

Assessment of Knowledge and Preventive Practices about Occupational Health Hazard among Safai Karmchari of Municipality in Delhi

Vijay Shankar Patel, Utsuk Datta²

¹MD Student, Community Health Administration, The National Institute of Health and Family Welfare, Baba Gangnath Marg, Munirka, New Delhi, India.

²Professor, Department of Education and Training, The National Institute of Health and Family Welfare, Baba Gangnath Marg, Munirka, New Delhi, India.

DOI: <https://doi.org/10.24321/2455.7048.201816>

Abstract

Background: Safai karmchari plays an important role in maintaining the health and hygiene in the cities. This job exposes safai karmchari to a variety of risk factors such as dust, volatile organic matter and mechanical stress, which makes them susceptible to certain occupational diseases. The aim of this study was to find out the awareness about occupational health hazard and safety measures practiced by safai karmchari.

Materials and Methods: This descriptive study had been carried out during the month of December 2017 to mid of February 2018 in the New Delhi Municipal Council area. Primary data was collected through structured observation checklist and interview with 164 safai karmchari. The data was analyzed using Microsoft excel 2007.

Results: Results shows majority of respondent had knowledge about probability of skin allergy/injury/infection while collecting garbage by hand. Most of them had knowledge about probability of traffic accident while working on street. Most of respondents had knowledge about probability of fall while sweeping slippery surface and probability of respiratory problems/eye allergy, also probability of musculoskeletal problems due to their work. Personal Protective Equipment (PPE) apron with reflector, shoes, cap, mask were used by most of the safai karmchari, but few of them uses gloves while working.

Conclusion: It was concluded that the knowledge about occupational hazards as well as its preventive measures was more among trained safai karmchari than in untrained safai karmchari. However, a smaller number of respondents was using PPE while working. There is a need to develop SOP for different activities and preventive measure for safai karmchari. A training program should be introduced.

Keywords: Municipality, Occupational Hazard, PPE, Safai karmchari

Introduction

According to International Labour Organization (ILO), Occupational safety and health are generally defined as the science of the anticipation, recognition, evaluation

and control of hazards arising in or from the workplace that could impair the health and well-being of workers, taking into account the possible impact on the surrounding communities and the general environment. Due to

Corresponding Author: Dr. Vijay Shankar Patel, Community Health Administration, The National Institute of Health and Family Welfare, Baba Gangnath Marg, Munirka, New Delhi, India.

E-mail Id: Vijaypatel79@gmail.com

Orcid Id: <https://orcid.org/0000-0002-9434-3017>

How to cite this article: Patel VS, Datta U. Assessment of Knowledge and Preventive Practices about Occupational Health Hazard among Safai Karmchari of Municipality in Delhi. *Epidem Int* 2018; 3(4): 1-9.

occupational hazard worldwide over 1 million injuries and 2.3 million cases of ill health occur, around 40 million working days are lost and over 25,000 individuals lose their jobs because of injury or ill health. In India and China, the rates of occupational fatalities and accidents are similar at, respectively, 10.4 and 10.5 per 100,000 for fatalities, 8,700 and 8,028 for accidents.¹

Municipal solid waste is an outcome of economic productivity and consumption and includes wastes from households, commercial establishments, institutions, markets, and industries and its handling and disposal is a growing environmental and public health concern. Solid waste management encompasses a wide range of activities including, collecting garbage; collection, sorting recyclable materials; collection and processing of commercial and industrial waste. Risks occur at every step in the process, from the point of collection at homes, during transportation and at the sites of recycling or disposal. They are exposed to occupational health and accident risks related to the content of the materials they handled, emissions from those materials, and the equipment being used. In areas, infectious medical wastes and toxic industrial wastes are not segregated from domestic waste, the waste collectors are exposed to a wide array of risks.²⁻⁵

