

AN EVALUATION OF AWARENESS AND PRACTICES REGARDING WORK RELATED HAZARDS AMONG SALT WORKERS IN SAMBHAR RAJASTHAN

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ABSTRACT

To evaluate the awareness, attitude and practices related to occupational health problems, 200 salt workers were surveyed in Sambhar lake region, Jaipur, Rajasthan about health hazards and problems related to their working conditions and adoption of protective measures. The salt workers have a good knowledge of their occupational health problems, protective measures and their benefits. The salt workers used unconventional measures to prevent contact with salty water, salt dust, raw salt and glare. The questions were related to knowledge of the nature of health hazards such as salt dust and proximity to concentrated brine water, scratching with a spade, pricks by sharp salt crystals and health complications relating to working environments, awareness and use of safety precautions. The morbidities found in salt workers Ocular morbidities Headache and Giddiness (20%), Gastro-intestinal(11%), Breathlessness (7%), Underweight (12%), Musculoskeletal (73%), Chest pain (8%), Dermal (17%), Hypertension (9%), Anemia (5%).

KEYWORDS: Salt Workers, Sambhar Lake, WHO, NCDs, Health Hazards.

Introduction

WHO prepared a report (2013) at the request of the Ministry of Health of Poland. The report examined occupational health in Poland based on national data and information and recommends steps to improve it. It recommended health promotion, preventive initiatives, monitoring and evaluation of occupational health hazards, exchange of information, provision of essential medical support and assistance and conducting health examinations. As per this report, workplace health promotion can reduce non-communicable disease (NCDs) risk factors by addressing physical inactivity unhealthy dietary habits, psychosocial risk factors and by encouraging implementation of smoke and alcohol work free environments. About 400 million European workers are employed in very diverse conditions which have both positive and negative consequences on their health and wellbeing. Unfortunately, annually more than 300,000 lives are lost in European region from various works-related diseases, the majority of which were NCDs.

One of the studies in India observed that “workers working close to salt milling plants may inhale salt particles floating in the air, leading to a rise in plasma sodium, which, in turn, may increase the blood pressure and the risk of hypertension. Eye problems and blindness from the intense reflection of the sun from the water surface are common here. Most people suffer from poor health and very few live beyond 50 or 60 years. Even dead bodies are difficult to cremate due to body’s high salt content,”

Sambhar is a shallow lake which reaches to only about 3m at its deepest, with its average depth not exceeding 0.61 m. The maximum length of the lake basin is 22.5 km, while its width ranges from 3.2 to 11.2 kms. Sambhar Lake was proclaimed a Ramsar site in 1990 because of its ecological and biotic significance, as one of the biggest inland freshwater lake in the west of India. It is located to the west of Jaipur, Rajasthan and this salt lake forms a large salt wetland that makes up the largest area outside

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Rann of Kutch for flamingos. A 5.1 km long dam helps in production of salt. The lake is supplied primarily by the Runpangarh and Mendha rivers. The salt laboratory and the museum are worth visiting near the pool. Every year, 196,000 tonnes of clean salt are generated in Sambhar Lake. Shambhar Salts Ltd.(SSL) and the Hindustan Salts Ltd. joint company and the state government are managing the supply of salt.

Review of Literature

Agnihotram (2005) has studied about occupational health in India. This study revealed that recent industrialization and globalization have changed the occupational morbidity drastically. In India, Occupational health, which involves child labour, weak industrial regulation, a large technology market, reduced industrial care and poor surveillance records, is more complex than any other health issue. The disease burden in that nation cannot be assessed on account of occupational exposure due to inadequate surveillance. The Author also proposed that Indian laws with appropriate compliance machines and the creation of centres of excellence in employment medicine should be urgently stressed on OHS (Occupational Health Safety) in order to get the environment up to speed.

