OriGiNAl reSeArCh

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Manufacturing Workers at Metagalli, Mysore, Karnataka

Oral Health Status and Treatment Needs of Jeep Battery
sites including oral cavity.2 deafness, organ damage, oral diseases and cancers of various
occupational diseases such as lung fibrosis, neuropathy,
ranging from simple discomfort and irritation to debilitating
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interaction of the individual
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health of working population.1 The interaction of man and his environment.1 “Occupational environment”
exclusion criteria
examination were included in the survey.

Results: Among factory workers, 25.71% had the habit of
smoking, 0.57% had habit of beetle nut chewing and 3.43%
had the habit of gutka chewing. The total average DMFT score
among all workers was 1.71. About 46.28% of workers required
scaling procedure and 1.71% of workers required periodontal
treatment.

Conclusion: Majority of the participants in the survey had habit
of tobacco chewing and smoking. Participants had problem of
dental caries, gingivitis and periodontitis requiring necessary
treatment.

Keywords: Jeep Battery Factory, Oral Health Status, Treatment
Needs, Oral Habits

INTRODUCTION

The environment is one among the many determinants of
the human health. The key to man’s health lies largely in his
environment, and the survey of the disease is indeed the survey
of man and his environment.1 “Occupational environment”
means the sum of external conditions and influences, which
prevail at the place of work and which have a bearing on the
health of working population.1 The interaction of the individual
with the physical, chemical and biological agents of the work
place has great bearing on his physical and the psychological
health. Exposure to chemical, physical, and biological agents
in the workplace can result in adverse effects on workers
ranging from simple discomfort and irritation to debilitating
occupational diseases such as lung fibrosis, neuropathy,
dearthness, organ damage, oral diseases and cancers of various
sites including oral cavity.2 Dental health is as important as general health, but the irony
is; it has not received the same amount of importance as that
of the general health. This fact is even more prevalent in the
labourers, who are bound to neglect their oral health because of
busy scheduled and stressful life.2 Majority of people employed
in various industries are exposed to perilous environment.
Few studies have shown the association between occupational
exposure and greater incidence of oral diseases.4–7 On review of literature, there was very less information available
on the effects of occupational hazards on oral health status of
individuals in developing countries. Therefore, a survey was
undertaken with aim to assess oral health status and treatment
needs of jeep battery manufacturing workers at Metagalli,
Mysore, Karnataka.

MATERIAL AND METHODS

A cross-sectional, descriptive survey was conducted to assess
the oral health status and treatment needs of the jeep battery
manufacturing factory workers in Metagalli, Mysore, Karnataka
from November 2014 to February 2015. All the required and
relevant information regarding Jeep battery manufacturing
workers was collected using specially designed questionnaire
and also using the employment records of the workers after
obtaining permissions from the management of the factory.
The total population of jeep battery manufacturing factory
workers was 175. Whole sample was included in the survey.
All the jeep battery manufacturing factory workers were
males. Prior permission was taken from the Management of Gillette Jeep Battery manufacturing factory, Metagalli, Mysore to
conduct the oral examination of jeep battery manufacturing
factory workers. Before starting the survey, the ethical clearance
was obtained from the Institutional Ethical Committee of JSS
Dental College, Hospital and Research Centre, Mysore. The
subjects participating in the survey were duly informed about
the purpose of the survey and consent was taken from them
before their participation in the survey in order to prevent
any in-convenience and to ensure full cooperation during
survey.

Inclusion criteria
Battery factory workers of all ages, available at the time of
examination were included in the survey.

Exclusion criteria
Subjects who were not willing to participate in the survey.

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Training and calibration
The examiner and recording assistant (pursuing internship training) was trained and calibrated in the Department of Public Health Dentistry, under the supervision of the staff members to prevent any diagnostic variability among the survey subjects during the oral examinations.