Safai karmchari (street sweeper) play an important role in maintaining the health and hygiene in the cities. They Sweep street, footpath, markets and community places and collects all the garbage in a container and rolls out garbage containers from roadside, garbage loading on trucks, empty the container and disposes debris at dumping site. They also hand pick the dry waste like papers and leaves from roadside and sometime they clean the roadside drain.⁶

This job exposes them to a variety of risk factors such as dust, bioaerosols, volatile organic matter and mechanical stress; make them susceptible to certain occupational diseases. They usually suffer with respiratory problems like (COPD, asthma, occupational lung disease, bronchitis), Skin disease like (dermatitis, fungal skin disease, eczema.) physical injury to any part of body mostly in legs and hands, eye injury and eye infections, many ergonomic problems like lower back ache. Infections like gastroenteritis are common but hepatitis B and C, HIV infections can also affect them. They can also suffer with Animal bites and road traffic accidents while working on streets.⁷

Hierarchy of hazard control is a system used in industry to minimize or eliminate exposure to hazards. It is a widely accepted system promoted by numerous safety organizations. The hazard controls in the hierarchy are, in order of decreasing effectiveness are elimination, substitution, engineering control, administrative controls, personal protective equipment.

Personal protective equipment, commonly referred to as "PPE" it is the equipment worn to minimize exposure to

hazards that cause serious workplace injuries and illnesses it includes gloves, uniform, respirators, hard hats, safety glasses, high visibility clothing, and safety footwear.⁷

Sultana N and Tania F in their study on sweeping practice and knowledge about occupational safety and health hazards among street sweepers of Shyamoli area in Dhaka city concluded that among the most of respondent faced Problem during work, most of them don't have any idea about hygiene and most respondents do not use protective equipment.¹²

Materials and Methods

The study was addressed to assess the knowledge regarding occupational health hazard pertaining to the nature of job, safety practices adopted for prevention of occupational health hazard during duties of the safai karmchari.

The descriptive study design was used for the study. There were five municipalities in Delhi namely three Municipal Corporation of Delhi (North, East and South), New Delhi Municipal Council and Delhi cantonment. New Delhi Municipal Council was selected purposely for resource limitations of researcher for data collection. The study was done during December 2017 to February 2018. The study protocol was approved by institutional ethics committee of National Institute of Health and Family Welfare as well as approval was also taken from New Delhi Municipal Council to conduct the study.

Observation checklist as well as semi structured questionnaire was prepared on the basis of literature review and tested on the safai karmchari of National Institute of Health and Family Welfare. The primary data was collected using observation techniques and interviews. After taking written informed consent the street sweepers were interviewed in all fourteen circles of New Delhi Municipal council using pretested semi structured interview schedule regarding knowledge of occupational hazard and various PPE used to prevent it. The sweeping practices had been observed for all respondents of all the circles using a structured observation checklist. The secondary data was collected in the form of records, report, IEC material or any written document pertaining to occupational hazard and safety of street sweepers available with New Delhi Municipal Council. The list of personal protective equipment available for sweepers has also been collected.

The street sweepers of New Delhi Municipal Council were distributed among fourteen sanitation circles. Fourteen randomly selected sweepers from each sanitation circle were chosen for interview. Out of randomly selected 196 sweepers, a total of 164 Street Sweeper had given consent for interview. One assistant sanitary inspector (ASI) was selected from each sanitation circle of New Delhi Municipal Council for the study. Three Chief Medical Officer of New Delhi Municipal Council who supervise sanitation in the municipal body were selected for study. Primary data was

collected through structured observation checklist and interview with 164 safai karmchhari. The secondary data was collected in the form of records, report, IEC material or any written document pertaining to occupational hazard and safety of street sweepers available with the Municipal body. The data was analyzed using Microsoft excel 2007.

