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Original Article

Assessing The Prevalence of Dental Caries Among Chronic Obstructive Pulmonology Disease Patient

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ABSTRACT

Dental caries is one of the most common chronic diseases worldwide and is a complex condition. **Objective:** To assess the prevalence of dental caries in Chronic Obstructive Pulmonology disease patient. **Methods:** A descriptive cross-sectional research study design was used to assess the prevalence of dental caries among COPD. The population was COPD patients. The population is targeted through purposive sampling technique. The tool which was used to assess the prevalence of dental caries among COPD patients was modified, translated and adopted. **Results:** The study results shows that Participants with the age group 30-40 years were 63(36.8%), and with the age group 51-60 were 59(34.5%) majority were male 118(69.0%) and have a history of tooth extraction 100(58.5%), similarly majority have dental crown 125(73.1%) and have Periodontitis which were 103(60.2%). **Conclusions:** The study results showed that to focus on the oral care of the COPD patients because it led toward the further complications and help in the progression of the disease. We have to educate the patient regarding their oral care to prevent complications and dental caries.

INTRODUCTION

It has been demonstrated that respiratory illnesses including pneumonia and chronic obstructive pulmonary disease are significantly influenced by oral health [1]. In the first extensive population studies investigating this relationship [2, 3]. Demonstrated the National Health and Nutrition Examination Survey's (NHANES) data that a COPD diagnosis is correlated with both an oral hygiene index that measures dental plaque and calculus as well as the mean attachment loss of the gingiva from the tooth. Other dental health indicators, such as the probing depth of dental pockets, gingival index, and plaque index, are also linked to the diagnosis of COPD and are based on the forced expiratory volume in 1 second (FEV1), the distance travelled in six minutes, or COPD exacerbations, which measure the severity of the ailment. Improved oral hygiene may reduce negative occurrences involving the lower respiratory system [4-6]. The prevalence of pneumonia was decreased in a cohort of Japanese nursing home patients by frequent dental care. Intubated and mechanically ventilated intensive care unit patients who utilize chlorhexidine swabs see a reduction in the incidence of ventilator-associated pneumonia [7, 8]. Regular tooth scaling and root planning reduced the likelihood of COPD exacerbation in a small, randomized controlled research including 60

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individuals with COPD. Shortness of breath, wheezing, and productive cough are some of the daily respiratory symptoms that characterize COPD, a chronic condition [9, 10]. These symptoms severely reduce quality of life and are brought on by airflow restriction and airway inflammation. Although the factors that prevent COPD patients from receiving proper dental treatment are not fully understood, they may include persistent smoking, lack of dental insurance, or mobility issues brought on by the disease or the use of oxygen [11]. The effect of oral health on the regular respiratory symptoms that COPD patients encounter is uncertain, despite the fact that it is linked to the diagnosis of COPD and several COPD-related health outcomes. In order to test the theory that worse daily respiratory symptoms are correlated with poor dental health, we set out to examine the dental habits and health of a cohort of consecutive COPD patients [12]. A number of systemic illnesses, including COPD, have been linked to periodontal disease and poor dental health. There is a link between periodontal disease and COPD, according an evaluation of 14 observational studies' meta-analysis, however few research has looked at the link Relationship between oral health and COPD flare-ups [13]. In this study, we looked at by contrasting the oral health condition of exacerbates and non-exacerbates, it may be determined if COPD exacerbations are linked to worse oral health [9]. Risk elements for both COPD & periodontal disease include smoking, ageing, and deprivation. Periodontal disease by itself does not cause COPD, according to Prasanna, but it can speed up the illness's progression or exacerbation whenever it is present in combination with other risk factors. This is crucial from the perspective of public health because it suggests that early dental treatment to halt the course of periodontal disease may also benefit lung function [14, 15]. Anti-asthmatic medications have a relatively low pH and can constitute sugar substitutes and hydrolytic enzymes, such as lactose monohydrate, which has been suggested to make asthma patients more vulnerable to the progression of caries [16-18]. Additionally, according to, these drugs alter salivary flow rate, making asthmatics more vulnerable to dental caries. Additionally, people with asthma may drink more acidic beverages, and their tendency to mouth breathe may make them more susceptible to tooth decay [19, 20]. Most asthmatic patients take inhaled medications incorrectly; that is, they administer substantial doses in the oral cavity rather than the upper airways, which may have detrimental consequences on tooth decay [21]. The COPD is ranked as 5th leading cause of death. There are many studies who have worked on the treatment of COPD, educational program on COPD and interventional studies but the complications due to COPD is still under study. Dental caries is one of them. So, the aim of the study was to assess the prevalence of dental caries among COPD patients.

