



## HEALTH PROFILE OF BURIAL GROUND/ CREMATORIUM WORKERS - A CROSS SECTIONAL SURVEY IN CHENNAI.

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### ABSTRACT

**INTRODUCTION:** This study evaluates the health status of the crematorium workers as they are much exposed to dust and other pollutants. Chennai, the metropolitan city containing different types of crematoriums like Manual, Gasifier and Electric crematoriums has many workers in it as their working environment differs and the number of pollutants also differs. Their health conditions vary regarding to their age, co morbidities, workplace and lifestyle. A direct survey concerned about work nature and health status of those who involve in cremating the corpse has been done.

**METHODS:** A Descriptive cross-sectional survey conducted among the persons who work in burial ground /crematoriums located in 15 zones of Chennai corporation. Purposive sampling technique with the sample size of 91 were used in this study. The data were collected as direct interview, at the workplace of the interviewees through interview forms and the information are recorded in papers. The data were analysed using the EXCEL and SPSS.

**RESULTS:** A total of 91 crematorium workers were enrolled in this study of which 99% persons were male and majority of them work in the Gasifier crematorium. Among the total crematorium workers, the major illness identified was 17.6 % of pre hypertensive, 5.5 % of pre diabetic, 5.4% of loss of appetite and 4.4 % of respiratory disease. When comparing with the type of crematorium electric crematorium is compared to be safe in causing fire injuries and duration of cremation is also less. There is a statistically significant relationship between age and health profile of crematorium workers. (p value 0.016).

**CONCLUSION:** Majority of the health illness observed was hypertension, diabetes, loss of appetite, respiratory diseases and few people had stress followed by disturbance of sleep.

**KEYWORDS :** Crematorium workers, work nature and health profile.

### BACKGROUND:

Certain categories of health work have many risks leading to occupational health hazards. The crematorium workers who clean and burns the corpse are exposed to many infectious diseases. (Ferrerira 2018)

In this study, the burial ground / crematoriums located in the 15 zones of Greater Chennai corporation zone are included. Each zone contains 2- 3 crematoriums. In each crematorium total ten workers like Caretaker, Sanitizing inspector, sweepers and machine operators will be present. This study more specifically includes only the machine operators who cremates the body and collects ashes. There are two types of crematoriums. One is gas and the other one is electric crematorium. The gas crematorium is further classified as biogas and LPG. Many Gasifier crematoriums are present all over the Chennai which contains space for manual method of cremation process. Only 3 electric crematoriums, are present that contains only most experienced staffs as machine operators. This study describes Socio - demographic status, work nature and health status of crematorium workers. Gasifier, manual and electric crematorium have been compared to identify the specific work methods in which the number of pollutants may also differ. Their health conditions vary regarding to their age, co morbidities, workplace and lifestyle. The primary objective of the study is to evaluate the predominant clinical conditions prevailing among burial ground workers and the secondary objectives is to compare the health status of workers in electric and non -electric crematorium.

### METHODS:

The study design is a descriptive cross-sectional study involving, the study population of persons who involve in burning the corpse at the manual, gasifier and electric

crematoriums. The sampling technique is purposive sampling with the sample size of 91. As per corporation of Chennai record only 97 crematorium workers were involved in burning the human corpse. In those 91 workers have been involved in the study, 3 persons were in medical leave. One of the crematoria was in repair and those 3 workers were in long term absence. After getting the informed consent, the participants were enrolled in the study. A semi structured questionnaire with open and close ended questions was created and prepared as interview form. The questions were made so specific in nature involving only the persons who burns and collects the ashes of human corpse either in manual or machinery method. The Validity of the tool was assessed using content validity. Content validity was determined by expert from research officers and Ethical committee members. The data were collected over the period of 2 months. Direct interview was conducted at their workplace. Each question was explained to the participant or interviewee and the responses are recorded manually in the interview forms. All the data obtained were entered into the MS EXCEL and coding was given and the data were transferred into the SPSS VERSION 25 for further analysis. Descriptive statistics were used for demographic variables and health profile is compared with demographic variables by using chi square test.

The study was conducted after the approval given by the City commissioner of Greater Chennai corporation and the Institutional Ethical committee of the Tamilnadu Dr. M.G.R. Medical University. Proposal no. (ECMGR0309168).

### RESULTS:

The questionnaire begins with the socio demographic variables as the age of the participant starts from the range of 17 to 65. The mean age group is 33.4 and standard deviation is

10.1. Majority of the population were men (99%) and only one women crematorium worker. The educational qualification of the crematorium workers is many of the participants are school dropouts (69%) and the highest educational qualification is M. Com as there was only one postgraduate. Majority of the workers works in contract basis and functions as per their contractor orders. Maximum number of populations are younger persons with 1-5 years of experience while comparing with the increased number of years of experience. The distribution of the average monthly income reveals that the maximum number of the participants earns up to 5k. The marital status of the crematorium workers represents 77% of the population are married.

