Field Study

Knowledge, Attitude and Practices Related to Occupational Health Problems among Salt Workers Working in the Desert of Rajasthan, India

Kripa Ram HALDIYA1, Raman SACHDEV1, Murli L. MATHUR1 and Habibulla N. SAIYED2

1Desert Medicine Research Centre (ICMR) and 2National Institute of Occupational Health (NIOH), India

Abstract: Knowledge, Attitude and Practices Related to Occupational Health Problems among Salt Workers Working in the Desert of Rajasthan, India: Kripa Ram HALDIYA, et al. Desert Medicine Research Centre (ICMR), India—Workers in the salt industry are exposed to direct sunlight, salt dust and contact with brine. To assess their awareness, attitude and practices related to occupational health problems, 205 salt workers were interviewed about health hazards and problems related to their working conditions, usage of protective measures and suggestions for their improvisation. The brine workers had a fair knowledge of their occupational health problems (98.7%), protective measures (100.0%) and their benefits (100.0%) as compared to non brine workers for whom these figures were 89.0%, 85.8% and 78.7% respectively. The brine workers (29.5%) and non brine workers (31.5%) used unconventional measures to prevent contact with salty water, salt dust, raw salt and glare. There was a huge gap between their knowledge and practice with protective devices, though they suggested improvements in protective devices to increase their acceptability.

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Key words: Salt-workers, Health problems, Knowledge, Practice, Protective measures

The environment and conditions in the work place have important implications in relation to worker’s health. There is relative lack of research studies on workers engaged in unorganized sectors with reference to their health and safety measures1. Rajasthan state is next only to Gujarat in production of salt from subsoil brine in India. Approximately 20,000 workers are engaged in the salt industry in Rajasthan. It is an unorganized sector. The manufacture of salt is highly labour oriented. The salt is manufactured from subsoil brine water which involves two different types of risks to the workers. The workers, who are in direct contact with brine (Brine Workers), sustain frequent injuries to their feet and hands and are exposed to direct sunlight and concentrated brine, whereas those who handle dry salt at the milling and processing units are exposed to salt dust in the work environment (Non Brine workers). The brine pans are situated in remote areas far from rural residential areas; whereas the milling and processing units are established in the towns, engaging urban workers. Our earlier work indicated that dermatological and ophthalmological problems are quite common among these workers2. Several studies on the knowledge, attitude and practice (KAP) of workers engaged in different occupations have been published3–5 but in the context of salt workers, the present study is the first of its kind reporting on the salt manufacturing sites in the desert of Rajasthan. The aim of the study was to assess the level of awareness of occupational health problems by salt workers at their working places and their attitude and practice to prevent the same.

Materials and Methods

A cross-sectional study was conducted among salt workers of Sambhar, Nawa and Rajas salt manufacturing sites of Rajasthan which are at about 150 km from the capital city Jaipur of Rajasthan. Based on observation of 17.3% prevalence of commonly encountered occupational morbidity (ophthalmic disorders) among salt workers2, a sample size of 205 was arrived at so that a sufficient number of workers with occupational morbidity may be included in the sample to make it representative. On an average 400 workers worked at M/S Sambhar Salt on any working day, while 5–20 workers were engaged in each of the small units at Nawa and Rajas. M/S Sambhar salt had one Medical Doctor for the health care of workers but small units did not have any health and occupational...
safety systems or staff for the same. Workers from M/S Sambhar Salt from Sambhar and small units at Nawa and Rajas were invited to participate in a Health Check up camp. The required number of workers was randomly selected from those who participated in their camp. The questionnaire was prepared in Hindi but was communicated to the respondents in their local dialect. It included objective type as well as open ended questions. The questions pertained to awareness of the presence of health hazards such as salt dust and exposure to concentrated brine water, friction with a spade, pricks by sharp salt crystals and health problems related to working conditions, awareness and use of preventive measures if any, reasons for not using and suggestions for improvisation of protective measures. The method involved face to face interviews with selected salt workers in different units by trained field investigators. The data were analyzed with Epi-info 2000 software in respect to the nature of the work, their knowledge, practice concerning protective measures and acceptability and problems encountered while using protective devices during working hours.

**Results**

Out of 205 workers, 78 were engaged in manufacturing salt from brine whereas 127 workers were engaged in processing of dry salt (Table 1). Both types of salt workers had a low socioeconomic status.

**Brine Salt Workers:**

The majority (89.9%) of brine workers were males and 10.1% were females, and the majority (66.7%) of workers belonged to the 40–59 yr age group followed by the 20–39 year group (32.0%).

