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Original Article

## Oral Health Status of Brazilian Workers of a Textile Industry

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### Abstract

**Objective:** To evaluate the oral health status of Brazilian workers of a textile industry. **Material and Methods:** A cross-sectional study including 489 individuals of both sexes was performed. Data on gender, age, schooling, frequency of dentist visits and caries experience (DMFT) were collected by a single trained and calibrated examiner. Data were organized using the Statistical Package for Social Sciences (SPSS) software and presented through descriptive and inferential statistics (Poisson Regression Analysis). The significance level was 5%. **Results:** There was predominance of female workers (57.7%) aged 30-39 years (44.6%) and with 9-11 years of schooling (79.7%). Almost all of them had visited the dentist at least once in their lifetime (99.6%), and 66.8% had done so in the last 12 months. The mean DMFT value was 11.14 ( $\pm$  5.64), with higher participation of filled (6.21) and missing components (4.03). There was a statistically significant association between DMFT values ( $\leq$  11 and  $\geq$  12) and age group ( $p < 0.001$ ), as well as between schooling and number of missing ( $p < 0.001$ ) and decayed teeth ( $p < 0.001$ ). **Conclusion:** The mean DMFT of Brazilian workers is high, with a tendency to increase the number of missing teeth as age increases. Schooling was associated with the number of missing and filled teeth.

**Keywords:** Oral Health; Dental Caries; Occupational Health; Textile Industry.

## Introduction

The expansion of industrial activity and the consequent supply of jobs have improved the standard of living and quality of life of people [1]. However, in the light of the rapid economic growth and industrial progress, it is imperative to provide safety and health to workers at the work environment [1], given that technological and industrial progress leads to the development of several new occupational risks [2].

In Brazil, this issue has gained prominence through the National Policy on Workers' Health [3], which reiterates the need for articulation between individual and care actions and the recovery of health problems, with promotion and prevention collective actions, surveillance of environments, work processes and activities and intervention on factors determining the health of workers.

Specifically with regard to dentistry, it is known that diseases and oral dysfunctions have a profound impact on individuals' quality of life [1]. The changes associated with the stomatognathic system can trigger painful stimuli or psychoemotional implications that directly interfere in the performance of daily activities, either by the morbidity caused by the painful symptomatology or by the difficulty of interpersonal relationship that can be caused by the absence of dental elements [4].

Dental problems interfere in the daily activities of workers, and discomfort and pain are the most prevalent, with dental caries being the main triggering factor for this pain symptomatology [5]. Among Indian workers in coal mines, 55.6% had caries experience [6] and in the industrial sector, the occurrence of dental caries is 46.5% [1]. Another study with Brazilian workers in a textile industry showed that orofacial pain had a significant impact on the performance of labor activities (28.5%), with tooth ache affecting 25% of individuals and generating absenteeism in 11.6% of workers [7].

The work environment is therefore a major factor for health determinants [8]. Given the above, and especially considering that oral health is crucial to the general health and well-being of individuals [1,6,8], this study aimed to evaluate the oral health status of Brazilian workers of a textile industry.

## Material and Methods

### Study Design

This is a cross-sectional study conducted in the city of João Pessoa, capital of the state of Paraíba, Brazil, with a population of approximately 801,718 inhabitants and Human Development Index (HDI) of 0.763 [9].

### Sample Selection

The probabilistic sample was composed of 489 workers of both sexes of a textile industry. These workers were attended in 2014 by the Health and Lifestyle Diagnostic Program (DSEV) of the Social Service of Industry (SESI). The Social Service of Industry (SESI) is an institution that

helps create safe and healthy work environments as well as seeks to increase the quality of life of the worker.

### Data Collection

Before clinical examination, the examiner (AFCC) participated in a theoretical and practical training for the use of the DMFT index [10] according to WHO criteria [11]. The following conditions were considered in all examinations per tooth: decayed; filled (with caries and without caries) and missing due to caries.