Results

The knowledge and awareness related to any aspect is directly depended on the literacy status of the individual. In this study among 164 sampled respondents, 21 (12.8%) of respondents were illiterate and 43 (26.2%) were literate (those who had no formal education but knows how to put signature), 23 (14%) of them had education up to primary level where as 71 (43.3%) had education up to secondary level. 4 (2.4%) of them had higher secondary qualification and 2 (1.2%) had graduate qualification.

Table 1. Distribution of knowledge among respondent about hazard due to various sweeping activities

Hazard due to activity	No. of respondent (N=164)	Percent of respondent (N=164)
Knowledge about probability of traffic accident while working on street	130	79.3%
Knowledge about probability of fall while sweeping slippery surface	128	78.0%
Knowledge about probability of respiratory problems/eye allergy while sweeping	136	82.9%
Knowledge about probability of skin allergy/ injury/ infection while collecting garbage by hand	143	87.2%
Knowledge about probability of musculoskeletal problems while rolling out waste in big container and leaning while working	112	68.3%

As explained in Table 1, 143 (87.2%) respondent had knowledge about probability of skin allergy/ injury/infection while collecting garbage by hand and knowledge about probability of traffic accident while working on street was among 130 (79.3%) of them. 128 (78%) of respondents had knowledge about probability of fall while sweeping slippery surface and probability of respiratory problems/eye allergy while sweeping among 136 (82.9%) of respondents. 112 (68.3%) of the respondents had knowledge about probability of musculoskeletal problems due to their work.

Table 2. Distribution of respondents who use personal protective equipment (PPE) while working

PPE	Respondent who use PPE while working (N=164)	Percentage (N=164)
Cap	92	56.1%
Mask	88	53.7%
Apron with reflector	141	86.0%
Gloves	32	19.5%
Boot/ shoes	132	80.5%

As shown in table-2, Personal Protective Equipment (PPE) were used by safai karmchhari, among them 141 (86%) of responders were using the apron with reflector while working and 132 (80.5%) were using the shoes. 92 (56.1%) of sweeper were using cap while working and 88 (53.7%) were using mask while sweeping however only 32 (19.5%) were using gloves while working.

Table 3. Distribution of Knowledge about hazard due to various sweeping activities among trained and untrained respondents

Hazard due to activity	Knowledge among trained (N=60)	Knowledge among untrained (N= 104)
Knowledge about probability of traffic accident while working on street	57 (95%)	73 (70.1%)
Knowledge about probability of Fall while sweeping slippery surface	56 (93.3%)	72 (69.2%)
Knowledge about probability of respiratory problems/ eye allergy while sweeping	55 (91.7%)	81 (77.9%)
Knowledge about probability of skin allergy/ injury/ infection while collecting garbage by hand	55 ((91.7%)	88 (84.6%)
Knowledge about probability of musculoskeletal problems while rolling out waste in big container and leaning while working	54 (90%)	58 (55.8%)

As shown in table 3, Among the respondent 60 (36.6%) had been trained for occupational health and safety while 104 (63.4%) were not trained. The knowledge about occupational hazard among trained respondent are more

compared to untrained respondent. Knowledge about probability of Traffic accident while working on street had been present in 57 (95%) among trained responder and 73 (70.1%) among untrained responder. 56 (93.3%) of the trained respondent had knowledge about probability of fall while sweeping slippery surface and 72 (69.2%) among untrained. 54 (90%) of the trained respondent sweeper had knowledge about probability of musculoskeletal problems while 58 (84.6%) among untrained. 55 (91.7%) of trained respondent had knowledge about probability of respiratory problems/eye allergy while sweeping while 81 (77.9%) among untrained. 55 (91.7%) among trained sweeper respondent had knowledge about probability of skin allergy/injury/infection while collecting garbage by hand and 88 (84.6%) knowledge among untrained.

