

Occupational Health Hazard Among Waste Collectors of Bhopal City

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Abstract

Background: The manpower which collects waste from urban localities to dumping or disposal site is exposed to a number of health hazards which are of physical chemical and biological nature. The waste collectors have the seventh most dangerous job in the world. The working conditions of waste collectors are very poor and are violation of human rights.

Objectives:

1. To Identify health problems in solid waste collectors of Zone-2 (old city) of Bhopal
2. To Educate them about their occupational hazards and measures to prevent them
3. To sensitize the municipal authorities about their problems and the need for provision of safety devices and measures
4. To assess the increase in the use of safety devices and measures

Material and Methods: All workers of zone-2 Bhopal were called for health checkup and health education at the Urban Health and Training Centre of the Department of Community Medicine, Gandhi Medical College, Bhopal. Health check up was done to access their health problems. Data regarding their knowledge, attitude and practices about occupational health hazards was using a semi-structured questionnaire. Thereafter, they were given health education about the hazards of their occupation and measures to prevent them. The results of the study were communicated to the municipal authorities for appropriate action.

Results: The mean age of the study subjects was 35 years. All of them denied using protective devices like boots and gloves during waste collection. The morbidities observed were injuries, injuries with sharp (41%), dermatological problems (15%), Arthritis (10%), abdominal pain and loose motions (8%) snake bite (1.6%), others such as high BP, diabetes (13%) and none (11%). The knowledge and attitude of the workers regarding their health problems was poor.

Conclusion: Injuries were the most common morbidity among waste collectors. None of them were provided with any protective devices. The knowledge and attitude of workers about prevention of occupational health hazards was poor. There is a need to raise awareness about their problems among the municipal authorities and the public.

Keywords: Municipal solid waste, occupational injury and accidents, work related health hazards

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Municipal Solid Waste (MSW) - commercial and residential wastes either solid or semi-solid. More than 1lakh metric tons per day of municipal waste is generated in India. Municipal solid waste handling and disposal is a growing environmental and public health concern.¹

Municipal solid waste is an outcome of economic productivity and consumption and it includes wastes from households, commercial establishments, institutions, markets, and industries and its handling and disposal is a growing environmental and public health concern. Population growth and economic development have brought increasing amounts of solid waste to urban areas.²

The management of the solid waste poses risks at every step in the process, from the point of collection at homes, during transportation and at the sites of recycling or disposal. This waste is handled by untrained waste collectors whose plight is a neglected issue in developing countries including India. They are exposed to occupational health and accident risks related to the content of the materials they handle, emissions from those materials, and the equipments being used.² In areas where infectious medical wastes and toxic industrial wastes are not segregated from domestic waste, the waste collectors are exposed to a much greater risk.² As a result of their exposure to multiple risk factors they suffer from high rates of occupational health problems.^{3,4} Most diseases (Water borne, air born, Contact) have exposure pathways and most injuries have contact pathways (Hepatitis B virus, Human immunodeficiency virus, Tetanus).³ Making waste technologies more contained, reducing contaminant emissions, changing working methods to interrupt the pathways and use of protective clothing can reduce risks.² In developing countries, the waste discharged for collection is seldom stored in closed containers and is dumped on the ground directly, requiring that it be shoveled by hand, or left in an open carton or basket to be picked up by hand.⁵ Workers, therefore, have significantly more direct contact with solid waste than their counterparts in high income countries, who predominantly handle sealed plastic bags and covered dustbins.⁵ The exposure to the health risks were not yet identified as a special occupational problem. In most high income countries data on health and accident consequences is inadequate, and in developing countries almost nonexistent. In developing countries like India, there has been little study of the health and injury incidence of solid waste workers. Most of the reviewed studies suffer from limitations related to poor exposure assessment, and lack of information on relevant confounders.⁶ Waste work is overridden with the social, economic, and environmental deprivations and also involves gender issues.⁷ The working conditions for women sweepers are often very poor, they may have no protective wears or equipments but few complain about the situation.⁷ In this context to understand and assess the health risks involved in municipal solid waste management, a study was conducted among Municipal

solid waste collectors in Bhopal, where the problem has worsened due to high consumption pattern and per capita solid waste generation and low per capita availability of land.

Research Question

Will the assessment of occupational health problems among the waste collectors of old city of Bhopal and sensitization of municipal authorities leads to adoption of safety measures by at least 50% of the workers.

Review of Literature

Only few studies have been done on the plight of waste collectors in India. These problems have largely been neglected in the country. The poor hygienic behaviour and poor socio economic conditions, habit of consuming alcohol aggravate the risk of morbidities. Skeletomuscular and gastrointestinal problems were more common in female waste handlers. The US Bureau of labour statistics reported that garbage collectors have the 7th most dangerous job in the world. The municipal solid waste (management & handling) rules 2000 scheduled II strictly inhibit the manual handling of solid waste but if in unavoidable condition due to constrains manual handling shall be carried out under proper safety measures. There are no provision for the health and welfare of waste collectors in the Solid Waste Management Rules, 2016.

Occupational Risks Associated with Solid Waste Management in the Informal Sector of Gweru, Zimbabwe:⁸

According to the study, solid waste was divided into bio-degradable and non bio-degradable. The most hazardous to human are the non bio-degradable wastes such as cadmium, zinc, arsenic, lead and myriad of toxic chemicals which are neurotoxin and carcinogenic.

Occupational Health Problems of Municipal Solid waste workers in India:⁹

Cross-sectional descriptive study was conducted among solid waste management workers of Kerala in India. Data were collected by direct Interview and clinical examination using a structured questionnaire. Most common health problems in them were dermatological infections followed by genitourinary and eye problems and least were respiratory diseases. They were frequently exposed to injuries. 73% had history of injury with sharp objects during past 1 year.