METHODS

The descriptive cross-sectional research study design was used. The study setting was the pulmonology outpatient department of the Jinnah Hospital Lahore. The study was taking approximately nine months. The study targeted population was the Chronic Obstructive Pulmonary Disease patients with dental caries. The study sample is calculated by using Slovin's formula that is 171. Purposive sampling techniques was used to gather information. The patients with COPD diagnosed will be included in the study. Patients with age group 30 to 60 will be included in the study. Patients with any comorbidity other than dental caries with COPD will be excluded in the study. Purposive sampling technique was used in this study. The study sample is calculated by using Slovin's formula.

$n=N/1+Ne^2$

Where, n= sample size (171)

N= population size (300)

e= margin of error (0.05)

n=171.42

SPSS 22.0 was used for data analysis. Mean ± SD was used for quantitative data and frequency percentages for qualitative variables. Descriptive analysis was conducted.

RESULTS

Table 1 show that from total no of participants who respond in this study. Those with the age group 30-40 years were 63(36.8%), similarly those with the age group 41-50 years were 49(28.7%) and those with the age group 51-60 were 59(34.5%).Those who male were 118(69.0%), and similarly female were only 53(31.0%).Those who married were 134(78.4%), those who unmarried were 3(1.8%), those who divorce were 6(3.5%), similarly those who widow were 28(16.4%).Those who illiterate were 62(36.3%), those who have primary education were 27(15.8%), those who have middle pass were 19(11.1%), those who have passed matriculation were 26(15.2%), those who have passed intermediate were 20(11.7%), those who have bachelor were 10(5.8%), similarly those who have high grade qualification were only 7(4.1%). Those who work in private sector were 28(16.4%), those who work in government sector were 24(14.0%),those who have their personal work to do were 81(47.4%),similarly those who work in house were 38(22.2%).Those who have monthly income 15000-25000 were 93(54.4%),those who have monthly income 26000-35000 were 37(21.6%),those who have monthly income 36000-45000 were 20(11.7%), similarly those who have monthly income 46000 or above were 21(12.3%).

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Table 1: Demographic Variables

Variables	Frequency (%)
Age	
30-40	63(36.8)
41-50	49(28.7)
51-60	59(34.5)
Gender	
Male	118(69)
Female	53(31)
Marital status	
Married	134(78.4)
Unmarried	3(1.8)
Divorce	6(3.5)
Widow	28(16.4)
Educational status	
Illiterate	62(36.3)
Primary	27(15.8)
Middle	19(11.1)
Matric	26(15.2)
intermediate	20(11.7)
Bachelor	10(5.8)
Above	7(4.1)
Employment status	
Private	28(16.4)
Government	24(14)
Personal	81(47.4)
Household	38(22.2)
Monthly income	
15000-25000	93(54.4)
26000-35000	37(21.6)
36000-45000	20(11.7)
46000-above	21(12.3)

Table 2 shows that from total participants who respond about the question "Mouthwash use", those who respond yes were 102(59.6%), those who respond no were 69(40.4%), about the question "Dentures", those who respond yes were 55(32.2%), those who respond no were 116(67.8%), about the question "History of tooth abscess", those who respond yes were 70(40.9%), those who respond no were 101(59.1%), about the question "History of tooth Extraction", those who respond yes were 100(58.5%), those who respond no were 71(41.5%),participants who respond about the question "History of Root Canal", those who respond yes were 45(26.3%), those who respond no were 126(73.7%), about the question "dental Crown", those who respond yes were 125(73..1%), those who respond no were 46(26.9%), about the question "Periodontitis", those who respond yes were 103(60.2%), those who respond no were 68(39.8%), about the question "Filling", those who respond yes were 30(17.5%), those who respond no were 141(82.5%).