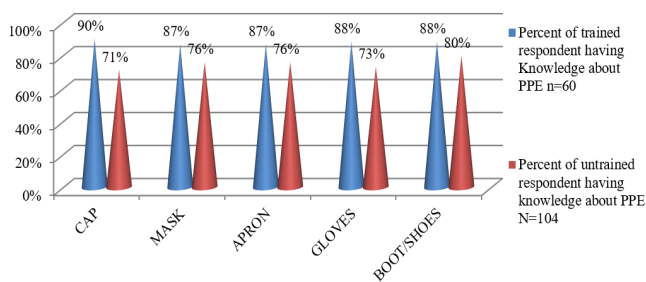


Figure 1. Distribution of knowledge about preventive use of personal protective equipment (PPE) among trained and untrained respondent

The knowledge among respondent about protective measure are more among trained responder compared to untrained. As in Figure 1, 90% of trained respondent had knowledge about bearing Apron with reflector to prevent traffic accident while working on street while 71.1% among untrained respondent. Knowledge about bearing Mask and Cap to prevent respiratory/hair problems among trained respondent was 86.7% and 75.9% among untrained respondent. Knowledge about bearing Boot/shoes to prevent fall on slippery surface/ injury to leg among trained sweepers was 88.3% and 73% among untrained. Knowledge about bearing gloves to prevent skin allergy/ injury/ infection among trained safai karmchari was 88.3% and 79.8% among untrained.

Discussion

In this study most of the Safai Karmchari have below primary education or illiterate however Palve NN et al⁸ in their study of morbidity pattern and occupational hazards in sweepers working at a municipal teaching hospital in Mumbai found out that 61.4% were educated up to secondary, 15.4% up to primary level & only 3.0% till higher secondary, 20.2% were illiterate. Hence it was observed that for the particular cadre the literacy level not required.

In this study most of the Safai Karmchari had knowledge about various occupational health hazard while in a different study conducted by Kabir A et al. on "Sweeping practices, perceptions and knowledge about occupational

safety and health hazards of street sweepers in Dhaka city" reveal that most of the participants were unaware regarding occupational safety and health risk and possible route of transmissions of infections or diseases,⁹ the difference in our result may be due to difference in literacy rate of the responder as well as trained 60 (36.6%) respondent in this study.

Result of this study shows that the Most of the PPE was being used by the Safai Karmchari however gloves was being used by only 19.5% of Safai Karmchari. Similar result was found in a "Study on Health problems among Colombo Municipal Council workers" by Mudalige OMDCS, Dharmathilake AD,¹⁰ who found that the use of gloves was found among 21% sweepers. PPE use among sweepers were only 21% in study by Sultana N, Tania F.¹¹

As shown in Table 3, and Figure 1, it was seen that the trained Safai Karmchari are having more knowledge about occupational hazard as well as trained Safai Karmchari were having more knowledge about use of PPE.

Conclusion

The knowledge about occupational hazards as well as its preventive measures was more among trained safai karmchari than in untrained safai karmchari. However, it was also observed that the practice of PPE among respondents was less than the knowledge about its preventable use. The differences of the knowledge and practice in general may be due to various reasons like non-availability of PPE and attitude of the safai karmchari.

Recommendations

A training program should be introduced for preparing master trainer among sanitary inspector so that they will supervise the sweeper and provide on job training to them. The PPE should be provided to the all the safai karmchari after fixed interval.

Acknowledgement

All the authors acknowledged have contributed significantly in the preparation of this manuscript.

Conflicts of Interest: None

References

1. Alli BO. Fundamental Principals of Occupational Health and Safety. 2nd ed. ILO, Geneva. 2008. Vii-5.
2. Cointreau Levine S. International Occupational and Environmental Medicine. 1st ed. Mosby, St. Louis. 1998. 620-632.
3. Porta D, Milani S, Lazzarino AI et al. Systematic review of epidemiological studies on health effects associated with management of solid waste. *Environ Health* 2009; 8(6)0: 1-14.
4. Athanasiou M, Makrynos G, Dounias G. Respiratory health of municipal solid waste workers. *Occup Med (Lond)* 2010; 60(8): 618-623.