Burra (1988) has examined exploitation of children in Jaipur Gem Industry and health hazards of Gem Polishing. For this study, she interviewed 20 school children between the ages of 11 and 13 at four different schools. In addition; she has also interviewed some of fathers of working children and with local doctors. During the interview, all the children said that their bodies aches and pains after a few hours of worked and some children said that large knots at the base of their finger. Doctors who were interviewed they said that the basic problem was malnutrition. More than 30 percent of working children get tuberculosis 10% of children were allergic dermatitis and an eye-specialist said that (eye-sight problems) presmiopia was the most common complaint amongst gem workers. Some other health problems such as gastroenteritis and worn infection were found common to all people of similar social-economic background.

Dasgupta, N. Manna, and M.Sau (2009) have studied on observations of noise induced hearing loss in a Heavy Engineering Industry in Kolkata. A Cross-sectional study was carried out in 2005-06 in some selected Heavy Engineering Industrial units in Kolkata. Workers complained of bodies aches and pains after a few hours of works. They were categorized the employees according to department and hearing status and exposure to occupational noise and duration of exposure to occupational noise above permissible level. They found that 278 workers in the different department of the heavy engineering industry, 30.58% were suffering from deafness and almost all of them were exposed to noise level more than the permissible level of 90 (db)

Paul Slimpson and Emma Veitch (2011) have studied the Poor Diet in Shift Workers and identified that poor diet in shift workers is also a cause of occupational health hazard like-epidemic of obesity and diabetes.

Methodology

Cross sectional survey was conducted among the workers of Sambhar Salts Limited in Sambhar lake, Jaipur, India. This study was conducted in SambharLake region. There are 38 clusters of villages around the lake. Major settlements include Sambhar, Gudha, Jabdinagar, Nawa, Jhak, Korsina, Jhapok, Kanseda, Kuni, Tyoda, Govindi, Nandha, Sinodiya, Arwikkidhani, Khanadja, Khakharki, Kerwavidhani, Rajas, Jalwalikidhani. Around 1000 salt workers were settled in 10 villages located closely around these salt pans. Of these villages, four were randomly selected for study from March 2017 to January 2018.

In the evening hours when workers were available after the day's work, a door to door survey was carried in selected villages. The sample included 200 salt workers in these 4 villages who worked in salt labour for at least two years. The salt workers were explained regarding purpose of the study. Confidentiality of all participants was maintained.

Result and Discussion

A designed questionnaire was used for collecting information on awareness, attitude and experience about workplace risks and use of safety equipment at job. Salt processing process is filled in the salt cups by the conventional way of evaporating the salt (water with a high salt concentration). It is a labor intensive process that does not use advanced technology. The salt workers at the beginning of the season prepare the salt bowls. This involves purification of silt and accumulated vegetations from previous rains in salt pans that stamp the floor.

The table 1 shows that of the total 200 workers included in the survey; 120 (60%) were males and 80 (40%) were females. The mean age of the workers was 34.5 ± 10 . A higher proportion of the participants was married (70%). None of the salt workers were educated above the higher secondary level.

Table 1: Socio-Demographic Characteristics of the Surveyed Salt Worker (N=200)

Socio-demographic		Frequency	Percentage
Gender	Male	120	60
	Female	80	40
Marital status	Married	140	70
	Unmarried	60	30
Age Years	20-39	114	57
	40-59	66	33
	60	20	10
Educational Status	Illiterate	104	52
	Primary	54	27
	Middle	25	12.5
	High school and higher secondary	17	8.5