Data collection occurred between November 2014 and March 2015 by a single calibrated researcher (Kappa = 0.89) and information was recorded on a form. Socio-demographic (sex, age group and schooling) and dental data (time of the last visit to the dentist and caries experience - DMFT) were collected.

### Statistical Analysis

Data were analyzed using the Statistical Package for Social Sciences (SPSS for Windows, version 18.0, SPSS Inc, Chicago, IL, USA). The significance level was 5%.

The bivariate and multivariate Poisson regression analysis with robust variance was used to determine the association between the dependent variable (DMFT dichotomized by the median) and independent variables (sex, age, schooling and time of the last visit to the dentist), after categorization ( $\alpha < 0.05$ ). A backward procedure was used to select the variables that reached p value  $< 0.20$  in the bivariate analysis, as well as variables considered epidemiological determinants. Variables with p value  $< 0.05$  in the adjusted analysis were maintained in the final regression model.

### Ethical Aspects

This study was conducted in compliance with the international ethical guidelines (Declaration of Helsinki) and Resolution 466/12 of the National Health Council that governs researches involving human beings in Brazil, being approved by the Ethics Research Committee of the State University of Paraíba, under protocol No. 36853914.3.0000.5187.

### Results

There was a predominance of female workers (57.7%). The mean age was 33.02 ( $\pm 8.34$ ), with a minimum of 20 years and a maximum of 59 years. Regarding the categorization of age, age groups 20 to 29 and 30 to 39 years had the largest number of individuals (34.7% and 44.6%, respectively). The majority of workers had between 9 and 11 years of schooling (79.7%) (Table 1). Regarding the search for dental services, 66.8% of workers reported having visited the dentist in the last 12 months.

The DMFT analysis revealed an average of 11.14 ( $\pm 5.64$ ), and the average number of decayed teeth was higher in the age group 20-29 years ( $1.19 \pm 0.15$ ), with an increasing trend in the

number of missing and filled teeth was verified with advancing age (Table 2). There was a statistically significant difference between the mean DMFT obtained in each age groups analyzed ( $p < 0.001$ ), as well as for missing ( $p < 0.001$ ) and filled components ( $p < 0.001$ ), as shown in Table 2.

**Table 1. Distribution of workers according to socio-demographic variables (Age group in years, schooling in years of study and last visit to the dentist).**

Variables	Frequency	
	N	%
<b>Sex [489]</b>		
Male	207	42.3
Female	282	57.7
<b>Age group (in years) [489]</b>		
20 to 29	170	34.7
30 to 39	218	44.6
40 to 49	85	17.4
50 to 59	16	3.3
<b>Schooling (in years of study) [489]</b>		
≤ 8	43	8.8
9 - 11	390	79.7
12 -14	56	11.5
<b>Last visit to the dentist [479]</b>		
< 12 months	320	66.8
≥ 12 months	159	33.2

**Table 2. Caries experience according to age group.**

	Age Group (in years)				Total Mean (SD)	P value
	20 to 29 Mean (SD)	30 to 39 Mean (SD)	40 to 49 Mean (SD)	50 to 59 Mean (SD)		
<b>DMF-T</b>	7.69 (0.34)a	11.74 (0.33)b	15.13 (0.55)c	18.50 (1.45)c	11.14 (5.64)	0.001
<b>Decayed</b>	1.19 (0.15)a	0.81 (0.10)a	0.74 (0.13)a	0.56 (0.27)a	0.92 (1.68)	0.187
<b>Missing</b>	1.28 (0.51)a	4.03 (0.27)b	7.69 (0.66)c	13.88 (1.85)d	4.03 (5.01)	0.001
<b>Filled</b>	5.23 (0.28)a	6.87 (0.26)b	6.89 (0.45)b	4.06 (0.90)a	6.21 (3.99)	0.001

The mean DMFT values (SD) and its components are analyzed according to age groups (Kruskal-Wallis test with  $\alpha = 0.05$ ). Same lowercase letters indicate that there is no statistically significant difference among age groups (Mann-Whitney test with 6 penalties,  $\alpha = 0.05$ ).