5. Cointreau Levine S. *Occupational and environmental health issues of solid waste management. special emphasis on middle- and lower-income countries.* Urban papers. World Bank Group, Urban Sector Board, Washington, DC. 2006. Available from: [http:// www.worldbank.org/INTUSWM/Resources/up2.pdf](http://www.worldbank.org/INTUSWM/Resources/up2.pdf).
6. Major Initiatives/Swachh Bharat Abhiyan [Internet]. India: Govt. of India Cited 2017 Dec 11]. Available from: http://www.pmindia.gov.in/en/major_initiatives/swachh-bharat-abhiyan/.
7. Personal protective equipment. OSHA, Department of Labour, Washington, DC. Cited 2017 Dec 11. Available from: <https://www.osha.gov/SLTC/personalprotectiveequipment/>.
8. Palve NN, Shidhaye PR, Chaturvedi RM et al. Study of morbidity pattern and occupational hazards in sweepers working at a municipal teaching hospital in Mumbai. *Int J Community Med Public Health* 2014; 1(1): 24-30.
9. Kabir A, Farhana N, Akter F et al. Sweeping practices, perceptions and knowledge about occupational safety and health hazards of street sweepers in Dhaka city, Bangladesh: a qualitative inquiry. *International Journal of Community Medicine and Public Health* 2015; 2(3): 237-243.
10. Mudalige OMDCS, Dharmathilake AD. Health problems among Colombo Municipal Council workers. 2017. Available from: <https://pdfs.semanticscholar.org/5f43/917bdf813e13471f9e82366aa6ac7404500e.pdf>.
11. Sultana N, Tania F. Sweeping practice and knowledge about occupational safety and health hazards of sweepers. *International Journal of Current Research* 2016; 8(5): 30901-30905.

Date of Submission: 2018-12-05

Date of Acceptance: 2019-02-08

Appendix

Tool: 1

National Institute of Health and Family Welfare, Baba Gangnath Marg, Munirka, Delhi

“A Study of Knowledge and Practice among Safai Karmcharis of Municipality in Delhi about Occupational Health Hazard and its Prevention”

Interview schedule for safai karmchari

Date of Interview..... Serial NumberCircle No.....

General Identification

1. Name.....
2. Age.....
3. Sex.....
4. Marital Status.....
5. Father/ Husband Name.....
6. Address.....
7. Educational Status.....
8. Monthly Salary.....
9. Total Years of Service.....
10. Nature of Job..... Regular/ Muster Roll.....

Job Responsibility

1. What are the activities being done by you
 - Sweeping
 - Garbage Collections
 - Emptying the Bin Trolley
 - Emptying the Roadside Dust Bin
 - Any other.....
2. Your Duty Hours..... from to Shift Duty
3. Do you get any Weekly off? Yes/ No
4. Have you received any Training Pertaining to the Activities Performed by you? Yes/ No
5. If yes to 4,

S. No.	Name of Training	Duration of Training	Place of Training	Learning Points

6. To whom you are reporting.....
7. Is any supervision being done during your activities? Yes/ No
8. If yes, whether you are given feedback after such supervisory visit for enhancing your safety at workplace? Yes/No
9. Have you received any SOP or guideline for doing your activities? Yes/No
10. If yes to 12, what are.....
11. Which all Instrument/ tool have been provided to you collect and lift waste from street?
12. Have you received any protective measure from your employer?

S. No.	Type of PPEs	Availability of PPEs		
		Yes=1	No=2	Comments if any
1.	Uniform			
2.	Cap			
3.	Mask			

4.	Apron with reflector			
5.	Hand gloves			
6.	Boot			
7.	Raincoat			
8.	Any other (safety glasses)			

13. Have you been provided any washroom/ toilet near to your workplace? Yes/ No
 14. Have you been provided any drinking water facility near to your work place? Yes/ No
 15. Do you wash your hand after your work?
 16. What are the benefits of hand washing?

