

ORIGINAL RESEARCH

Oral Health Status and Treatment Needs among Handicraft Factory Workers in Jaipur City, Rajasthan

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ABSTRACT

Background: India is one of the largest suppliers of handicraft to the world market and is highly labor-intensive, cottage-based, and decentralized, being spread all over the country in rural and urban areas.

Objectives: The study was conducted to assess dental caries and periodontal status among handicraft factory workers and to assess their relation with age, education, income, and working experience.

Materials and methods: A cross-sectional study was conducted among 138 handicraft factory workers in Rajasthan State Industrial Development and Investment Cooperation (RIICO) area, Jaipur, India. Information about the demographic details, oral habits, oral health status, and treatment needs were collected using modified World Health Organization (WHO) proforma 1997. Chi-square test was used for categorical variables. $p \leq 0.05$ was taken as significant.

Results: Among 138 samples, 39.9% of the factory workers had periodontal pocket. Mean decayed–missing–filled teeth (DMFT) was found to be 0.9203. Associations between age, gender, education, and working experience were found to be significant with community periodontal index, periodontal loss of attachment, and DMFT ($p \leq 0.05$).

Conclusion: The oral health of handicraft factory workers is in poor state. Primary oral health care programs like dental screening, oral health education, and treatment at regular intervals should be carried out that will help to serve the underserved population and fulfill the oral health care needs of the handicraft factory workers.

Keywords: Dental caries, Factory workers, Handicraft, Oral health, Periodontal disease.

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INTRODUCTION

Health is defined as a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity.¹ Oral health is a state of being free from chronic mouth or facial pain, oral or throat cancer, oral sores, congenital defects, such as cleft lip and palate, periodontal disease, tooth decay and tooth loss, and other diseases or disorders that affect the oral cavity.² Oral diseases and dysfunctional conditions of oral cavity have an intense effect on the quality of life throughout an individual's life cycle.³ Several factors affect the oral health that involves environmental and occupational factors. When the equilibrium between the environment and human gets disturbed, it leads to a state known as disease.²

There has been the pattern of marked changes in oral disease around the globe in the last decade. Oral health report of the studies carried out over last 40 years revealed contrasting disease tendency, depending upon country people and socioeconomic condition.⁴

Occupational hazard can be defined as an unpleasant health risk to a person usually arising out of employment. It refers to work, material, matter, procedure, or situation causes accidents, or disease at work place.¹ Occupational hazards contribute to the early death of millions of people worldwide and also result in ill health and disablement of millions of people each year. The World Health Organization (WHO) places occupational risks as one of the leading cause of morbidity and mortality.⁵

People employed in various industries are exposed to hazardous environment. This acquaintance worsens the oral and general health of people working in industries for long hours. Every occupation is related with one or other ill effects on health. Studies have shown the association between occupational exposure and greater incidence of oral diseases.^{6,7-9}

Ramazzini, "the father of industrial hygiene," was the first to advocate the inclusion of patient's occupation in medical history and pointed out a number of oral symptoms as injurious effects of occupational hazards in jaw bones, teeth, periodontal tissues, tongue, lips, and oral mucosa and presented also the evidence.¹⁰ Exposure to physical, chemical, and biological agents at the work place results in adverse effects on workers, ranging from simple distress and irascibility to debilitating occupational disease.¹¹

Although exports of handicrafts appear to be generous, India's contribution in world imports is minuscule. It is a sector, i.e., still not completely explored from the point of view of concealed potential areas. India, a country with 29 states, 7 union territories, 18 languages and more than 1,500 dialects, offers a massive range of handicrafts from each of the states.

A majority of studies on factory employees were piloted abroad, with very few studies from Asia. Until now, to the best of authors' knowledge, there are no reports regarding the oral health status of handicraft factory workers in Jaipur city, Rajasthan. Hence, this study was carried out with the aim to assess the oral health status and treatment needs of handicraft factory workers in Rajasthan State Industrial Development and Investment Cooperation (RIICO) industrial area of Jaipur city, Rajasthan and to evaluate the associations between dental caries status, periodontal disease, and traumatic dental injury with age, education, income, and working experience among the handicraft factory workers.

MATERIALS AND METHODS

Data Collection

A cross-sectional study was conducted to assess oral health status and treatment needs among handicraft factory workers in RIICO area, Jaipur city, Rajasthan. Permission for conducting the study was obtained from Chief Executive Officer of the respective factories telephonically or personally and verbal consent was taken from the workers.

Sample Size and Sampling Technique

Sample size was calculated at 95% confidence level, assuming 90% prevalence of periodontal diseases. At the absolute allowable error (precision) of 5% minimum, 138 factory workers are required as sample size.

