

# A Cross Sectional Study To Assess The Prevalence Of Health Problems And Safety Measures Followed By The Employees Working In Silica Based Industry In Puducherry

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**Abstract:** Occupational safety and health (OSH) also commonly referred to as occupational health and safety (OHS) or workplace health and safety (WHS) is an area concerned with the safety, health and welfare of people engaged in work or employment. The goals of occupational safety and health programs include to foster a safe and healthy work environment The aim of this study is to assess the, health problems among the employees and the available preventive measures followed by the employees working in the silica based industry.

**Materials and Methods:** A total of 105 employees were selected in M/s ACE Glass Industry at Puducherry by using convenience sampling method. A cross sectional study was conducted to assess the available preventive measures and the health status of the employees working in the silica based industry.

**Results:** Nearly 20(19%) of the subjects suffered from respiratory problems such as fever, cough and,17 (16%) of the subjects suffered from musculo skeletal problems such as muscular pain, varicosity There were adequate safety measures provided in the industry and there is a need for regular use of personal protective measures among the employees..

**Conclusion:** Therefore it is evident that personal protective measures protect the employees from occupational hazards. Periodical reorientation regarding the knowledge, attitude and practice of safety measures by the employees is essential in well being of employees working in silica based industry.

**Key Words:** safety measures, employees working in silica based industry.

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## I. Introduction

Occupational safety and health (OSH), which is the discipline concerned with preserving and protecting human and facility resources in the workplace, is an important aspect in reducing risk at workplace. OSH is a basically standard which are set in legislation with the aim to eliminate and reduce hazards at workplace<sub>1</sub>. Occupational safety and health (OSH) also commonly referred to as occupational health and safety (OHS) or workplace health and safety (WHS) is an area concerned with the safety, health and welfare of people engaged in work or employment. The goals of occupational safety and health programs include fostering a safe and healthy work environment<sub>2</sub>.

Joint ILO/WHO Committee on Occupational Health focus on three different objectives: (i) the maintenance and promotion of workers' health and working capacity; (ii) the improvement of working environment and work to become conducive to safety and health and (iii) development of work organizations and working cultures in a direction which supports health and safety at work and in doing so also promotes a positive social climate and smooth operation and may enhance productivity of the undertakings. The concept of working culture is intended in this context to mean a reflection of the essential value systems adopted by the undertaking concerned. Such a culture is reflected in practice in the managerial systems, personnel policy, principles for participation, training policies and quality management of the undertaking.<sub>3</sub>

## II. Statement Of The Problem

A cross sectional study to assess the prevalence of health problems and safety measures followed by the employees working in silica based industry in Puducherry

### Objectives

1. To assess the health status of the employees working in silica based industry.
2. To assess the various sections of work process in the silica based industry.
3. To assess the available preventive measures and its utilization by the employees working in silica based industry
4. To assess the prevalence of safety measures followed by the employees working in silica based industry.
5. To create awareness to the employees against occupational hazard among employees working in silica based industry

### III. Research Methodology:

A cross sectional study design was adopted for this study .The study was conducted in M/s ACE Glass Containers Ltd which is situated in Puducherry. Based on pilot study report, 105 samples were selected from the workmen category. In that, 45 samples were permanent workers and 60 were working as casual labourers.

The researcher explained the study purpose to the workers. Informed consent was taken from each subjects and data was collected from the workers. The demographic data was collected by the investigator using interview technique. Physical assessment was done to the workers with the help of Medical Officer of the Factory. Check list was used to assess the practice of workers in using protective measures. It took 10 minutes for each worker to complete pre assessment.

Each day around 15 – 20 workers were gathered in the factory dispensary. Booklet was also given to each subject to enrich and reinforce their knowledge on safety measures among the workers.

### IV. Results And Discussion:

The demographic data reveals that out of 105 subjects, 53 (50.5%) of them in the age group of 30-39 years , 54 (51.4%) from rural area, 81(77.1%) were married , (38.1%) were technically educated,60(57.1%) of the subjects earn less than Rs.3,000/-, and 19(18.1%) were working around 4–5 years., mostly 97(92.4%) subjects were following shift duty and remaining 8 (7.6%) subjects were in regular duty from 8 to 4 pm schedule.

Physical assessment was done to 105 subjects with the help of factory medical officer. No abnormalities were detected in relation to cardio vascular, genito urinary, gastrointestinal, integumentary & central nervous system.

