

Oral Health Status of Workers in Confectionery Factories of Bhopal City: A Comparative Study

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ABSTRACT

Background: Workers in confectionery industries are exposed to the effects of air polluted by sugar dust and consume relatively large amounts of sweets for a number of hours a day, over long periods of time. Exposure to sugar dust may cause dental caries. Studies have reported that confectionery workers have poorer oral health than the other industrial workers.

Materials and methods: Out of 304 confectionery workers they were divided in 152 production line workers and 152 non -production line confectionery workers. Evaluation of statistical significance between groups to be compared was made by independent unpaired t-test and ANOVA for mean values, Post Hoc and chi-square test and Pearson's correlation coefficient for frequencies. Probability value of less than 0.05 was considered statistically significant.

Results: The results are coming statistically significant for the age in relation to the DMFT. In this study the result is not coming statistically significant for the gender in relation to the caries. Significant association was observed between mean DMFT values and vocation type. Higher mean DMFT values were found in production line (3.14) than non-production (1.82).

Conclusion: The Production line workers in the confectionery factories are at higher risk of having dental caries than non-production line workers.

Keywords: Oral health, Confectionery Factories, public dentistry.

INTRODUCTION

Sugar is essential for human body, *Streptococcus mutans* in the plaque also utilizes sugar and produces acids causing dental caries¹. Industrialization has given rise to occupational health problems among the industrial workers². A Confectionery is the set of food items that are rich in sugar, any one or type of which is called a confection³. Workers in these industries are exposed to sugar dust and consume comparatively

big amounts of sweets for a number of hours a day, over long periods of time^{4,5,6,7}. Exposure to sugar dust may cause dental caries⁸. Studies said that confectionery workers have poorer oral health than the other industrial workers. In modern confectionery factory (making cookies, sweets, and bakery products) the caries index was highest on the sweet production line⁴. Work in

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confectionary^{9,10}, candy⁴, bakery¹¹ industries increases the prevalence of dental caries.

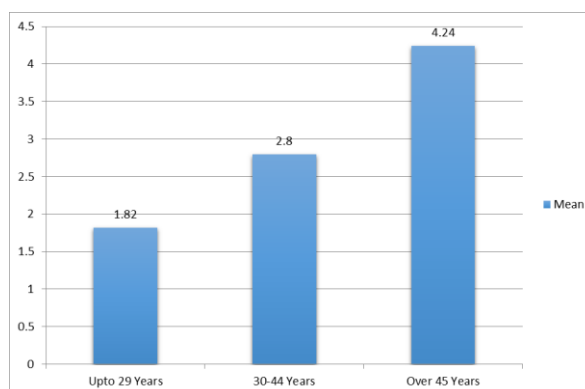
As many studies have proved that airborne sugar dust is an occupational hazard and is responsible for increase in dental caries and poor periodontal health among confectionary factory works, hence an attempt has been made to collect baseline data regarding oral health status and treatment needs among confectionary factory workers in Bhopal city of Madhya Pradesh.

MATERIAL AND METHOD

The aim of the study is to assess the oral health status of workers in confectionery factories and to compare the oral health status of workers involved and not involved in production of sweetened confectionery items in Bhopal city. Study population consisted of confectionery factory employees working in the confectionery factories present in Bhopal city, Madhya Pradesh.

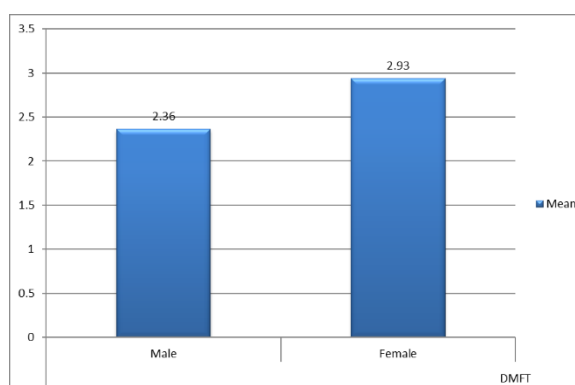
Based on the results of the pilot study, sample size was calculated to be 304. The sample was divided in 152 production line workers and 152 non - production line workers. Production line workers were those workers directly involved in confectionery making and non-production line workers were transportation workers, office workers etc. not directly involved in confectionery making selected by simple random sampling. Employees who were present and willing to participate at the time of study were included in the study. Employees who had severe oral diseases, limited mouth opening, completely edentulous employees and employees undergoing orthodontic treatment were excluded. Evaluation of statistical significance between groups to be compared was made by independent unpaired t-test and ANOVA for mean values, Post Hoc and chi-square test and Pearson's correlation coefficient for frequencies. Probability value of less than 0.05 was considered statistically significant. The data was analysed using SPSS version 20