Knowledge Assessment

1. Is there any possibility to get sick/ ill due to your nature of job? Yes/ No

S. No.	Activities	Probable disease/ symptoms/hazard	Knowledge Yes/ No	Any other
1.	Sweeping road	Traffic accident		
2.	Sweeping slippery surface	Fall on surface		
3.	Sweeping the uncovered land	Respiratory problems(cough, corriza,breathlessness)/hair problems/ eye allergy		
4.	Collecting garbage by hand	Skin allergy, injury, infection		
5.	Rolling out waste in big container/leaning while Working	Musculoskeletal problems (low back ache, joint pain)		
6.	Any other			

2. What kind of protective measure to be adopted for preventing the disease due to the activities?

S. No.	Activities	Probable disease/ symptoms/ hazard	PPE for it	Any other	Knowledge Y/N
1.	Sweeping road	Traffic accident	Reflector and caution sign board		
2.	Sweeping slippery surface	Fall n surface/injury to leg	Boot		
3.	Sweeping the uncovered land	Respiratory problems/hair problems/ eye allergy	Mask, cap		
4.	Collecting garbage by hand	Skin allergy, injury, infection	Hand gloves		
5.	Rolling out waste in big container	Musculoskeletal problems/ dirt on body	Apron		
6.	Any other				

3. Source of knowledge about occupational hazard and safety.....
- Sanitation Inspector
 - Training
 - Media(TV, Newspaper, Radio etc)
 - Family
 - Any other.....
4. Do you practicing the preventive measure (knowledge & skill)

S. No.	Type of PPE	Do you wear PPE during work?			Reasons for not using PPE
		Yes	No	Any other	
1.	Cap				
2.	Mask				
3.	Apron with reflector				
5.	Hand gloves				
6.	Boot				
7.	Any other				

5. In last six months have you fallen sick? yes/ No
6. If yes , what were the symptoms/health problem/ incidence
 - a) Respiratory problems (cough, corriza,breathlessness)
 - b) Musculoskeletal symptoms (low back ache, joint pain)
 - c) Injury to hand
 - d) Sun burn
 - e) Heat stroke
 - f) Ocular symptoms (Redness, Itching)
 - g) Ear symptoms
 - h) Gastrointestinal symptoms(loose stool, stomach ache)
 - i) Skin symptoms
 - j) Dog bite
 - k) Fall on surface while working
 - l) Accident during work
 - m) Any other
7. Have you visited doctor for the above symptoms? Yes/ No
8. According to doctor what was the disease
9. Have you taken any leave due to sickness? Yes/ No
10. Do you think these sicknesses were related to your work? Yes/ No
11. Have you undergone any pre employment medical examination? Yes/ No
12. Have you undergone any periodical medical examination? Yes/ No
 - How frequently
13. Do you get any health insurance from your employer? Yes/ No

Tool- 2**National Institute of Health and Family Welfare, Baba Gangnath Marg, Munirka, Delhi**

“A Study of Knowledge and Practice among Safai Karmcharis of Municipality in Delhi about Occupational Health Hazard And Its Prevention”

Observation checklist

S. No.	Observation	Answers	Response
1.	Does the sweeper wearing uniform	1= Yes	
		2=No	
2.	Does the sweeper wearing cap	1= Yes	
		2=No	
3.	Does the sweeper wearing mask	1= Yes	
		2=No	
4.	Does the sweeper wearing apron with reflector	1= Yes	
		2=No	
6	Does the sweeper wearing boot	1= Yes	
		2=No	
7.	Does the sweeper wearing gloves while collecting waste	1= Yes	
		2=No	
8.	Broom used by sweeper is somewhat equal to the height of the sweeper	1= Yes	
		2=No	
9.	collecting waste trolley is used	1= Yes	
		2=No	