regarding the consequences of untreated caries in the literature. Some studies reported needs for pulp care and for extraction registered by WHO codes for treatment needs, but such data have not often been presented in the literature. A deep carious lesion with pulpal involvement is still considered as "caries in dentin" and the presence of pulpal involvement is not mentioned in the latest edition of the oral health surveys by the WHO.[3]

In 2010, an index of clinical consequences of untreated caries (PUFA) was introduced by Monse et al. The index was developed in a similar way to the decayed missed filled teeth (DMFT) system as a sum of teeth with four different diagnoses[4]

PUFA is an index used to assess the presence of oral conditions resulting from untreated caries. The index is recorded separately from the DMFT/dmft and scores the presence of either a visible pulp, ulceration of the oral mucosa due to root fragments, a fistula or an abscess. Upper case letters for permanent were used for scoring.[5]

Off late, there is a growing concern regarding the impact of the various oral diseases/ disorders on the quality of life of an individual and moreover on the psychosocial impact caused by it. Oral health-related quality of life (OHRQoL) is a multidimensional concept which reflects people's comfort when eating or sleeping, and their satisfaction with respect to their oral health.[6]

One of the frequently used instruments to assess OHRQoL is the Oral health impact profile (OHIP) questionnaire. The (OHIP14) is an instrument which is used to measure people's perception of the social impact of oral disorders on their well-being. This questionnaire aims to capture the impact of oral diseases on everyday well-being and 7 parameters such as functional limitation, physical pain, psychological discomfort, social disability, and handicap are assessed.[7]

The present study aims to investigate the co relation between PUFA scores and OHIP scores among the patients visiting the OPD of Dental College in Greater Noida in India.

Aim and Objectives

Aim

To assess the relation between PUFA index and the self-perceived oral health related quality of life among the patients attending OPD in Dental College,Greater Noida, Uttar Pradesh, India.

Objectives

1. To record the PUFA scores among the study subjects
2. To assess the oral health impact profile scores among the study subjects using OHIP-14 questionnaire
3. To assess the co relation between PUFA and the OHIP scores among the study subjects.
4. To assess the Gender and Age wise co relation with mean PUFA.

II. Materials And Method

A cross sectional study was done among the patients attending outpatient department of a dental college in Greater Noida, Uttar Pradesh, India. The urban- rural variations were not considered and thereby only a sample of patients attending the OPD (convenient sampling) of Dental College Greater Noida was taken into consideration. The target population comprised of individuals aged 19 year to 60 years. Those with any systemic diseases were excluded. The duration of the study was 3 months.

The purpose of the study was explained to each participant and the information was retrieved by using a questionnaire form which assessed both the PUFA and the OHIP scores.
Before starting the study, the training and calibration of the examiner was done.

The assessment is made visually without the use of an instrument. Only one score is assigned per tooth. In case of doubt concerning the extent of odontogenic infection, the basic score (P/p for pulp involvement) is given.[5]

The codes and criteria for PUFA index are as follows:

P: Pulpal involvement is recorded when the opening of the pulp chamber is visible or when the coronal tooth structures have been destroyed by the carious process and only roots or root fragments are left. No probing is performed to diagnose pulpal involvement.
U: Ulceration due to trauma from sharp pieces of tooth is recorded when sharp edges of a dislocated tooth with pulpal involvement or root fragments have caused traumatic ulceration of the surrounding soft tissues, e.g., tongue or buccal mucosa.
F: Fistula is scored when pus releasing sinus tract related to a tooth with pulpal involvement is present.
A: Abscess is scored when a pus containing swelling related to a tooth with pulpal involvement is present.