**TABLE 1: Distribution Of Health Status Of The Subjects** N=105

S.No	Physical assessment findings	No	%
1.	Respiratory Symptoms	20	19
2.	Musculo Skeletal Symptoms	17	16
3.	No abnormalities detected	68	65

Table 1 shows the distribution of the physical assessment findings of 105 subjects. Most of them 68(65%) were asymptomatic and twenty (19%) of the subjects had respiratory symptoms such as cough, fever etc., 17(16%) of subjects had problems related to musculoskeletal system such as muscular pain, leg pain (varicosity) etc. These subjects were treated in the occupational health centre by the factory medical officer, and eight subjects were referred to Government general hospital, Puducherry for further management.

Anthropometric measurements like height and weight were assessed for 105 subjects. In order to assess the nutritional status of the subjects, Body Mass Index (B.M.I.) was calculated by using the formula as  $BMI = Wt / (Ht)^2$  in respect and distributed in the below table.

**TABLE NO.2: Distribution Of Body Mass Index Of The Subjects**

Nutritional Status of the Subjects	Body Mass Index (B.M.I.)	
	No.	%
Under Weight (<18.5)	01	0.9
Normal (18.5 – 25)	68	64.8
Over Weight (26 – 30)	19	18.1
Obese Class – I (31 – 35)	11	10.5
Obese Class – II (36 – 40)	05	4.8
Obese Class – III (>40)	01	0.9

This table 2 shows that among 105 subjects 68(64.8%) of them had normal body mass index. Seventeen (16.2%) of them were found to be obese and 19 of them were presenting with over weight. It was evident that continuous monitoring of nutritional status of the workers takes place an effective role in prevention of occupational diseases.

Study done by Alan H.S. Chan ,et.al (2011) recommended that raising awareness of the concerns of the recycling workers' safety and health by advertising through media, conducting comprehensive and intensive research and the public would have better understanding of situation and start to be aware of the occupational hazards.<sup>4</sup>

Study done by Au Yong Hui Nee(2010) focus the strategy of compliance in occupational safety and health legislation and the safety, health and wellness. He concludes that enterprises are looking for latest management tools to help on organizing the processes systematically and transform the customer requirements into competitive advantages. Hence, the Occupational Safety and Health Management Systems contribute greatly to the enterprise's global competitiveness.<sup>5</sup>

**TABLE 3: Distribution Of The Various Sections Of Work In The Glass Factory**

S.No.	Name of the section	Work process
1.	<b>Sand Plant</b>	Receiving and Checking the raw sand material and processing of raw material takes place.
2.	<b>Batch House</b>	Along with silica sand and minerals, refining and decolorizing chemicals were mixed as required composition.
3.	<b>Furnace</b>	Mixed materials were fed to the glass melting process which takes place at the level of 1500 degree celcius.
4.	<b>Forming</b>	By IS machine refined mottled glass passes at low-level temperature with suitable bottle forms. This process called annealing process.
5.	<b>Foundry</b>	Bottles were inspected and the defective one are discarded. These discarded bottles are recycled again.
6.	<b>Despatch</b>	Bottles were packed and sent to warehouse to dispatch to the clients as per priority and availability.

Table 3 shows the various section in the silica based industry and the work process in making glass products.

Study done by Olufunsho Awodele.,et al(2014)assessed the use of available control measures/initiatives among 400 randomly selected paint factory workers .The results shown that 72.5% of the respondents are aware of the hazards associated with their jobs; 30% have had formal training on hazards and safety measures; 40% do not use personal protective devices, and 90% of the respondents reported symptoms relating to hazard exposure. They concluded that there is a need to develop effective frameworks that will initiate the integration and ensure implementation of safety regulations in paint factories is evident. 6