Source: field survey

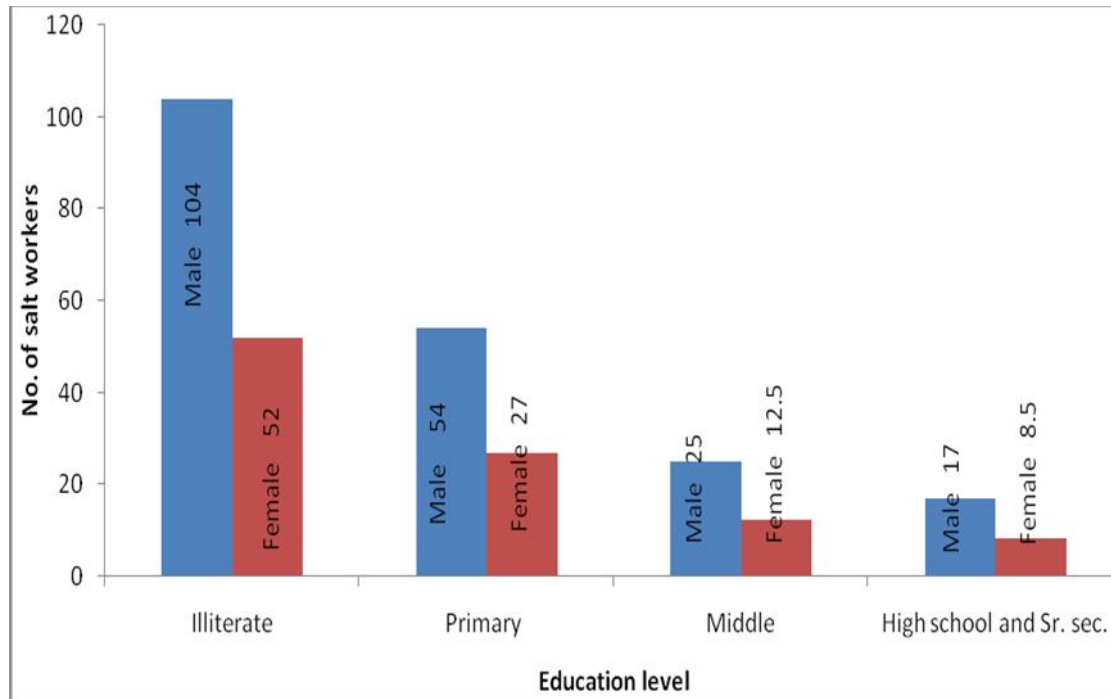


Fig. 1: Education Level of Salt Workers

Table 2: Awareness of Occupational Hazards caused by Salt Work

Occupational Hazards	Percentage	Occupational Hazards	Percentage
Direct sunlight	62	Contact with salt and brine	4
Physical stress	40	Injury from spade	2
Glare from salt crystals	14	Not aware	18
Thickness of palm and sole	17	Caries teeth	14

Source: field survey

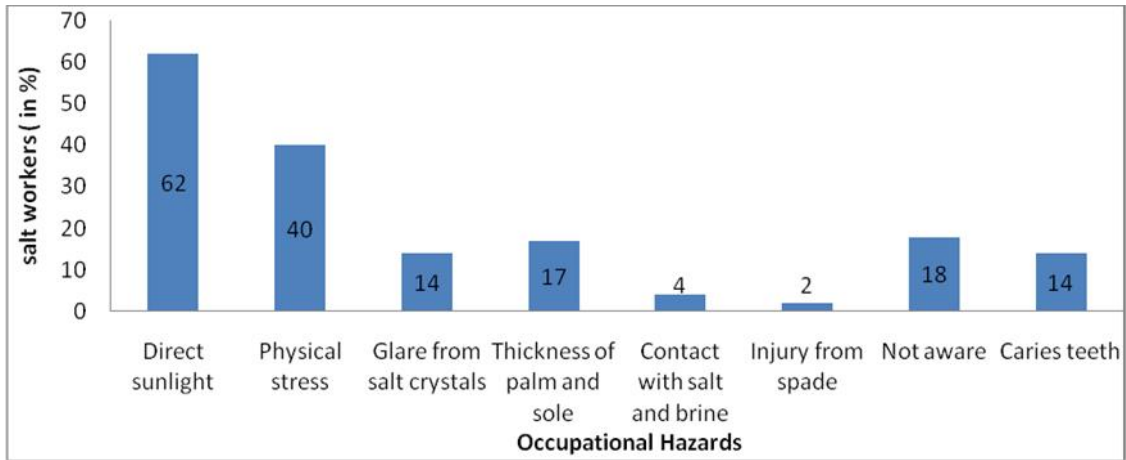


Fig. 2: Occupational Hazards

Table 3: Awareness of Occupational Morbidity

Morbidity	Percentage	Morbidity	Percentage
Ocular morbidities	58	Musculoskeletal	73
Headache and Giddiness	20	Chest pain	8
Gastro-intestinal	11	Dermal	17
Breathlessness	8	Hypertension	9
Injury	7	Anemia	5
Underweight	12		