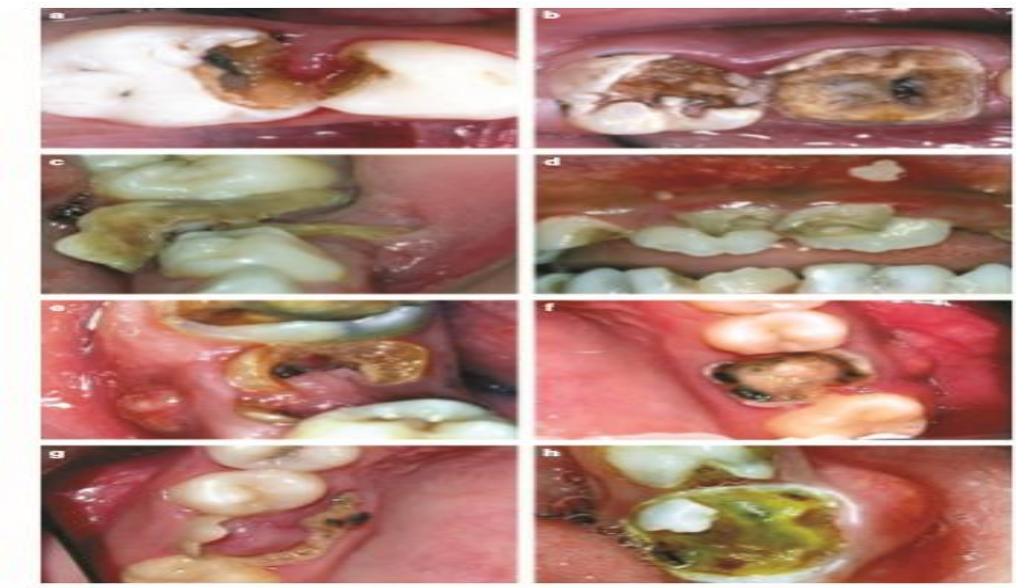

Figure 1

Fig. 1. (a and b) Pulpal involvement (P/p), opening of pulp chamber is visible or coronal tooth structures are destroyed by caries; (c and d) Ulceration (U/u), traumatic ulceration in the soft tissues (tongue and mucosa), caused by tooth or root fragments; (e and f) Fistula (F/f), a sinus tract releasing pus originating from an abscess and opening into the oral cavity; (g and h) Abscess (A/a), dento-alveolar abscess.

The PUFA score per person is calculated in the same cumulative way as for the DMFT and represents the number of teeth that meet the PUFA diagnostic criteria. The PUFA for permanent teeth are reported. Thus, for an individual person the score can range from 0 to 32 PUFA for the permanent dentition.[5] The examiners was trained initially with respect to the PUFA index and calibrated accordingly.

The 'Untreated Caries, PUFA Ratio' is calculated as:

$$\left(\frac{\boldsymbol{PUFA}}{\boldsymbol{D}}\right) * \mathbf{100}$$

The self-perceived oral health i.e. Oral health related quality of life (OHRQoL) was assessed by an oral health impact profile (OHIP14) questionnaire form consisting of 14 questions, which is based on the seven dimensions of the lockers theoretical model of oral health.[7]
All the questions in the OHIP-14 questionnaire form began in the same way: How often have you, as a result of your oral cavity, teeth, jaw or prosthesis, during the past one year, experienced the following situations?

The responses for the 14 questions were categorized according to the 5 point likert scale coded as 0 = never, 1= hardly ever, 2= occasionally, 3 = fairly often, 4= very often.

The questions were organized in seven dimensions: functional limitations, physical pain, psychological discomfort, physical disability, psychological disability, social disability and handicap, each of which contained two questions.

The total score for the OHIP-14 questionnaire (individual) was obtained by adding up the points for the individual questions. The OHIP scores were recorded through verbal interviews and the scoring for each question was marked by the investigators themselves.

Statistical Analysis

All the data were collected and entered into spreadsheets and SPSS software version 21.0 was used for statistical analysis. Mean and standard deviations were calculated for PUFA and OHIP scores. The relation between:

- PUFA and OHIP
- PUFA and Age
- PUFA and Gender

Scores were assessed by employing the Pearson's relation coefficient.

III. Results

Among the patients visiting the dental OPD in dental college of greater Noida 212 patients showed the clinical condition of dental caries were selected on the basis of inclusion criteria. Informed consent was taken from each patient.

Out of 212 subjects there were 94(44.3 %) males and 118(55.6%) females in the study. Table 1 shows the gender wise distribution of the study subjects.

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Table.1. Gender Wise Distribution Of The Study Subjects

GENDER	NUMBER	PERCENTAGE
Male	94	44.3%
Female	118	55.6%

The association between the Gender and the mean PUFA is shown in the [Table2]. There was no statistically significant difference found between the Gender and mean PUFA.

Table.2.Association Between GENDER And Mean PUFA:

Gender	PUFA
MALE	1.09
FEMALE	1.08

P = 0.814

[Table3] indicates that 31.1% of them belonged to the age group (19-34 yrs), 47.6% of them belonged to the age group (35-44yrs) and 21.2% of them belonged to the age group (45-60yrs).