To select these workers it was decided to procure complete list with number of employees from all handicraft factories of RIICO industrial area, Jaipur. Out of these, one factory was selected by simple random sampling technique and all eligible factory workers fulfilling our inclusive criteria were included in the study. Information about demographic details, oral habits, and data on oral health status and treatment needs were collected using modified WHO proforma (1997). The examination was carried out using mouth mirror, explorer, and Community Peridontal Index (CPI) probe.

Inclusion Criteria

- Handicraft factory workers who were present at the time of study

- Handicraft factory workers willing to participate in the study.

Exclusion Criteria

- Handicraft factory workers who were not able to communicate or cooperate
- Handicraft factory workers who were suffering from any systemic diseases.

Statistical Analysis

Continuous variables were summarized as mean and standard deviation while nominal/categorical variables as percentages. Descriptive frequency and chi-square tests were used for all statistical analysis. p -value < 0.05 was taken as significant. Statistical Package for the Social Sciences (SPSS) version 20 software was used for all statistical calculations.

RESULTS

A cross-sectional descriptive study was carried out among 138 handicraft factory employees, out of whom 84.1% (116) were males and 15.9% (22) were females of 18 to 49 years of age. Socioeconomic status was measured using modified Kuppuswamy's scale (2014), which revealed that the majority of employees belonged to lower socioeconomic class.¹² Educational qualification revealed that 50% (69) of employees were illiterate. Thirty-three (23.9%) employees were working in the same factory for more than 5 years.

Table 1 depicts the association between community periodontal index with various socioeconomic variables, adverse oral habits, and working experience. Fifty-five employees (39.9%) had pocket of 4 to 5 mm. Among them, 27 employees were illiterate and 30 employees belonged to 31 to 40 years of age group. Thirty-three factory workers were not using any of the tobacco products and out of those, 18 workers had calculus. A significant association was observed between periodontal status (CPI) and gender ($p=0.00$), age ($p=0.00$), tobacco use ($p=0.00$), and working experience ($p=0.00$). Whereas, no significant association was observed with education ($p=0.88$) and income ($p=0.775$).

Table 2 shows the association between periodontal status [loss of attachment (LOA)] with various socioeconomic variables, adverse habits, and working experience. Seventy-seven employees (55.8%) had no LOA; among them, 50.65% (39) employees were of 21 to 30 years of age, 48.05% (37) employees were illiterate, and 36.36% (28) employees had no adverse oral habit of tobacco or alcohol. Significant association was observed between LOA and gender ($p=0.017$), age ($p=0.003$), tobacco use ($p=0.011$), and working experience ($p=0.00$), while no

Table 1: Association between community periodontal index with various socioeconomic variables, adverse habits, and working experience

Variables	Healthy	Bleeding on probing	Calculus	Pocket (4–5 mm)	Pocket (≥6 mm)	Total (n = 138)	χ^2 -value	p-value
<i>Age group (years)</i>								
15–20	0	1	0	0	1	2		
21–30	0	6	31	13	1	51	40.744	0.001*
31–40	1	3	18	30	9	61		
41–50	0	0	4	12	8	24		
<i>Gender</i>								
Male	0	5	42	52	17	116	20	0.00*
Female	1	5	11	3	2	22		
<i>Education</i>								
Illiterate	1	7	23	27	11	69		
Primary school certificate	0	3	16	14	3	36		
Middle school certificate	0	0	5	7	1	13	13	0.88
High school certificate	0	0	7	3	4	14		
Intermediate or post high school	0	0	1	2	0	3		
Graduate or postgraduate	0	0	1	2	0	3		
<i>Income (INR)</i>								
≤1,802	0	0	0	0	1	1		
1,803–5,386	1	7	37	36	9	90		
5,387–8,988	0	3	13	15	7	38	12	0.775
8,989–13,494	0	0	3	3	2	8		
≥36,017	0	0	0	1	0	1		
<i>Tobacco use</i>								
Chewing tobacco	0	1	7	12	3	23		
Smoking tobacco	0	0	8	4	0	12		
Chewing with smoking	0	0	9	13	4	26	56.299	0.00*
Chewing with alcohol	0	0	5	4	0	9		
Smoking and alcohol	0	2	1	2	0	5		
Chewing, smoking, and alcohol	0	0	5	15	10	30		
None	1	7	18	5	2	33		
<i>Working experience in factory</i>								
<6 months	0	1	5	2	0	8		
6 months–1 year	0	5	4	3	0	12		
1–2 years	1	2	17	8	1	29	62.376	0.00*
2–3 years	0	1	10	12	2	25		
3–4 years	0	1	7	7	1	16		
4–5 years	0	0	4	9	2	15		
>5 years	0	0	6	14	13	33		