**The Table 1 Represents The Work Nature Of Crematorium Workers:**

VARIABLES		FREQUENCY (n)	PERCENTAGE (%)
1. At which crematorium do you work?	Gasifier	62	68
	Electric	11	12
	Manual	18	19
2. Have you been aware about any safety precautions regarding this job?	Yes	62	68
	No	29	31
3. If yes, how do you know...?	Contractor takes classes	14	15
	Corporation makes awareness	26	28
	Sanitizer inspector & health inspector insists	14	15
	Panchayat training	2	2
	Zonal inspector insists	7	7
	Caretaker insists	5	5
	No training sessions	23	25
4. Have you been provided with any specific clothing?	Yes	84	92
	No	7	7
5. Have you been provided with any PPE during cremation process?	Yes	64	70
	No	27	29
6. From when did you started using PPE?	After Covid 19	80	87
	Before Covid 19	11	12
7. How do you transfer the bodies?	Stretcher	52	57
	Bamboo frames	31	34
	No shifting	8	8
8. Will you wait near the burning bodies to get the ash?	Yes	72	79
	No	19	20
9. If so, how long will you wait?	15 minutes break in between	10	10
	20 minutes	3	3

	45 minutes-1hour	22	24
	1 hour	44	48
	2-4 hours	10	10
10. Do you cremate multiple bodies at a time?	One at a time	63	69
	Two at a time	19	20
	Three at a time	7	7
	Five to eight at a time	2	2

**The Table 2 Represents The Health Profile Of The Crematorium Workers:**

S. No	Health Profile	Frequency (n)	Percentage (%)
1.	Pre – diabetic	5	5.5
2.	Diabetic	4	4.4
3.	Pre- hypertensive	16	17.6
4.	Hypertensive	3	3.3
5.	Both diabetic & hypertensive	1	1.1
6.	Cardiovascular disease	1	1.1
7.	Seizures	1	1.1
8.	Respiratory disease	4	4.4
9.	Gastric disease	2	2.2
10.	Loss of appetite	5	5.4

**The Table 3 Represents Other Health Related Questions:**

VARIABLES		FREQUENCY (n)	PERCENTAGE (%)
1. Do you consume alcohol?	Yes	57	62
	No	34	37
2. Do you have the habit of smoking?	Yes	21	23
	No	68	74
	Tobacco users	2	2
3. Have you experienced any fire accidents during the cremation process?	Yes	24	26
	No	63	69
	Mild injuries	4	4
4. Have you got any burn or scalded marks in your body?	Yes	21	23
	No	70	76
5. what type of disinfectant powders you use to clean the crematorium area?	Phenol & bleaching powder	49	53
	Lizol, Dettol & acid	11	12
	Caustic soda	11	12
	Lime powder	9	9
	Soap oil	4	4
	Sanitizer	6	6
6. Whether it is adequately provided?	Yes	60	65
	No	31	34
7. when do you feel increased skin itching or irritation?	Cremation process	53	58
	Disinfectant process	7	7
	No disturbance	31	34
8. Do you have sleep disturbance due to work constraint	Yes	18	19
	No	73	80

9. Do you use any substances to induce to be fast asleep?	Yes	2	2
	No	89	97
10. Do you have any disturbance in appetite due to work constraint?	Yes	7	7
	No	84	92
11. Are u oppressed with your job that leading u to stress /depression?	Yes	18	19
	No	73	80
12. Did any works assigned to you made you to feel as neglected?	Yes	25	27
	No	66	72
13. Do you have any insurance or not...?	Government insurance	12	13
	Private insurance	4	4
	No insurance	75	82

**Comparison:**

Few Socio demographic factors are compared with the health profile using chi square test. Some of the comparisons are age and health profile, personal habits like alcoholism and health profile, type of crematorium and health profile, fire accidents and type of crematorium, skin disturbances and type of crematorium and psychological changes and type of crematorium. Among that, age and health profile were statistically significant with the P value of 0.016.

**DISCUSSION:**

This is the first study conducted to identify the factors which affect the health of the burial ground / crematorium workers. Many studies have concentrated to bring a standard operative procedure (SOP). This study describes the work nature, personal habits, disease state and occupational injuries leading to health hazards of crematorium workers who works in manual, gas, and electric crematorium.

Majority of the age group falls in the range of 30 – 40 years. Due to covid, workload has been increased to cremate 30- 35 human corpse each day and few crematoriums faced machine repair because many Gasifier crematoriums contains only one machine. In manual cremation due to longer duration those crematorium workers tend to stand for a long time which develops skin irritation, sleeplessness, and depression. Depending upon the fat or lean body stature, duration of cremation extends. Sometimes there will be splashing of water from the edematous human corpse, which causes burns and scalds. While lifting heavy weight corpse, the workers find difficulty in moving the corpse from one place to another and causes accident. So, stretchers are safer in handling.