Source: field survey

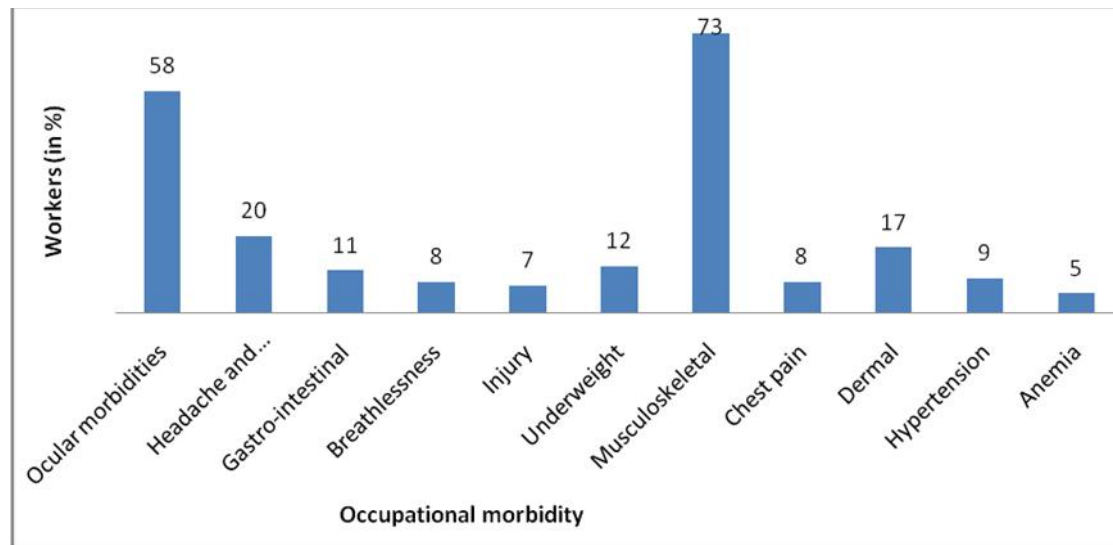


Fig.3: Awareness of Occupational Morbidity

Indian salt industry is a labour intensive industry, with the majority of workers serving are unskilled. The manufacture of salt is highly mechanistic with developing countries such as the US, Canada, Australia, France and Japan, while the salt industry in India is dependent on intensive labour technology. In comparison with organized sectors, there are more unorganized sectors. The salt industries for their employment depend on of intra-states and interstate migrant workers. Workers mostly work on a contract and a subcontract basis for daily wages. Families are working in traditional salt factories and their overall socioeconomic and health condition is added up with a shortage of basic services, inadequate living conditions, no safety nets and low income.

Different social epidemiological tests have shown salt employees to suffer from a number of health problems such as eye disorders related to direct sunlight sensitivity and eye mucosal salt particles. In addition, skin contact with salt solution and skin inflammation caused by fine salt crystals suspended in the air lead to injury and cutbacks often lead to dermatology issues.