Test applied: Chi-square, *Significant ($p \leq 0.05$)**Table 2:** Association between LOA with various socioeconomic variables, adverse habits, and working experience

Variables	Healthy	0–3 mm	4–5 mm	6–8 mm	Total (n = 138)	χ^2 -value	p-value
<i>Age group (years)</i>							
15–20	1	1	0	0	2		
21–30	39	12	0	0	51	25.297	0.003*
31–40	31	25	5	0	61		
41–50	6	13	4	1	24		
<i>Gender</i>							
Male	58	49	8	1	116	10.228	0.017*
Female	19	2	1	0	22		
<i>Education</i>							
Illiterate	37	26	5	1	69		
Primary school certificate	21	14	1	0	36	5	0.99
Middle school certificate	8	4	1	0	13		

(Contd...)

(Contd...)

Variables	Healthy	0–3 mm	4–5 mm	6–8 mm	Total (n = 138)	χ^2 -value	p-value
High school certificate	8	4	2	0	14		
Intermediate or post high school	2	1	0	0	3		
Graduate or postgraduate	1	2	0	0	3		
Income (INR)							
≤1,802	0	1	0	0	1		
1,803–5,386	52	34	3	1	90	8.766	0.723
5,387–8,988	21	12	5	0	38		
8,989–13,494	4	3	1	0	8		
≥36,017	0	1	0	0	1		
Tobacco use							
Chewing tobacco	12	10	1	0	23		
Smoking tobacco	8	4	0	0	12		
Chewing with smoking	12	12	1	1	26		
Chewing with alcohol	6	3	0	0	9	34.562	0.011*
Smoking and alcohol	3	2	0	0	5		
Chewing, smoking, and alcohol	8	16	6	0	30		
None	28	4	1	0	33		
Working experience in factory							
<6 months	7	1	0	0	8		
6 months–1 year	11	1	0	0	12		
1–2 years	20	9	0	0	29	46.809	0.000*
2–3 years	16	9	0	0	25		
3–4 years	10	5	1	0	16		
4–5 years	5	10	0	0	15		
>5 years	8	16	8	1	33		

Test applied: Chi-square, *Significant ($p \leq 0.05$)

significant association was found with education ($p=0.99$) and income ($p=0.723$). None of the factory worker had LOA more than 8 mm.

Table 3 shows the association between decayed–missing–filled teeth (DMFT) with various socioeconomic variables, adverse habits, and working experience. Seventy-six employees (55.07%) had no DMFT whereas only 1 employee had 7 DMFT, who belonged to illiterate group. Majority of the employees (61) belonged to 31 to 40 years of age. Sixty-nine employees were from illiterate group and 90 employees had per-capita income of 1,803–5,386 per month, out of which 52 had no DMFT. Highest DMFT score was found in employees who had habit of chewing as well as smoking tobacco and drinking alcohol. Highest number employees (9) had 1 DMFT and were working for 1 to 2 years in that factory and had a mean DMFT value of 0.9203. Association of dental caries was found to be significant only with age ($p=0.041$) whereas no significant association was obtained with other variables like gender ($p=0.803$), education ($p=0.912$), income ($p=1.000$), and working experience ($p=0.519$).

DISCUSSION

The present study was conducted to evaluate the oral health status and treatment needs of handicraft factory

workers and to assess the association of dental caries, periodontal status, and traumatic dental injury with age, education, income, and working experience among the handicraft factory workers.

In the present study, it was found that 33 employees did not use tobacco in any form and 105 employees used tobacco in the form of chewing or smoking and drank alcohol. The result obtained in this study is in contrary to the study conducted by Ahmad et al,¹³ who reported high prevalence of use of tobacco by the factory employees. These results are also in contrary with the findings of previous studies.^{11,14-17}

It was found that among 138 employees, 124 were using toothbrush with toothpaste for maintaining their oral hygiene and only one employee was using indigenous methods. This finding is strongly in contradiction to a study conducted by Solanki et al¹⁴ in which he found that no worker used a toothbrush and toothpaste to clean their teeth.