Occupational health problem among door to door waste collectors in Surat, Gujarat:¹⁰

A cross-sectional survey among 300 door to door waste collectors of Surat Municipal Corporation were selected randomly. Data was collected using semi structured interview schedule and morbidities assessed using operational definitions of the Occupational Safety and Health Authority guidelines. Multiple logistic regression indicates major risk factors were workers new

to the job, untrained workers, manual handlers, risky and unhygienic sorting of waste, non-use of protective equipments, part time job, not following protocol for waste handling and workers collecting household waste less than three tons per day. The poor hygienic behaviours and poor socio economic conditions, habit of consuming alcohol aggravate the risk of morbidities. Female waste handlers had more risk of skeletomuscular and gastrointestinal disorders. The study revealed that almost one third of the workers did not follow the waste handling protocols as specified by the municipal solid waste rules . The morbidities reported among them were injuries (77%), skeletomuscular problems (71%), respiratory problems (62.3%), gastrointestinal problems (39.3%), eye problems (36.3%) and skin diseases (30%).

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Methodology

Study design: Observational and educational interventional study.

Study subjects: Solid waste collectors of Zone 2 Bhopal which includes 5 wards (ward no. 6,7,8,10,21).

Study sample: All the workers of Zone 2 (which includes 87 workers as per available information from local municipal office). Relevant Information about the waste collectors - from the local municipal office.

Study Tool

Questionnaire

- demographic information,
- perceived health problems,
- job related issues and
- knowledge about the risk and hazards of their occupation .

The questionnaire was filled by the investigators by interviewing the worker on a one-to-one basis.

Inclusion criteria

- Sampled waste collector with their informed verbal consent will be included in the study.

- Waste collector who are present on the day of study.

Exclusion criteria

- Other zones of the Nagar Nigam Bhopal are not included except zone2.
- Waste collectors who are not willing to give information.
- Waste collectors who are not present on that day

Health Education: At Lady Bhore Hospital (Urban Health & Training Centre)

Health check-up: Urban Health and Training Centre (UHTC) of the Department of Community Medicine, Gandhi Medical College, Bhopal

They were referred to Hamidia hospital if required.

Sensitization session for municipal authorities was conducted in which they were told about

- Health problems among the workers,
- The risk and hazards to which the workers are exposed,
- The need for safety devices and safety measures.

Ethical Consideration

Ethical clearance was taken from the institutional ethical committee. Informed verbal consent were obtained from the study participants. Permission was obtained from the Mayor, Nagar Nigam, Bhopal.

Dissemination of Results

The report of the study will be disseminated to:

1. Mayor, Bhopal
2. Municipal commissioner
3. Human rights organization

Results

Work Conditions

- Among 61 waste collectors 33% were permanent employees .
- According to government provision the workers should work regularly for 2 years to become permanent in their job.
- During their job they are not provided with any training and information about the hazards associated with the occupation.
- Waste collection is not mechanized and the workers collect the waste manually using spade.
- They are not provided any safety equipments/devices i.e gloves, Masks, aprons and boots.
- They collect waste with bare hands and without boots exposing themselves to infections and injuries.
- Some of them use handkerchief to cover their mouth

and nose while working.

Awareness Status

- About 22% of them were aware about the respiratory problems and allergic manifestations associated with their occupation mostly because of personal experiences.
- None of them were aware about the risk of typhoid, diarrheal diseases, tetanus etc.

Personal Hygiene

- All of them wash hands and take bath after work everyday.
- Most of the male workers chew tobacco during their work. They don't wash hands when they put tobacco in their mouth from the tobacco pouch.

Injuries

- Suffer minor cuts and rashes frequently.
- When injured majority of them were not provided with any medical assistance and paid holidays.
- 3% of them had major injuries requiring surgical assistance, which they managed on their own.
- One worker had a life threatening snake bite for which he remained admitted for more than a month in a hospital.

Chronic Diseases

- Most of them did not have any history of TB, HTN, COPD, DM etc.
- Many females complained about chronic back pain.

Table 1. Health Problems observed in the workers

Injuries	Number	%
Injuries with Sharp	25	41
Skin Diseases	9	15
Arthritis	6	10
Abdominal Pain, Loose Motions	5	8
Snake Bite	1	1.6
Others (High Bp, Diabetes)	8	13
None	7	11

Immunization

- None of them were immunized against Hepatitis-A, Hepatitis-B and typhoid.
- 30% of them received tetanus injection following injuries.

Conclusion and Recommendations

Community participation has a direct bearing on efficient municipal solid waste management. Yet, the municipal authorities have failed to mobilize the community and educate citizens on the rudiments of handling waste and proper practices of storing it in their own bins at the household-, shop- and establishment-level. In the absence of a basic facility of collection of waste from source, citizens are prone to dumping waste on the streets, open spaces, drains, and water bodies in the vicinity creating insanitary conditions. People assume that waste thrown on the streets would be picked up by the municipality through street sweeping. The results of the present study revealed presence of health risks. The prevalence of injuries with sharps, dermatological, arthritis, musculoskeletal problems, abdominal pain and loose motions were reported to be high among municipal waste collectors. As with any occupational health study due to the "healthy worker effect," those workers with severe morbidity may leave the job resulted in under reporting. measures are required to improve the working environment of waste collectors by ensuring availability protective gears, clean drinking water and washing and sanitation facilities during working hours. More ergonomic principles should be incorporated. A system of health recording and routine surveillance among municipal waste collectors should be implemented. Local medical schools and occupational health institutes should be encouraged to study the health of solid waste workers in comparison with appropriate baseline control populations due to the significant deficiency of epidemiological data in this sector along with further follow up studies. Policy makers should enforce training occupational health and safety before engaging to waste collection job for every waste collector.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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