As regards the knowledge of health problems, 77 (98.7%) mentioned some or other kinds of problems while working in brine salt. Most common problems described were ulcerated feet 56 (71.8%), calloused palms 52 (66.7%), irritation of the eyes 48 (61.5%), injured feet 40 (51.3%), calloused feet (26.9%) and itching and cracks (20.5%).

All the workers had some knowledge of protective measures to prevent health problems while working in brine. But only 23 (29.5%) salt workers were using some type of unconventional safety measures such as ordinary shoes or spectacles or polythene bags etc. to facilitate healing of injuries or irritation caused by sunlight exposure. The reasons for not using safety measures by 55 (61.5%) workers were financial, non-availability of devices and safety devices not provided by the salt manufacturers.

When asked about benefits of using shoes while working in brine water, workers told about prevention of ulcerated feet 78 (100.0%), prevention of contact with hot brine water in summer 61 (80.8%) prevention of injury to feet 59 (75.6%), prevention of contact with cold water in winter 44 (56.4%), enhances the working capacity of the workers 43 (55.1%) and other benefits 7 (9.0%).

Almost all workers 77(98.7%) knew about the benefits of use of goggles during working hours. The benefits revealed were safety protection of the eyes from bright sunlight 55 (70.5%), smooth working 60 (76.9%), prevention of dust particles getting into eyes 31 (39.7%), and other benefits 7 (9.0%).

Only 40 workers (51.3%) knew about the benefits from using gloves. The benefits revealed were: prevention of callouses 30 (38.4%), smooth working 8 (10.3%), and other benefits 7 (9.0%).

Only 26 (33.3%) workers told about difficulty while wearing shoes during working hours: excessive sweating 14 (18.0%), feeling of heaviness of shoes 12(15.4%), entering of salt particles or salty water into shoes 7 (9.0%)

### Table 1. Distribution of knowledge, attitude and practices according to type of salt workers

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Brine workers (N=78)</th>
<th>Non Brine workers (N=127)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>%</td>
</tr>
<tr>
<td>Age (yr)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;20</td>
<td>1</td>
<td>1.3</td>
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<tr>
<td>20–39</td>
<td>25</td>
<td>32.0</td>
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<tr>
<td>40+</td>
<td>52</td>
<td>66.7</td>
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<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>70</td>
<td>89.7</td>
</tr>
<tr>
<td>Female</td>
<td>8</td>
<td>10.3</td>
</tr>
<tr>
<td>Knowledge of health problems</td>
<td>77</td>
<td>98.7</td>
</tr>
<tr>
<td>Knowledge of protective Measures</td>
<td>78</td>
<td>100.0</td>
</tr>
<tr>
<td>Protective measures used</td>
<td>23</td>
<td>29.5</td>
</tr>
<tr>
<td>Protective measures not used</td>
<td>55</td>
<td>70.5</td>
</tr>
<tr>
<td>Benefits of protective measures perceived</td>
<td>78</td>
<td>100.0</td>
</tr>
<tr>
<td>Difficulties perceived in usage</td>
<td>26</td>
<td>33.3</td>
</tr>
<tr>
<td>Suggestions given for improvement in measures</td>
<td>47</td>
<td>60.3</td>
</tr>
</tbody>
</table>
and reduction in work output 3 (3.8%).

12 workers (15.4%) perceived difficulties while wearing goggles i.e. flickering of eyebrows after taking off goggles, pain on bridge of nose while wearing goggles, goggles falling off when working and excessive sweating.

The suggestions for modification of shoes by workers 47 (60.3%) were: provision of socks 17 (21.8%), laces 14 (17.9%) light weight shoes 10 (12.8%), and others 6 (3.9%). The suggestions for improvement of goggles were given as use of good quality material and reducing the cost of goggles.

Non Brine (Dry) Salt Workers:

A total of 127 dry salt workers were studied, of whom 89.8% were males and 10.2% were female salt workers. The majority (71.7%) of the workers belonged to the 20–39 year age group followed by those below 20 yr (15.7%).

The dissemination of salt dust into the environment of the workplace during various processes of salt manufacturing including milling was reported by salt workers; 77 (60.6%) at packing places, 75 (59.1%) at sites of grinder/crushers and 65 (51.2%) at dryers. As regards the knowledge of health problems, 113 (89.0%) mentioned some or the other kinds of problems while working in salt. The most common problems were watering from the eyes 95 (74.8%), bodyaches 78 (61.4%), throat dryness 51 (40.1%), difficulty in breathing 48 (37.8%), diminishing vision in 44 (34.6%) and itching and cracking (20.5%) of the skin of limbs.

