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### RESEARCH ARTICLE

## DERMATOLOGICAL MORBIDITIES IN SALT PAN WORKERS IN A METROPOLITAN CITY: A CROSS-SECTIONAL STUDY

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#### Key words:-

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### Abstract

**Introduction:** India is among the three top countries producing salt on large scale. Salt pan workers toil for about seven to eight hours. Working in salt industry exposes the working population to direct contact with inhalable salt dust, salt crystals as well as concentrated brine leading to corrosive effect of salt, physical stress of hard manual labor. Therefore it was thought to study health problems of salt pan workers in Mumbai especially dermatological morbidity.

#### Objectives:

1. To study the socio-demographic profile of salt pan workers.
2. To measure the point prevalence of dermatological morbidities in salt pan workers.
3. To observe the association between duration of salt works and presence of dermatological symptoms.
4. To study the association between use of Personal Protective Equipments and presence of dermatological symptoms.

#### Methods:

**Study Design:** Cross sectional study.

**Sample size:** 385

**Study subjects:** Individual who were working with dry salt (non-brine workers) and those working in a brine plant (Brine workers) were chosen for the study after taking informed consent.

**Duration of study:** 18 months, August 2011 to January 2014.

Systematic random sampling method was used. Study tools were Interview schedule and Clinical examination. Salt pan workers who worked for more than six months were included. SPSS version 15.0 was used for data analysis.

**Results and Conclusion:** Overall point prevalence of dermatological symptoms was 12.7%. The most common was itching 6.8% followed by burning sensation over limbs 5.2%, dryness of skin 2.3 % and cracks 1.3% over limbs.

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## Introduction:-

India is among the three top countries producing salt on large scale. Salt pans spread over five thousand acres of land at the outskirts of Mumbai city.<sup>(1)</sup> In Maharashtra Salt production takes place at Mumbai, Mumbai Sub-Urban, Thane, Raigad and Sindhudurg.

Workers who work with dry salt in the vicinity of salt milling plants are defined as Non-brine workers and those working in brine plans located far away from milling plants were defined as Brine workers<sup>[2]</sup>. Working in salt industry exposes the working population to direct contact with inhalable salt dust, salt crystals as well as concentrated brine leading to corrosive effect of salt, physical stress of hard manual labor. Therefore it was thought to study health problems of salt pan workers in Mumbai especially dermatological morbidity.

## Rationale of the study:

Saltpan workers at the risk of dermatological symptoms like itching, ulceration, thickness of skin, cracks in skin, burning sensation in skin, etc. Therefore it was thought to study dermatological problems of salt pan workers in Mumbai.

## Objectives:-

To study the socio-demographic profile of salt pan workers.

1. To measure the point prevalence of dermatological morbidities in salt pan workers.
2. To observe the association between duration of salt works and presence of dermal symptoms.
3. To study the association between use of Personal Protective Equipment and presence of dermatological symptoms.

## Materials and Methods:-

**Study area:** Salt pans near Mumbai. **Study subject :** Seasonal Salt pan workers (October to June)

**Study design:** Cross Sectional study of salt pan workers in Mumbai and Mumbai sub-urban.

**Sample size:**  $n = \frac{Z_{1-\alpha/2}^2 p(1-p)}{d^2} = \frac{1.96^2 \times 0.607 \times 0.393}{0.05^2} = 366.56 = 367$

where anticipated population proportion (p) = 60.7, at 95% confidence level, and d = 5 percentage points. 'Individual Saltpan worker' was the study unit.

Study subjects were selected using Systematic random sampling method.

## Inclusion criteria:

Salt pan workers working for more than 6 months period.

## Exclusion criteria:

Salt pan workers who did not give consent to participate in the study.

Pretested semi-structured interview schedule was used for personal interview method and Clinical examination. Referral to dermatologist was made whenever necessary for confirmatory diagnosis. Statistical analysis of the data was done using Proportion and Chi square test, to observe the association between duration of salt works, use of PPE and presence of dermal symptoms.

Institutional Ethics committee approval was obtained prior to the study.

Study was planned and conducted during the period, August 2011-Jan 2014

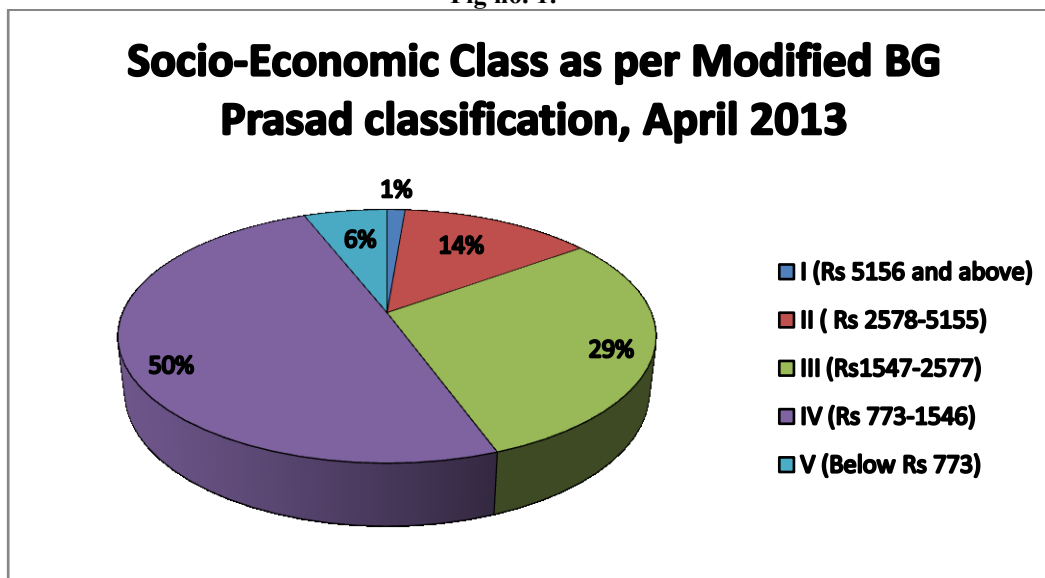
Data collection was done over 14 months i.e. from May 2012 to June 2012.