A maximum of 3 decayed, 7 missing, and 2 filled teeth components were found in the present study, so the frequency of decayed tooth and average DMFT index was very less in the present study than that reported by Bachanek et al¹⁸ Mean number of missing teeth due to caries was more in older age group, which was same

Table 3: Association between DMF teeth with various socioeconomic variables, adverse habits, and working experience

Variables	0	1.00	2.00	3.00	4.00	5.00	6.00	7.00	Total (n = 138)	χ^2 -value	p-value
<i>Age group (years)</i>											
15–20	2	0	0	0	0	0	0	0	2	33.455	0.041*
21–30	31	12	6	2	0	0	0	0	51		
31–40	32	14	10	3	2	0	0	0	61		
41–50	11	2	3	3	0	2	2	1	24		
<i>Gender</i>											
Male	64	22	17	7	1	2	2	1	116	4	0.803
Female	12	6	2	1	1	0	0	0	22		
<i>Education</i>											
Illiterate	41	14	6	3	1	1	2	1	69	24	0.912
Primary school certificate	21	5	7	2	0	1	0	0	36		
Middle school certificate	6	3	2	2	0	0	0	0	13		
High school certificate	7	4	1	1	1	0	0	0	14		
Intermediate or post high school	0	1	2	0	0	0	0	0	3		
Graduate or postgraduate	1	1	1	0	0	0	0	0	3		
<i>Income (INR)</i>											
≤1,802	1	0	0	0	0	0	0	0	1	7.937	1.000
1,803–5,386	52	16	12	5	1	1	2	1	90		
5,387–8,988	17	11	6	2	1	1	0	0	38		
8,989–13,494	5	1	1	1	0	0	0	0	8		
≥36,017	1	0	0	0	0	0	0	0	1		
<i>Tobacco use</i>											
Chewing tobacco	17	4	2	0	0	0	0	0	23	34.654	0.782
Smoking tobacco	5	5	1	1	0	0	0	0	12		
Chewing with smoking	13	7	3	2	0	0	1	0	26		
Chewing with alcohol	6	0	3	0	0	0	0	0	9		
Smoking and alcohol	3	0	1	1	0	0	0	0	5		
Chewing, smoking, and alcohol	14	4	4	3	1	2	1	1	30		
None	18	8	5	1	1	0	0	0	33		
<i>Working experience in factory</i>											
<6 months	5	3	0	0	0	0	0	0	8	40.902	0.519
6 months–1 year	8	2	2	0	0	0	0	0	12		
1–2 years	16	9	3	1	0	0	0	0	29		
2–3 years	16	3	3	2	1	0	0	0	25		
3–4 years	9	3	4	0	0	0	0	0	16		
4–5 years	8	1	5	0	0	0	1	0	15		
>5 years	14	7	2	5	1	2	1	1	33		

Test applied: Chi-square, *Significant (p≤0.05)

as reported by Petersen and Tanase.¹⁹ Percentage of subjects that were caries free was very high than testified by Duraiswamy et al²⁰ For all the age groups, untreated dental caries constituted most of the caries and experience shows unavailability of formal dental care; analogous condition was observed in a study done by Petersen PE.²¹

The prevalence of periodontal pocket of 4 to 5 mm among the handicraft factory employees was highest among the employees of age group between 31 and 40 years of age. This finding is in correlation with the findings of the study conducted by Solanki et al²² in which he found the incidence of periodontal pockets up to 4 to 5 mm in nonsmokers, whereas pockets equal to or more

than 6 mm were found more in smokers. Maximum of the study sample (77) were having healthy periodontium with no LOA and this was seen highest among the employees of 21 to 30 years of age. So, regarding the periodontal status of the subjects, higher percentages of subjects in this study were having signs of periodontal disease which was same as that reported by Srikandi and Clarke.²³ Teeth with probing depths greater than 4 mm increased with the increase in age in this study and it was also the same as that reported by Lie et al.²⁴ The most prevalent treatment need in the current study was oral prophylaxis, which was the same as reported by Roman and Pop.²⁵ Periodontal status of the subjects was significantly associated with socioeconomic status and lack of awareness.

CONCLUSION

Primary oral health care programs like dental screening, oral health education, and treatment along with continuous professional research at regular intervals should be strictly carried out among handicraft factory employees that will help to serve the underserved population of any state or country. Also, their status can be realized and needs could be fulfilled as this is the population that act as a vital system of a nation, and a healthy environment and individual will lead to a healthy as well as productive labor population for sound and rapid development of any nation.