Most of the workers, 109 (85.8%), had some knowledge of interventional measures to prevent entry or deposition of salt dust on different parts of the body. But only 40 (31.5%) salt workers were using some type of unconventional safety measures such as cloth as a mask or spectacles to prevent entry of salt dust into the nose and ears 37 (29.1%), 35 (27.6%) used them for covering the mouth and only 16 (12.6%) for the safety of the eyes. Among 40 workers, 34 (85.0%) were not using such measures for all working hours. The reasons for not using safety measures throughout working hours were breathing problem 28 (82.4%), deposition of salt on fine cloth 4 (11.8%) and excessive sweating 3 (8.8%).

The salt workers who were not using any safety measures, 65 (74.7%), said that there were no safety measures made available at the workplaces, 18 (20.7%) were unaware of the safety measures while according to 13 (14.9%) safety measures were too costly to be afforded by them.

Out of 127 salt workers, only 46 (36.2%) had made suggestions to prevent dispersal of salt dust into the environment, but 81 (63.8%) had not made any suggestion. Some important suggestions were to cover outlets of grinders, dryers and crushers 22 (17.3%) with filter cloth, grinding of wet salt 12 (9.5%), using automatic salt plant 7 (5.1%) and installation of an exhaust fan 5 (3.9%).

When asked about the benefits of using a mask while working, 100 (78.7%) knew about some benefits i.e. it prevents the entry of salt dust into the mouth and nose 94 (74.01%), prevents breathlessness 28 (22.05%), enhances the working capacity of the workers 25 (19.68%) and prevents coughing 13 (10.2%) during work.

A high proportion of workers 85 (66.9%) knew about the benefits of using spectacles during working hours. The benefits revealed were: these prevent (i) entry of salt dust into the eyes 76 (59.8%), (ii) watering from eyes 38 (29.9%), (iii) irritation of the eyes due to reflection of sunlight from salt 38 (29.9%), (iv) itching in the eyes 23 (18.1%) and (v) entry of insects into the eyes 19 (15.0%).

Only 21 (16.5%) workers told about difficulty in using a mask during working hours: they complained of difficulty in breathing (5.5%), excessive sweating (5.5%), improper fitting (3.1%), bad odour of the mask (3.1%), and blocking of the filter (1.6%).

The difficulties perceived by salt workers in using spectacles were: pain in the eyes (8.7%), irritation (8.7%), excessive sweating 2 (1.6%) and other difficulties (8.7%). Six workers (4.72%) said they would require repeated cleaning of glasses due to deposition of salt dust on them.

Some suggestions for modification of masks were: (i) it required improvement in the fitting of masks (10.2%), the filter should be improved (7.9%), and to prevent the bad odour of plastic (3.9%) and cloth (3.2%), make it more compact (3.2%), and lightweight (2.4%). The suggestions for improvement of spectacles were the use of good quality material and reducing cost.

Discussion

The production of salt involves various stages and the whole process is labour oriented. The salt workers involved in handling raw salt were exposed to direct sunlight and sub-soil brine water while those engaged in processing of raw salt into edible salt were exposed to direct contact with dry salt and salt dust in the environment. This study highlights the knowledge that salt workers have about the adverse effects of working in the salt industry, the attitude and perception of workers about the use of protective measures at workplaces which may guide policy makers, health planners and researchers interested in making health promotion programs for salt workers. The adverse effects of working in the salt industry were related to ophthalmological, dermatological, musculoskeletal and respiratory systems which were also revealed in an earlier study2. It appears that salt workers understood the immediate adverse effects of working in the salt industry but their perception of long term or chronic effects on their health was inadequate. The workers knew that being in contact with brine, salt or intense sunlight may cause some diseases related to the eyes, lungs and skin and increase in blood pressure, etc.
The use of safety measures during working hours to prevent adverse effects of both brine and salt dust was not adequate. The non-use of safety measures was primarily due to non-availability and non-affordability of devices available on the market. The present form of the shoes, masks, gloves and spectacles were a little less than acceptable, and some problems such as inappropriate fitting, bad odour, sweating and irritation of the eyes arose from their use. There is a need for improvement by modifying the safety measures to make them useful, more acceptable and problem free. Even personal protective equipment with positive results in tests required by the standards can nevertheless prove to be unsatisfactory when used at work. Workers’ perceptions regarding management’s attitudes towards occupational safety and health are closely associated with workers’ unsafe behaviour at work. On the part of management, there was a lack of effort to encourage and supervise the use of protective measures by salt workers though healthcare providers’ counseling has been found to be associated with workers’ skin related prevention practices and knowledge.

In the above perspective, there is a need to develop evidence based methods which can assess the occupational health risks and develop intervention to improve the quality of protective devices and also enable health personnel to give better advice to their workers as providers of quality assured information. The Salt Department, Health Department, Labour welfare department and salt manufacturers could play important roles in preparing strategies which may be effective in bringing about improvement in the use of protective devices and lead to better health of salt workers.

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