## Results:-

Out of 385 Salt pan workers 124 (32.2%) belonged to age group 20-29 years i.e. younger age group followed by 85 (22.1%) in 30-39 years age group. Majority of the salt workers were from Maharashtra 246 (63.9%) followed by those hailing from Gujarat 117 (30.4%), Karnataka and Daman Diu. Most of the salt workers were living in nuclear families 265 (68.8%), whereas 103 (26.8%) were from joint families and 17 (4.4%) were from three

generation families. Almost half of the salt workers i.e 180 (46.8%) were illiterate, whereas 35.6 % education up to primary level and 15.3 % secondary level.

Fig no. 1:-



22 % salt workers had worked for 6 to 10 years and 46% for less than 5 years.. Only about 32 % of them had worked as salt workers for more than 10 years. 84% were seasonal and 16% were regular workers. Total availability of any personal protective equipments was 349 i.e 90.64% and use was 67 (17.40%) out of 385. Overall use of goggles by salt workers was only 20% out of 265 and use of shoes by salt workers was 16.66% out of 84. Only 7 salt workers used goggles and caps both. 40.2% salt workers were addicted to only smokeless tobacco , 19.6 % to alcohol and smokeless tobacco and only 11.1% to alcohol whereas 9.2% to tadi.

Table no. 1:-

Dermatological Symptoms	Frequency	Percent Prevalence
Itching	26	6.8
Burning sensation	20	5.2
Dryness of skin	9	2.3
Cracks	5	1.3
All Dermatological Symptoms	49	12.7

The association between dermatological symptoms and duration of job was statistically significant [Table no.2].

Table no.2:-

Duration of salt works ( years )	Dermatological symptoms		Total
	Present (%)	Absent (%)	
0-5	16 (9.0)	161 (91.0)	177
6-10	14 (16.3)	72 (83.7)	86
11-15	11 (22.0)	39 (78.0)	50
16-20	5 (22.7)	17 (77.3)	22
Above 20	3 (6.0)	47 (94)	50
<b>Total</b>	49 (12.7)	336 (87.3)	385

$$\chi^2 = 11.03 \quad P = 0.026 \quad \text{degree of freedom} = 4 \quad \text{Significant}$$

### Discussion:-

In the present study all salt workers were male. Nearly half of them were illiterate. Similar to these findings **Raman Sachdev**[4].reported that nearly half of the salt workers was literate. Most of them were belonging to socioeconomic class IV.Majority had worked for nearly 6 years and were addicted mainly to smokeless tobacco.Findings of **Kripa**

**Ram Haldiya**[3].**MurliLalMathur**[5] were comparable as they also found smokeless tobacco as the main addiction among salt workers. Use of Personal protective equipments was not regular. In the present study overall percent prevalence of dermatological symptom was 12.7 percent. The percent prevalence of dermatological symptoms in brine workers were 42 (13 percent) more than that of non-brine worker 7 (11.3 percent). In contrast **K R Haldiya**[7]. reported that percent prevalence of dermatological symptom among male salt worker and female salt worker was 28.4 percent and 17.8 percent respectively. **Raman Sachdev**[4]. found that overall percent prevalence of dermatological symptoms among salt worker was 43.8 percent such as itching (8.9 percent), ulceration (9.5 percent), thickness of skin (8.1 percent), cracks in skin (6.5 percent), burning sensation in skin (4.8 percent) and dryness of skin over limbs (3.5 percent). **R. Somraj**[6] similarly found that percent prevalence of dermatological symptoms among salt workers was 18.36 percent. **G. Arumugasamy**[8] in Kanyakumari district observed that 8.89 percent salt workers were affected by itchesores.

### Conclusion:-

1. In the present study most of the salt pan workers were mainly from younger age group, Hindu by religion, staying in nuclear families, more than one third of them were migrated and belonged lower middle socio-economic class with almost half of the milliterate.
2. Nearly half of the salt workers had work for less than five years and more than one fifth of the salt workers had work for six to ten years. More than one third of the salt workers had only smokeless tobacco addiction.
3. Though personal protective equipments were available at the work place only one fifth of the salt worker use goggles, shoes and cap as a protection from reflection of salt crystal by sunlight for eyes and skin.
4. As the duration of work increases most of the salt workers suffered from more than one dermatological morbidity.

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