Table 2: History of Dental Caries

Variables	Frequency (%)
Mouth wash used	
Yes	102(59.6)
No	69(40.4)
Dentures	
Yes	55(32.2)
No	116(67.8)
History of tooth abscess	
Yes	70(40.9)
No	101(59.1)
History of Tooth Extraction	
Yes	100(58.5)
No	71(41.5)
History of Root Canal	
Yes	45(26.3)
No	126(73.7)
Dental Crown	
Yes	125(73.1)
No	46(26.9)
Periodontitis	
Yes	103(60.2)
No	68(39.8)
Filing	
Yes	30(17.5)
No	141(82.5)

DISCUSSION

The descriptive cross sectional research study was assessing the prevalence of dental caries among COPD patients. The study result shows that the total respondents who respond to the study majority were male and majority were within the age group 30-40 and 51-60 and working in both (private and government) setting. The tool used for "prevalence of dental caries among COPD patients" was adopted from [22]. Previous researches by Hobbins *et al.*, and Murtomaa *et al.*, were checking the reliability and validity of tool. So, the tool is considered as reliable and validate. Several previous studies have been conducted to assess the relationship between COPD and clinical markers of periodontal disease and tooth loss [23, 24]. Other authors agree with our finding and have shown that periodontal disease is a significant and independent risk factor of COPD [13]. Descriptive analysis shows that Participants with the age group 30-40 years were 63(36.8%), similarly those with the age group 41-50 years were 49(28.7%) and those with the age group 51-60 were 59(34.5%). Male were 118(69.0%), and similarly female were only 53(31.0%). Participants married were 134(78.4%), those who unmarried were 3(1.8%), those who divorce were 6(3.5%), similarly those who widow were 28(16.4%). From total no of participants who respond in this study illiterate were 62(36.3%), those who have primary education were 27(15.8%), those who have middle pass were 19(11.1%), those who have passed matriculation were 26(15.2%), those who have passed intermediate were 20(11.7%), those who have bachelor were 10(5.8%), similarly those who have high grade qualification were only 7(4.1%). From total no of participants those who work in private sector were 28(16.4%),those who work in government sector were

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24(14.0%),those who have their personal work to do were 81(47.4%), similarly those who work in house were 38(22.2%).those who have monthly income 15000-25000 were 93(54.4%), those who have monthly income 26000-35000 were 37(21.6%),those who have monthly income 36000-45000 were 20(11.7%), similarly those who have monthly income 46000 or above were 21(12.3%). About the question "Mouthwash use", those who respond yes were 102(59.6%), those who respond no were 69(40.4%). About the question "Dentures", those who respond yes were 55(32.2%), those who respond no were 116(67.8%). "History of tooth abscess", those who respond yes were 70(40.9%), those who respond no were 101(59.1%). "History of tooth Extraction", those who respond yes were 100(58.5%), those who respond no were 71(41.5%). "History of Root Canal", those who respond yes were 45(26.3%), those who respond no were 126(73.7%). Those who have "dental Crown" were 125(73.1%), those who don't have "dental crown" were 46(26.9%). "Periodontitis", those who respond yes were 103(60.2%), those who respond no were 68(39.8%). Participants who respond about the question "Filling", those who respond yes were 30(17.5%), and those who respond no were 141(82.5%). The current study finding was consistent with the finding of the study conducted in 2018 by Gaeckle *et al.*, 'Markers of Dental Health Correlate with Daily Respiratory Symptoms in COPD'[22].

CONCLUSIONS

The study results shows that Participants with the age group 30-40 years were 63(36.8%), and with the age group 51-60 were 59(34.5%). Majority were male 118(69.0%) and have a history of extraction 100(58.5%), similarly majority have dental crown 125(73.1%) and have Periodontitis which were 103(60.2%). Most of the participants don't done any oral care due to the fear that our breathing may be stopped and disease can lead toward progression. We need to be focus on the dental care of the COPD patients. We have to educate the patients regarding their oral health because they are already immune-compromise and more prone to get infection through mouth, whenever they eat something. So, that oral care is most important for the COPD patients.

Authors Contribution

Conceptualization: RS
Methodology: HS, RS
Formal Analysis: KU, RS
Writing-review and editing: RS, KU, HS

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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