The bivariate analysis between schooling and DMFT components showed a statistically significant difference between education and decayed teeth ( $p < 0.001$ ) and missing teeth ( $p = 0.004$ ), with no significant difference between schooling and filled teeth ( $p = 0.068$ ).

Table 3 shows the values obtained in the association tests between DMFT value dichotomized by the median and independent variables (sex, age group, schooling and last visit to the dentist). In the bivariate analysis, variables age and schooling were associated with the DMFT value, showing that DMFT increased with age and decreased with schooling ( $p < 0.05$ ). These variables, added by sex and last visit to the dentist, were incorporated into the multivariate regression model ( $p < 0.20$ ). Worker's age remained in the final Poisson regression model for DMFT

dichotomized by the median, showing that the age groups 20-29 years (PR = 0.659, 95% CI = 0.58-0.74) and 30 - 39 years (PR = 0.833; 95% CI = 0.74-0.93) were protective factors for the presence of DMFT greater than 11 (Table 3).

**Table 3. Distribution of workers in the bivariate and multivariate Poisson Regression models for DMFT dichotomized by the median and independent variables.**

Variables	DMF-T		p-value	Bivariate Not adjusted RP* (CI 95%)	p-value	Multivariate Adjusted RP † (CI 95%)
	< 11 n (%)	> 11 n (%)				
<b>Sex</b>						
Male	123 (59.4)	84 (40.6)	0.093	0.948 (0.892-1.009)	-	-
Female	146 (51.8)	136 (48.2)		1.00	-	-
<b>Age Group (in years)</b>						
20 - 29	137 (80.6)	33 (19.4)	0.000	0.659 (0.586-0.740)	0.000	0.674 (0.594-0.765)
30 - 39	107 (49.0)	111 (51.0)	0.002	0.833 (0.743-0.933)	0.007	0.845 (0.748-0.955)
40 - 49	22 (25.9)	63 (74.1)	0.506	0.961 (0.853-1.081)	0.647	0.971 (0.858-1.100)
50 - 59	03 (18.8)	13 (81.2)		1.00	-	1.00
<b>Schooling (in years of study)</b>						
≤ 8	15 (34.9)	28 (65.1)	0.014	1.170 (1.032-1.327)	-	-
9 - 11	221 (56.7)	169 (43.3)	0.749	1.016 (0.922-1.120)	-	-
12 -14	33 (58.9)	23 (41.1)		1.00	-	-
<b>Last Visit to the Dentist</b>						
< 1 year	182 (56.8)	138 (43.1)	0.134	0.952 (0.893-1.015)	-	-
≥ 1 year	79 (49.7)	80 (50.3)		1.00	-	-

\*Poisson regression not adjusted for independent variables and the DMFT value dichotomized by the median ( $\alpha < 0.05$ ). † Poisson multivariate regression with robust variance adjusted for the DMFT value dichotomized by the median and sex, age, schooling and last visit to the dentist (independent variables) by the backward procedure ( $\alpha < 0.05$ ).

## Discussion

Oral health, as an integral part of general health, is characterized as a valuable resource for anyone [6,12], especially for those who represent the workforce of large industries. Therefore, poor oral health status has been increasingly verified as having an important negative impact on the daily performance and quality of life of individuals of both sexes [5,13,14]. The oral health indicator that has been described as the most negatively influencing quality of life is tooth loss, which may be associated with advancing age [14].

Thus, epidemiological surveys aimed at assessing the working population have shown predominance of male workers [8,12,15], opposing to data obtained in this study that found a greater number of women. It is assumed that such divergence occurred as a consequence of the insertion of these workers into a textile industry in which individuals perform cutting and sewing activities, which is culturally designated to females. To confirm this assertion, Brazilian researchers have found predominance of women among workers in the textile industry [7].