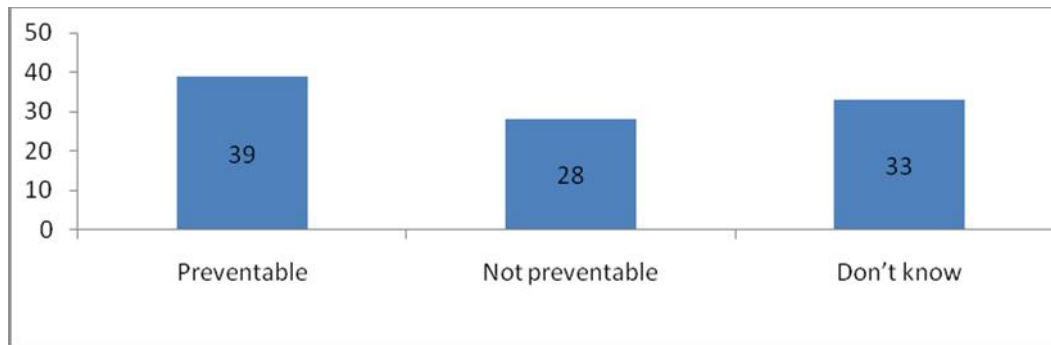
Table 4: Attitude towards Effect of Salt Work on Health

	Percentage
Have harmful effects on health	74 (148)
Have harmful effects but neither cause any disability nor involve any loss of days worked	24 (48)
Have harmful effects but do not cause any disability but involve loss of days worked	28 (56)
Some have harmful effects cause temporary disability	22 (44)
Does not have harmful effect on health	10 (20)
Don't know	16(32)

Source: field survey * parenthesis indicates the numbers.

Table 5: Analysis of Frequency Distribution of Attitude towards Effect of Salt Work on Health

Lower		Upper	Midpoint	Width	Frequency	Percent	Cumulative	
							Frequency	Percent
5	<	10	8	5	0	0.0	0	0.0
10	<	15	13	5	2	18.2	2	18.2
15	<	20	18	5	3	27.3	5	45.5
20	<	25	23	5	2	18.2	7	63.6
25	<	30	28	5	0	0.0	7	63.6
30	<	35	33	5	1	9.1	8	72.7
35	<	40	38	5	0	0.0	8	72.7
40	<	45	43	5	1	9.1	9	81.8
45	<	50	48	5	0	0.0	9	81.8
50	<	55	53	5	0	0.0	9	81.8
55	<	60	58	5	0	0.0	9	81.8
60	<	65	63	5	0	0.0	9	81.8
65	<	70	68	5	0	0.0	9	81.8
70	<	75	73	5	0	0.0	9	81.8
75	<	80	78	5	0	0.0	9	81.8
80	<	85	83	5	0	0.0	9	81.8
85	<	90	88	5	0	0.0	9	81.8
90	<	95	93	5	0	0.0	9	81.8
95	<	100	98	5	0	0.0	9	81.8
100	<	105	103	5	0	0.0	9	81.8
105	<	110	108	5	0	0.0	9	81.8
110	<	115	113	5	0	0.0	9	81.8
115	<	120	118	5	1	9.1	10	90.9
120	<	125	123	5	0	0.0	10	90.9
125	<	130	128	5	0	0.0	10	90.9
130	<	135	133	5	0	0.0	10	90.9
135	<	140	138	5	0	0.0	10	90.9
140	<	145	143	5	0	0.0	10	90.9
145	<	150	147	5	1	9.1	11	100.00



The study shows that salt workers suffer from a number of health problems such as ophthalmic disease exacerbated by irritation triggered by exposure to sunlight and eye mucosal dust. In addition, skin contact with salt solution and skin inflammation caused by fine salt crystals suspended in the air lead to injury and cutbacks often lead to dermatology issues. Respiratory diseases such as asthma, lung inflammation are more prevalent among the workers as a high concentration in salt water, salt dust and mixed dust in their work area, are all the more frequent among workers.