Table.3.Age Wise Distribution Of The Study Subjects:

Age Group	Number
19-34	66(31.1)
35-44	101(47.6)
45-60	45(21.2)

There was no statistically significant co relation (0.921) found between the different age groups and the mean PUFA. For the age group of 18-24 and 35-44 the co relation was 1.06 and for the age group of 25-34 and 45-60 it was found to be 1.09.

Table 4 shows the association between the different age group and the mean PUFA.

Table.4.Association Between Age And Mean PUFA:

Age	PUFA
18-24	1.06
25-34	1.09
35-44	1.06
45-60	1.09

P= 0.921

[Table5] denotes the mean PUFA score of the subjects (1.09) and the mean OHIP score of the study subjects (3.022).

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Table.5.Mean OHIP And PUFA Scores Of The Study Subjects

Total Number Of Subjects	Mean OHIP Scores	Mean PUFA Scores
212	3.022± 1.05	1.09 ± 0.297

A significant co relation was found between PUFA and OHIP. This denotes that with deteriorating oral health condition, it does have an impact on quality of life an individual.

Correlation between OHIP and PUFA Scores

The main objective of this study was to find out if there was any correlation between the OHIP and PUFA scores of the study subjects and using the Pearson' s co relation coefficient, we found that there was a significant correlation between the OHIP and the PUFA scores. **(Pearson's correlation= 0.42)**

IV. Discussion

During the last decade, international caries epidemiology has focused on the development of more sensitive diagnostic criteria to allow for assessment of the initial stages of caries (22, 23). This is considered important in the light of the decline of cavitated caries lesions in high-income countries where non-operative and preventive interventions require an index that distinguishes between the different stages of initial caries lesions.[8]

This study represents possibly the first attempts to explore the correlation between PUFA (consequences of an untreated carious lesions) and OHIP scores of OPD patients of dental college using the OHIP- 14 questionnaire form. However, in a developing country like India, where in a majority of the population has little access to basic oral health care, the concept of identifying incipient carious lesions does not hold ground. Even with the

standard age old DMFT, DMFS index, which calculates the caries experience of the populations, often provides misleading information, as the actual quantification and the consequences of an untreated carious lesion isn't there.[6]

This study had employed the PUFA index to assess the complications of untreated dental caries. However, the DMFT/DMFS index, the untreated caries, PUFA ratio, the prevalence of the P, U, F and A component has not been presented, as the focus of the study was on the co relation between the PUFA and the OHIP scores.

Regarding the instrument used to measure the oral health related quality of life (OHRQoL), the OHIP-14 (oral health impact profile questionnaire) has been used internationally, and its reliability and validity has been well established. The OHIP-14 has a drawback wherein the questionnaire form is self-rated and does not give an option for the subjects to pen down their perceptions.[7]

The mean OHIP score of the present study was 3.022 which is less in comparison to the studies done in other countries.[9]

The mean PUFA value was 0.3 in a study done by Khyati Jain et al in 2014.[10] The data revealed that untreated caries results in pulpal involvement more in permanent dentition.

The reason which may be attributed to this is that the quality of life depends on a number of factors which cannot be accounted for. This sample consisted of a predominantly rural population, wherein the other major health concerns occupy a predominant role in comparison to oral diseases and this fact may be compounded by the low awareness and the socio-economic status of the study subjects, thereby a much lower OHIP score can be justifiable.

A significant co relation was found between the PUFA and the OHIP scores of the study subjects and this denotes that with deteriorating oral health conditions, it does have an impact on the quality of life of an individual. Other studies have also found similar findings between the PUFA scores and quality of life but, the findings of these studies should be cautiously weighed as the study population differs from the current study.[11] The findings of the present study cannot be compared in the Indian scenario as there is a dearth of literature in this aspect.

The ethnic composition of this study population would be difficult to compare with the other major population groups across our country and therefore more studies, targeting a wide geographic area and with different population sub groups is required to validate the results of this study.

V. Conclusion

The mean OHIP and PUFA scores of the study subjects were 3.022 and 1.09 respectively that shows there is a positive correlation between the OHIP score and the PUFA score among the study population. With the PUFA scores increasing, it has a detrimental effect on the oral health related quality of life of the individual.

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