RESULT



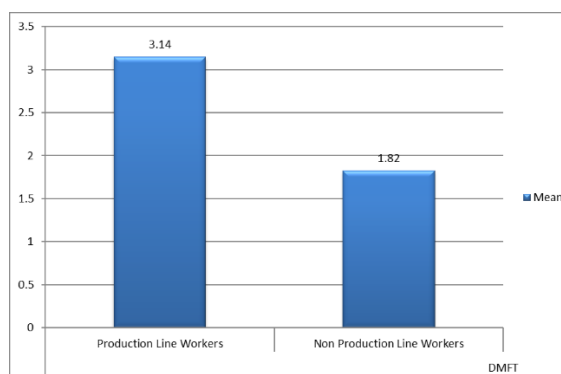
P Value <0.0001

Graph 1: Distribution of Mean DMFT in study subjects according to age.



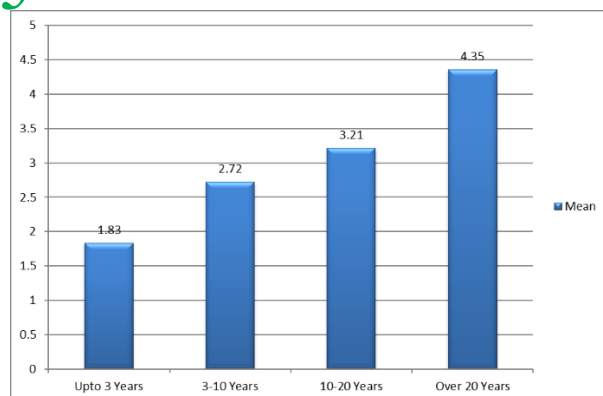
P value = 0.106

Graph 2: Distribution of Mean DMFT in study subjects according to Gender.



P value = <0.0001

Graph 3: Distribution of Mean DMFT in study subjects according to Vocation



P Value = <0.0001

Graph 4: Distribution of Mean DMFT in study subjects according to Duration of Exposure

DISCUSSION

In the present study, the study population consisted of 146(48%) subjects of up to 29 years of age, 125(41.1%) subjects between 30-44 years of age and 33(10.08%) subjects of over 45 years of age. The results are coming statistically significant for the age in relation to the DMFT. In a study by Anaize A.Z.⁹ in 1980 among workers in the sweets industry of Israel, the study subjects among production line workers and for non-production respectively also showing an increase in the mean DMFT with age. In the study done by Akrad TZ¹⁶ in Iran it was found that mean DMFT increases with the age. In a study by Peterson P E¹⁵ in Danish chocolate factory showing increase in the mean DMFS with age. In this study, out of 304 confectionery workers, 240 (78.9%) were the male workers and 64 (21.1%) were female workers and the result is not coming statistically significant for the gender in relation to the caries. 172(71.6%) out of 240 male had caries affected teeth and 52(81.2%) out of 64 female had caries affected teeth showing high prevalence of caries in female workers than male, the mean DMFT is 2.36 ± 2.37 for male and 2.93 ± 3.01 for female but results are not coming statistically significant. In a study by Masalin k¹⁴ in Finnish confectionery factories regarding work related behavioral and dental risk, it was found that the men ate more frequently than the women, and they significantly more frequently ate sugar-containing products. So as in present study the dietary sugar exposure is 32% in 64 of the female workers and 25 % in the 240 male workers showing higher sugar exposure in females which may be the reason for higher DMFT in female workers. In a study by Peterson P

E¹⁵ done in Danish chocolate factory no difference in dental health status was observed between men and women.

The present study also showed statistically significant association between prevalence of dental caries and vocation. Significant association was observed between mean DMFT values and vocation type. Higher mean DMFT values were found in production line (3.14) than non-production (1.82).

Studies by Anaize JZ⁴, Anaize JZ⁹ and Rekha et al¹⁰ in 2002 among confectionary workers of Bangalore city also reported significantly higher mean DMFT values in relation to nature of work or vocation. Also, higher mean DMFT values among production line workers may be due to exposure to sugar dust^{9,10}

The mean DMFT values for duration of exposure of up to 3 years, 3-10 years, 10-20 years and over 20 years were 1.8, 2.72, 3.21 and 4.3 respectively and statistically significant association was observed between mean DMFT values and duration of exposure similar to the studies by Rekha et al¹⁰ and Anaize J.⁹

In this study mean DMFT of production line workers is 3.14 and for non-production line is 1.82 and the overall DMFT is 2.48. In other studies, Akrad TZ¹⁶, Anaize JZ⁹, Masalin KE¹², Masalin K¹³ also has high DMFT in confectionery workers. The DMFS indices of workers on the production lines might have been expected to be higher than those of subjects not engaged in work in an atmosphere containing sugar dust.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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