Table 6: Attitude towards Prevention of Morbidities in Salt Work

	Percentage
Preventable	39 (78)
Not preventable	28 (56)
Don't know	33 (66)

Source: field survey

Table 7: Attitude among Salt Workers towards Use of Conventional PPEs

Willingness to use PPE during work	
Willing	28 (56)
Not willing	72 (144)
Benefits of using PPE at work	
Yes	58 (116)
No	42 (84)
Any problem and difficulty in using PPE during work	
Yes	74 (148)
No	26 (52)

Source: field survey

The salt workers work under a pitiless scorching sun doing the toughest of manual jobs without having appropriate safety, health training, and basic amenities like drinking water, shelter and education. Evaluation of the morbidity pattern among this targeted salt workers in Sambhar Lake indicated that they suffered from morbidities like ocular problems, headache and giddiness, musculoskeletal, respiratory and gastrointestinal problems. The morbidities found in salt workers Ocular morbidities Headache and Giddiness (20%), Gastro-intestinal(11%), Breathlessness (7%), Underweight (12%), Musculoskeletal (73%), Chest pain (8%), Dermal (17%), Hypertension (9%), Anemia (5%).

Among the 200 salt workers, 32 (16%) reported of being not aware of any hazard in salt work. Physical stress (40%), direct sunlight (62%) and glare from salt crystals (14%) were the major occupational hazards as reported by them. Majority (73%) of the salt workers considered musculoskeletal problems as morbidity related to salt work, followed by ocular morbidities (58%), giddiness and headache (20%) (Table 3).

Table 8: No. of Salt Workers Using of PPE at Work

Use of PPE	Male	Female	Total
Yes	83.33 (100)	75(60)	80(160)
No	16.67 (20)	25(20)	20(40)
Type of PPE used			
Unconventional	61.67(74)	70 (56)	65 (130)

Cap	54.16(65)	50 (40)	52.50 (105)
Boots	75(90)	37.50 (30)	60 (120)
Gloves	66.67 (80)	68.75 (55)	67.50 (135)
Goggles	50(60)	66.67 (60)	50 (120)
Reasons for not using PPE			
Not made available by employer	61.67(74)	60(75)	74.50(149)
Inconvenience in using	72.50 (87)	90 (72)	79.50 (159)
No need experienced	25 (30)	25 (20)	25 (50)
Shy, no one using	16.67 (20)	37.50 (30)	25 (50)
Cannot afford	29.16 (35)	43.75 (35)	35 (70)
Not aware of any PPE	10 (12)	20 (16)	14 (28)

Source: field survey

Table 9: Hypothesis Test: Independent Groups (t-Test, Pooled Variance)

11.600	difference (Male - Female)			
600.981	pooled variance		<i>Mean</i>	<i>Std. Deviation</i>
24.515	pooled std. dev.	Male	57.1	28.40
8.952	standard error of difference	Female	45.5	19.89
1.30	t	Total	51.3	24.80
0.02056	p-value (two-tailed)			

Table 10: Randomized blocks ANOVA

Mean	Std. Dev	
57.133	28.397	Male
45.533	19.888	Female
80.000	28.284	Block 1
20.000	0.000	Block 2
56.000	15.556	Block 3
65.000	12.728	Block 4
52.500	17.678	Block 5
60.000	42.426	Block 6
67.500	17.678	Block 7
60.000	0.000	Block 8
56.000	18.385	Block 9
74.500	0.707	Block 10
79.500	10.607	Block 11
25.000	7.071	Block 12
25.000	7.071	Block 13
35.000	0.000	Block 14
14.000	2.828	Block 15
51.333	24.800	Total

Source	SS	df	MS	F	p-value
Treatments	1,009.20	1	1,009.200	4.44	.0535
Blocks	13,648.67	14	974.905	4.29	.0050
Error	3,178.80	14	227.057		
Total	17,836.67	29			

Among 200 salt workers, 40 (20%) were not aware of any personal protective measure (PPE) used in salt pans. Majority (65%) of the salt workers were aware of unconventional PPE used in salt work, followed by gloves (67.5%). The awareness on boots, hat and goggles was low. In all of these PPEs, females workers were less aware than the male salt workers. Regarding the attitude towards the hazards and morbidity in salt work, majority of the salt workers, 148 (74%) considered that salt work can adversely affect their health. However, 20 (10%) salt workers considered that their health is not affected by salt work; remaining 32 (16%) did not know whether their health is affected or not by salt work. Out of 200 salt workers, 78 (39%) opined that morbidities in salt work are preventable. However, 56 (28%) were of the opinion that morbidities in salt work are not preventable (Table 6)

Of the total 200 salt workers who were aware of PPEs, only 56 (28%) were willing to use them. 116 (58%) salt workers perceived some or the other benefit in using PPEs at work. 148 (74%) salt workers perceived difficulty in using PPEs at work. Males when compared to the female workers, were more willing to use PPE, they perceived more benefit in using in PPE (Table 7 and 8).