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REFERENCES

1. Park K. Textbook of preventive and social medicine. 20th ed. Jabalpur (MP): Banarsidas Bhanot Publishers; 2009. p. 13.
2. Sharma A, Thomas S, Dagli RJ, Solanki J, Arora G, Singh A. Oral health status of cement factory workers, Sirohi, Rajasthan. *JHRR* 2015;1(1):15-19.
3. Vanishree N, Sequeira PS, Rao A, Gupta N, Chandrashekhar BS, Mohan ANJ. Oral health status and treatment needs of female beedi factory workers in Mangalore city, India. *Al Ameen J Med Sci* 2014;7(1):26-33.
4. Bansal M, Veerasha KL. Oral health status and treatment needs among factory employees in Baddi-Barotiwal-Nalagarh Industrial hub, Himachal Pradesh, India. *Ind J Oral Sci* 2013;4(3):105-109.
5. World Health Statistics 2013. Geneva: WHO Publications; 2013.
6. Schour I, Sarnat BG. Oral manifestations of occupational origin. *J Am Med Assoc* 1942;120(15):1197-1207.
7. Shizukuishi S, Hayashi N, Tamagawa H, Hanioka T, Maruyama S, Takeshita T, Morimoto K. Life style and periodontal health status of Japanese Factory workers. *Ann Periodontol* 1998 Jul;3(1):303-311.
8. Sanadhya S, Ramesh N, Sharda A, Asawa K, Tak M, Batra M, Daryani H. The oral health status and the treatment needs of salt workers at Sambhar Lake, Jaipur, India. *J Clin Diagn Res* 2013 Aug;7(8):1782-1786.
9. Ramesh N, Sudhanshu S, Sharda AJ, Asawa K, Tak M, Batra M, Daryani H, Ramesh G. Assessment of the periodontal status among Kota stone workers in Jhalawar, India. *J Clin Diagn Res* 2013 Jul;7(7):1498-1503.
10. Peterson PE, Henmer P. Oral conditions among workers in the Danish granite factory workers. *Scand J Work Environ Health* 1988;14:328-331.
11. Dagli RJ, Santhosh K, Dhanni C, Prabu Duraiswamy P, Kulkarni S. Dental health among green marble mine labourers, India. *J Oral Health Comm Dent* 2008;2(1):1-7.
12. Gururaj, Maheshwaran. Kuppuswamy's socioeconomic status scale – a revision of income parameter for 2014. *Int J Recent Trends Sci Technol* 2014;11(1):1-2.
13. Ahmad MS, Mamun AA, Islam MS, Rubby MG, Alam MM. Oral health status among the tobacco workers in Rangpur, Bangladesh. *RDCH* 2014;12(1):13-16.
14. Solanki J, Gupta S, Chand S. Oral health of stone mine workers of Jodhpur City, Rajasthan, India. *Saf Health Work* 2014 Sep;5(3):136-139.
15. Boyle P, Macfarlane GJ, Maisonneuve P. Epidemiology of mouth cancer in 1989: a review. *J R Soc Med* 1990 Nov;83(3):724-730.
16. McLaughlin JK, Gridley G, Block G. Dietary factors in oral and pharyngeal cancer. *J Natl Cancer Inst* 1988 Oct 5;80(15):1237-1243.
17. Scully C. Oncogenes, tumor suppressors and viruses in oral squamous cell carcinoma. *J Oral Pathol Med* 1993 Sep;22(8):337-347.
18. Bachanek T, Pawłowicz A, Tarczydło B, Chalas R. Evaluation of dental health in mill workers. Part I. The state of dentition. *Ann Agric Environ Med* 2001;8(1):103-105.
19. Petersen PE, Tanase M. Oral health status of an industrial population in Romania. *Int Dent J* 1997 Aug;47(4):194-198.
20. Duraiswamy P, Kumar TS, Dagli RJ, Chandrakant, Kulkarni S. Dental caries experience and treatment needs of green marble mine laborers in Udaipur district, Rajasthan, India. *Indian J Dent Res* 2008 Oct-Nov;19(4):331-334.
21. Petersen PE, Razanamihaja N. Oral health status of children and adults in Madagascar. *Int Dent J* 1996 Feb;46(1):41-47.
22. Solanki J, Dundappa J, Gupta S, Aneja P, Gupta A. Comparative evaluation of prevalence of periodontal disease in smokers and non-smokers in factory workers of Jodhpur, Rajasthan. *Indian J Contemp Dent* 2013;1(2):29-33.
23. Srikandi TW, Clarke NG. Periodontal status in a South Australian industrial population. *Community Dent Oral Epidemiol* 1982;10:272-275.
24. Lie T, Due NA, Abrahamsen B, Bøe OE. Periodontal health in a group of industrial employees. *Community Dent Oral Epidemiol* 1988 Feb;16(1):42-46.
25. Roman A, Pop A. Community periodontal index and treatment needs values (CPITN) in a factory worker group in Cluj-Napoca, Romania. *Int Dent J* 1998 Apr;48(2):123-125.