**TABLE 4: Distribution Of Available Preventive Measures And Its Utilization By The Subjects N=105**

S.No.	Available Protective Measures	Frequency of Usage					
		Always		Sometimes		Never	
		No.	%	No.	%	No.	%
1.	<b>Helmet</b>	87	82.9	18	17.1	0	0
2.	<b>Ear Muff</b>	83	79.0	22	20.9	0	0
3.	<b>Hand Gloves</b>	82	78.1	23	21.9	0	0
4.	<b>Eye Goggles</b>	89	84.8	16	15.2	0	0
5.	<b>Respiratory Mask</b>	84	80.0	21	20	0	0
6.	<b>Apron</b>	105	100	0	0	0	0
7.	<b>Safety Shoes</b>	105	100	0	0	0	0
8.	<b>Protective Shield</b>	60	57	45	43	0	0
9.	<b>Safety Rules</b>	105	100	0	0	0	0
10.	<b>Safety Training Programmes</b>	20	19	40	38.1	45	42.9
11.	<b>Safe Water</b>	105	100	0	0	0	0
12.	<b>Hygienic Canteen</b>	105	100	0	0	0	0
13.	<b>Sanitary Latrine</b>	105	100	0	0	0	0
14.	<b>Occupational Health Centre</b>	105	100	0	0	0	0
15.	<b>Recreational Facility</b>	0	0	35	33.3	70	66.7

Table 4 shows the availability of various safety measures and its utilization of the subjects. There is adequate safety measures provided in the silica based industry. It shows that the personal protective equipments were used by the subjects always as per the Factory Policy. Sometimes they neglect due to discomfort felt by constant usage. Therefore, there is a need for safety training programme to reinforce each subject about the need for safety measures.

**TABLE 5: Distribution Of Personal Protective Equipments According To Various Sections Of Work**

S.No.	Section of work	No of subjects	% of subjects employed	Personal Protective Equipments							
				Helmet	Ear Muff	Hand Gloves	Eye Goggles	Respiratory Airline	Apron	Safety Shoes	Protectiev Shield
1.	<b>Sand Plant</b>	24	22.8	✓	-	✓	✓	✓	✓	✓	-
2.	<b>Batch House</b>	41	39	✓	✓	✓	✓	✓	✓	✓	-
3.	<b>Furnace</b>	03	2.9	✓	✓	-	✓	✓	✓	✓	✓
4.	<b>Forming</b>	25	23.8	✓	✓	✓	✓	✓	✓	✓	-
5.	<b>Foundry</b>	03	2.9	✓	✓	✓	✓	✓	✓	✓	✓
6.	<b>Despatch</b>	09	8.6	-	-	✓	-	-	✓	✓	-

Table 5 shows the various sections in the silica based industry and the provision of personal protective equipments to the subjects based on the need. Among 105 subjects, 41(39%) were working in batch house section, 25(23.8%) were working in forming section, twenty four(22.8%) were working in sand plant

section,09(8.6%) were working in despatch section and 3(2.9%) of the subjects were working in furnace and foundry section.

A cross-sectional study done by Paramasivam, Kamalamma, and Ganguly (2007) found that more than one half of the workers in all the sections were aware of the benefits of personal protective equipment (PPE), and there was a wide gap between their knowledge level and practice with protective devices.<sup>7</sup>

Study done by Ganesh Kumar.S.,et.al(2010)found that overall prevalence rate of accidents was found to be 18.5%.. Accidents were more common among the younger age group and less-experienced workers. There is a need for proper safety training of the workers.<sup>8</sup>

Study done by Sergey Sinelnikov.,et.al(2015) suggested continued effort improves access to research and practical knowledge among occupational health and safety professionals as well as their executive leaders who seek to demonstrate continuous improvement of performance measurement strategies.<sup>9</sup>

### **The Major Findings Of The Study**

The descriptive and inferential statistics was used to analyze the data was found that:

- There were adequate safety measures provided in the industry and there is a need for regular use of personal protective measures among the employees.
- Nearly 20(19%) of subjects suffered from respiratory problems such as fever and cough etc, 17(16%) of subjects suffered from musculo skeletal problems as muscular pain, varicosity etc who were treated by factory medical officer and others were healthy.

### **V. Conclusion:**

The following conclusions were drawn from the study

- Regular use of personal protective measures protects the employees from various occupational hazards.
- Safety training programme on occupational health can be scheduled periodically to reinforce the employees.
- Job rotation among the various sections of the employees can be done to prevent health problems
- Periodical reinforcement of the employees on safety programmes can be done by using various types of audio visual aids.

### **Recommendations**

Based on the findings of the present study, the following recommendations are made

- The study can be replicated using a large sample to validate the findings and make generalizations.
- A comparative study can be conducted among the executives and workmen level of employees.
- A quantitative study can be conducted to evaluate the effectiveness of video assisted teaching programme.

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