Owing to occupational injuries, the sustained harm at work directly impacts the welfare and agonies of workers, and causes the financial damage to organization. Therefore, by following organizational laws, regulations and procedures, a healthy working atmosphere for workers is essential. The risk to workers and the workplace has a serious impact on productivity of workers and the organization as well. The emphasis must be on prediction of different kinds of hazards at work and designing of appropriate safety measures and the benchmarking of protection performance in order to reduce the imbalance between the risky and health working conditions.

"The fact has been realized quite early in India and safety of working personnel in industries has become a major concern for management ever since the enactment of Factories Act, 1948. The industrial setting in India addresses the occupational health and safety (OHS) to reduce work related injuries and material damage through an injury prevention social marketing approach and formulate policies recognizing the need to adapt based on attitudes and learning styles of employees."

OHS is a delicate matter for any enterprise and the responsibility for improving OHS' success lies with staff, administrators and shareholders of an organization. OHS has the task of maintaining and protecting human capital and facilities at work. Now, because of their occurrence worldwide, industrial injuries are also noticeable. However, in comparison with other sectors, the number of industrial injuries is higher. The incidents arise due to poor accident avoidance measures, lack of knowledge of safety standards, poor staff training and instruction, the usage of old and obsolete machinery and instruments, the use of risk-advised materials and poorly designed transport and control equipment.

If an organization's main aim is to maximize profits, the purpose of risk management is to minimize losses resulting from unexpected and unforeseen losses. Such incidents can lead to personal injuries, claims for liability, life loss or other depressive disorder. The organization's primary goal is to increase profits and risk management aims to minimize risks from unexpected losses that result from unintended occurrences. Such accidents can lead to property damages, lawsuits for liability, fatal injuries or other consequential losses. The OHS guidelines shall prescribe the obligatory standards and rules to remove or mitigate occupational hazards and they need to be applied to each worker to avoid the risk of injury, sickness or death that may arise by reason of his or her occupation.

Conclusion

In a study involving 200 salt workers in Rajasthan, it was found that the brine (concentrated salt water) male workers have a good understanding of workplace issues and preventive strategies compared with female workers. It was found that the salt workers in Sambhar Lake region were aware of the hazards at salt work but the degree and level of awareness was lesser in female than the males. It has been observed that workers from low socio-economic family perform the unskilled tasks and jobs in adverse and unhealthy environmental conditions, which are more prone to disease. Salt work is no exception to this, as a lot of occupational hazards exist and the morbidity is also high in Sambhar Lake region as reported by us previously. Only few studies have been conducted to assess the health status and KAP among salt workers. Salt workers are marginally income-driven seasonal workers. Social and welfare guarantees for salt employees are inadequate. They are vulnerable to hazardous environmental conditions and operate under extremes conditions. Salt workers suffer from various complications of occupational health, but they do not pay much heed to these dangerous conditions because of lack of knowledge and understanding.

The motivation for using personal protective equipment is lacking. The oral abuse and poor personal hygiene are common among the workforce. There are no basic facilities in settlements for salt employees such as portable drinking water, sanitation and waste treatment systems. As safety in each organization is seen as a primary concern, the importance of safe behaviour must also be strengthened with improvements in working environments and investment schemes (safety, tools, facilities and healthcare etc.). The welfare and socio-economic condition of the salt employees should be paid priority by the government and local NGO. They should be trained and made to learn different skills and alternative ways of living.

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