In this study, it was found that the majority of workers had up to 11 years of schooling, corroborating previous findings [8]. In addition to the fact that education is related to the actions of people as citizens, it also influences their income, which becomes an agent of great influence on individuals' lives [16]. Health education can provide the cognitive and affective resources to individuals so that they can achieve better health [17].

In several regions of Brazil, pain of dental origin is a public health problem [18] and this occurrence significantly interferes with the daily performance of workers [7]. Therefore, the use of dental services, especially those of preventive nature, is extremely important for workers [15]. In this study, almost all individuals had used such services (99.6%), and of them, two thirds had already sought preventive and / or curative care for less than one year.

Preventive dental treatment tends to reduce discomfort and absenteeism [15], since individuals who have comfortable, functional dentition with appearance that allows them to perform their social role and daily activities, will better perform their functions [5], resulting in benefits for both company and worker, since pain causes daily suffering and limitations, negatively impacting the well-being of individuals [7].

The researched industry, in a partnership with the Social Service of Industry (SESI), provides dental care (preventive and curative) to workers at the company's headquarters. Access to oral care tends to minimize episodes of pain [19], without prejudice to work activities [18]. In addition, individuals with irregular patterns of visits to the dental service or those who only seek care due to urgency are more likely to stay away from their duties or will work with pain, maximizing the risk of work-related accidents due to lack of concentration [18]. Thus, knowing the oral health status of a working class favors the elaboration / maintenance of policies and programs aimed at their needs, thus avoiding the occurrence of absenteeism and increasing productivity.

In the case of the DMFT index, when comparing the findings of this research with the results of the last national survey conducted in Brazil [20], it was observed that for the city of João Pessoa, Brazil, in the year of 2010, the mean DMFT index for the age group of 35-44 years was 17.61, whereas in this study, the mean values observed for age groups of 30-39 years (DMFT = 10.28) and 40-49 years (DMFT = 12.22) showed markedly lower values. This fact may be related to the access of the population studied to promotion, prevention and rehabilitation services offered by the company.

The mean DMFT increased with advancing age. In the analysis of its components, the number of decayed teeth decreased among older workers; however, there was an increase in the number of missing teeth, as observed among Indian workers [21] and Brazilian adults [22]. Therefore, workers who visit the dentist more frequently have fewer missing teeth [21].

A statistically significant difference between schooling and decayed and missing components of the DMFT index was also found. Schooling is a variable that has shown association with oral health standard and the use of dental services [18]. Educational frailty can interfere with the importance given to health self-perception. The lack of perception of one's own needs is one of the factors that may be involved in the low utilization of dental service [18, 22].

Caries is one of the main causes of tooth loss [22,23], which is one of the worst types of oral health damage, resulting in aesthetic and functional limitations. However, both the loss of dental elements and the presence of caries have a dramatic impact on workers' quality of life [24]. Thus,



like medical care is one of the priorities among factory workers to maintain the high standard of working hours and reduce absenteeism [1], oral health also needs attention.

Considering that the working environment influences the health status of workers [12], attention should be paid to the need to incorporate oral health check-ups into regular general health check-ups of industry workers, since pain has an important impact on the quality of life of these workers, due to both suffering and limitations in daily life activities [15]. In addition, encouraging such workers to visit the dentist at least twice a year will help identifying those susceptible in due time and reduce the burden of oral disease on this part of the population [2].

Oral health promotion programs should be planned taking into account the most prevalent treatment needs and priority of people [8]. In this sense, epidemiological surveys are necessary tools to carry out strategies in a more resolute way, being able to plan oriented actions based on true scenarios and thus obtains a working class with good oral health and quality of life.

## Conclusion

The DMFT index of Brazilian workers in the textile industry is high, with mean number of decayed teeth being higher in young adults, with a tendency to increase the number of missing teeth as age increases. Schooling was associated with the number of missing and filled teeth.

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