Data collection
A detailed schedule of the survey was prepared well in advance. Care was taken not to disturb the workers during their working period, so the survey was planned to be conducted during free time period of the factory workers. The investigator visited the survey area during the prescheduled time frame in the survey period. Sufficient numbers of sterile instruments were made available for the examination during the survey. The following instruments and materials were used for the survey: Plane mouth mirrors, disposable gloves, explorers, tweezers, kidney trays, CPITN probe, containers (one for used instruments and the other for sterilized instruments), Betadine™, saline, gauze, cotton with cotton holder, mouth masks and data recording proforma. Information regarding demographic details (name, age, sex, location and deleterious oral habits) and oral symptoms recorded. The oral health status was assessed using the DMFT (Decayed Missing Filled Tooth) index, CPITN (Community Periodontal Index and Treatment Needs) index. Clinical examination was done solely by the investigator with the survey subjects seated on an ordinary chair using natural daylight. All the data was recorded by a recording assistant specially trained for the purpose. During the examination, the recording assistant was made to sit closely so that instructions and codes could be easily heard and repeated for confirmation. The interview and examination of a single subject took on average about 15 to 20 min. Those workers who needed immediate care for pain or infection were referred for further treatment.

STATISTICAL ANALYSIS
The raw data obtained was tabulated using the Microsoft Excel spreadsheet software (Microsoft office 2010). The data was analysed using Statistical Package for Social Sciences (SPSS Inc., Chicago, IL, USA) version 17.0. Data was represented in the form of tables.

RESULTS
The study was conducted on 175 jeep battery manufacturing workers, Gillette Jeep Battery factory in Metagalli, Mysore. The mean age of battery workers was 39.5 years. Among factory workers, 25.71% had the habit of smoking, 0.57% had habit of beetle nut chewing and 3.43% had the habit of ghutka chewing [Table 1].

Table 1 shows DMFT score of the workers according to age group. The total average DMFT score among all workers was 1.71. Table 3 shows periodontal status of the workers according to age group. The percentage of workers suffering from gingivitis was 37.14% and Periodontitis with shallow pocket [4-5 mm] and deep pocket [6mm and more] depths were 9.14% and 1.71% respectively. Table 4 shows periodontal treatment needs of the workers. All the workers were suffering from various stages of periodontal disease. About 46.28% of workers required scaling procedure and 1.71% of workers required periodontal surgery.

DISCUSSION
Various factors such as environmental factors, occupational factors, dietary factors, pathologic factors and oral hygiene practices affect the oral health of an individual. Lack of medical

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**Table 1:** Oral habits among Jeep battery manufacturing workers

<table>
<thead>
<tr>
<th>Age (in years)</th>
<th>Number of workers</th>
<th>Smokers</th>
<th>Non-Smokers</th>
<th>Betel nut</th>
<th>Ghutka</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>19-24</td>
<td>53</td>
<td>19.9</td>
<td>4</td>
<td>7.5</td>
<td>43</td>
</tr>
<tr>
<td>25-34</td>
<td>49</td>
<td>27.9</td>
<td>14</td>
<td>28.5</td>
<td>34</td>
</tr>
<tr>
<td>35-44</td>
<td>63</td>
<td>36.5</td>
<td>23</td>
<td>36.5</td>
<td>41</td>
</tr>
<tr>
<td>45-54</td>
<td>10</td>
<td>5.7</td>
<td>4</td>
<td>40</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>175</td>
<td>100</td>
<td>45</td>
<td>25.7</td>
<td>123</td>
</tr>
</tbody>
</table>

**Table 2:** DMFT scores of the Jeep battery manufacturing workers according to age group

<table>
<thead>
<tr>
<th>Age (in yrs)</th>
<th>No. of workers</th>
<th>D</th>
<th>M</th>
<th>F</th>
<th>DMFT</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>19-24</td>
<td>53</td>
<td>57</td>
<td>20</td>
<td>1</td>
<td>78</td>
<td>1.47</td>
</tr>
<tr>
<td>25-34</td>
<td>49</td>
<td>46</td>
<td>17</td>
<td>16</td>
<td>79</td>
<td>1.61</td>
</tr>
<tr>
<td>35-44</td>
<td>63</td>
<td>43</td>
<td>66</td>
<td>13</td>
<td>127</td>
<td>1.93</td>
</tr>
<tr>
<td>45-54</td>
<td>10</td>
<td>8</td>
<td>23</td>
<td>0</td>
<td>31</td>
<td>3.1</td>
</tr>
<tr>
<td>Total</td>
<td>175</td>
<td>154</td>
<td>126</td>
<td>30</td>
<td>310</td>
<td>1.77</td>
</tr>
</tbody>
</table>