While cleaning the Gasifier machine at mornings, the workers are affected by boils as the hot water contains oily dust particles. Also, one person mentioned, that he used to spit mucous containing small black ash like particles which caused due to respiratory illness. One crematorium worker told that often he used to get respiratory illness and had the history of Tuberculosis. Few recently joined workers working in Gasifier crematorium faced health illnesses like prolonged cough and dyspnea. S S Bakshi et al 2001 A Code of Practice ensure safety for the crematorium workers when infection is associated with death. The place of routine embalming in modern funeral practice needs research.

A study done at Columbia have prepared an article about the Cemetery disaster planning which contains many steps for the

effective functioning like electric or gas machinery, chemicals, and workers welfare. first, staff must be familiar with the plan, being able to implement its action quickly, and effectively. Second, training in both the skills and equipment needed and an administrative support, including an adequate budget.

Abel M. Okoth-Okelloh et al 2013 (10) When additional training (OSHA) such as heat stress, cold climate work, portable fire extinguisher handling, chainsaw handling, electrical safety, etc. is provided according to the needs of the graveyard. Volunteer groups also need training to ensure that trusted people are informed about what to do in a crisis. Hold a meeting of staff or volunteers dedicated to planning at least once a year. Make sure new employees are aware of their responsibilities. These meetings will help in improve plans and identify areas that need improvement. Importantly, mitigating disaster risk is an ongoing effort. The goal is not to build, but to constantly adjust and change to ensure that employees, are safe. In this study, the "Work Nature" section includes raising awareness of safety precautions. My research also mentioned different uses of chemicals. The most common disinfectants are bleaching powder and phenol. Few people use caustic soda, soap oil, and spray disinfectants to protect Area from infection. However, most crematorium workers use bleaching powder, which is supplied in large quantities to them. They are made available by the authorities and machine operators use them as needed. Other chemicals such as soap oil, laundry detergent and bath soap are purchased to keep the surroundings clean. At some crematoriums, garbage cleaners / sweepers provide excessive amounts of disinfectant.

Due to a lack of information about the poisons produced by cremation, people were not interested in seeking to solve the problem of crematoriums damaging land and soil. Policymakers should launch a program to encourage people to learn about relevant concepts. Bottom ash management has been identified as a serious concern as a result of the inappropriate disposal approach. There should be regulations or norms to follow. Sanitary landfills may be the most environmentally friendly alternative for waste disposal. The study of bottom ash management should be increased. As a result of the findings, a variety of environmental and economic variables, both public and private, businesses and non-profit organizations, must consider funding scientists or researchers to do additional cremation management study. Conduct an education campaign first, a preliminary survey in a community and stakeholders before proposing any cremation management programs. This article has also stated about awareness of cremation work and the safety precautions followed during work which was created by the different authorities.

One of the articles recommends that health education, provision, enforcement and monitoring of the use of PPE be intensified among workers as measures to mitigate hazards in crematorium. The present study exposes that PPEs are given only while handling with the covid-19 affected human corpse. But the crematory workers are provided by a specific uniform with the same color code given throughout all the work zones of Greater Chennai corporation. In one of the crematoria the worker stated that safety precautions are made while handling the corpse died due to communicable disease. Due to inflammable plastic PPE, there are more chances to get burnt while working. While interviewing at Zone 13, one of the workers shared his experience that he has faced the same situation during the pandemic period.

Chibuzor chika et al 2018(3) Due to occurrence of infection in the crematorium, an article states that there is a need for vaccination of all mortuary workers with the three doses of hepatitis B vaccine to protect their health. Education on risks

and standard operating procedure are crucial to safeguard the health of mortuary workers.

CDC and WHO have been provided few guidelines involving the work nature and emotional disturbances of crematorium workers. A common protocol must be followed for the standard operating procedures and good waste management. Health education should be mandatory.

### CONCLUSION:

According to the findings, majority of the population is between the ages of 30 and 40. When comparing the duration of the cremation process, an electric crematorium takes less time and is the safest technique of burning the body because it only has one person involved in a fire mishap, whereas the manual approach has more risks. Many people are in the pre-hypertensive stage, according to their health profile.

Workers at crematoriums are already subjected to high heat and smoke, and most individuals consume alcohol, which is harmful to their health. They were given personal protective equipment (PPE) during the recent covid -19 pandemic. Because PPE is constructed of plastic or a thin sheet-like substance, it is readily combustible, resulting in serious injury to these personnel. They are susceptible to a variety of respiratory and gastrointestinal problems because of prolonged inhalation of dust and smoke. Many of these workers are uninsured, either through the government or privately.

Government should make health insurance a mandatory one, as they deal with early and decomposed human corpse.

**Future Plan:** Follow up for pre hypertensive and pre diabetic cases will be done.

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