**Table 3:** Periodontal status of the Jeep battery manufacturing workers according to age group using CPITN index

<table>
<thead>
<tr>
<th>Age (in yrs)</th>
<th>No. of workers</th>
<th>Score 0 Healthy</th>
<th>Score 1 Bleeding</th>
<th>Score 2 Calculus</th>
<th>Score 3 PPKD 4-5mm</th>
<th>Score 4 Ppkd &gt; = 6mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>19-24</td>
<td>53</td>
<td>38</td>
<td>71.6</td>
<td>3</td>
<td>5.6</td>
<td>12</td>
</tr>
<tr>
<td>25-34</td>
<td>49</td>
<td>29</td>
<td>59.1</td>
<td>2</td>
<td>4.0</td>
<td>16</td>
</tr>
<tr>
<td>35-44</td>
<td>63</td>
<td>22</td>
<td>34.9</td>
<td>2</td>
<td>3.1</td>
<td>26</td>
</tr>
<tr>
<td>45-54</td>
<td>10</td>
<td>2</td>
<td>20</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>175</td>
<td>91</td>
<td>52</td>
<td>7</td>
<td>4.0</td>
<td>58</td>
</tr>
</tbody>
</table>
health care facilities in the factory premises, especially oral health care facilities, reflects the factory employees’ poor health condition.20

The present survey was carried out to assess oral health status and treatment needs of jeep battery manufacturing workers at Metagalli, Mysore, and Karnataka. The response rate of the survey was 100%. All the participants in the survey were male population. The age of the participants who participated in the survey ranged from 19-54 years. In the following survey all variables were subdivided based on the age group to get a definite relationship of the oral health status based on age group. In the survey, deleterious oral habits like smoking, pan chewing and gutka chewing was assessed as these oral habits have proven to have direct relationship with oral health status from many globally conducted studies. The probable reason for such oral habits among the workers may be due to stress and strain associated with their work environment. In the present study ranged from 19-54 years. In the following survey all variables were subdivided based on the age group to get a definite relationship of the oral health status based on age group. In the survey, deleterious oral habits like smoking, pan chewing and gutka chewing was assessed as these oral habits have proven to have direct relationship with oral health status from many globally conducted studies. The probable reason for such oral habits among the workers may be due to stress and strain associated with their work environment. In the present study about 25.71% had the habit of smoking, 0.57% had habit of beetle nut chewing and 3.43% had the habit of gutka chewing. Similar results were seen in studies conducted by Akman et al.20, Saraswathi et al.12 and Townsend et al.13

In the present survey, DMFT index was used to measure dental carries experience of the factory workers. It was found that total average DMFT score among all workers was 1.71. Similar results were seen in studies conducted by Khurana et al.14, Malcolm and Paul15, Ten Bruggen Cate16, Bachanek et al.17, Ahlberg et al.18 and Tuominen et al.19 Dental decay increased with the increase in age in our study and was same as reported by Duraiswamy et al.20 The mean DMFT in our study also increased with the increase in the age which was same as reported by Petersen.21 Amongst the younger workers in our study more number of mean teeth showed no need for treatment, which was contrary to that reported by Tomita et al.22 Mean number of missing teeth due to carries were maximum in older age group which was same as reported by Tanase.23 Percentage of subjects, which were carries free was very high than reported by Duraiswamy et al.20 Missing teeth was the dominant expression of carries experienced in the older age-groups and it was same in both studies. The prevalence of high dental carries experience could be due to the lack of dental care facilities. In the survey, periodontal status and treatment need was assessed using CPITN index. It was found that all the workers were suffering from various stages of periodontal disease. About 46.28% of workers required scaling procedure and 1.71% of workers required periodontal surgery. Regarding the periodontal status of the subjects, higher percentages of subjects in our study were free from any signs of periodontal disease than that reported by Srikanth and Clarke.24 Teeth with probing depths greater than 4 mm increased with the increase in age in this study and it was same as that reported by Lie et al.25 and Kumar S et al.26 The most prevalent treatment need in the present study was oral prophylaxis which was same as reported by Roman and Pop.27 There was an increase in the periodontal pocket and attachment loss prevalence, and it was positively associated with age of the acid factory workers.28,29 The toxic substance in the plaque becomes a source of gingival irritation, which penetrates the gingival epithelium, causing inflammation of the gingival vasculature and its periphery.30 Removal of plaque should be the most important objective for the prevention, control and treatment of periodontal disease.31

### REFERENCES


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