# **Original Research Article**

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# Occupational health morbidities and associated socio-demographic variables among street sweepers in a metropolitan city

# Tuhina Mishra<sup>1\*</sup>, Neelam Sukhsohale<sup>2</sup>, Ranjit Mankeshwar<sup>2</sup>

<sup>1</sup>Department of Community Medicine, Grant Government Medical College, Mumbai, Maharashtra, India

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\*Correspondence: Dr. Tuhina Mishra,

E-mail: tuhina1997mishra@gmail.com

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#### **ABSTRACT**

**Background:** In India, the traditional culture has stigmatized street sweeping as a filthy and lowly occupation. The medical problems of these workers are further compounded by various socioeconomic factors such as poverty, lack of education, poor housing conditions and poor diet. The objective of the current study was to assess the socio demographic profile of the street sweepers, the morbidities prevalent amongst them and to establish an association between socio demographic variables and various morbidities.

**Methods:** A cross sectional questionnaire based epidemiological study was carried out ,after taking written consent, amongst 100 street sweepers belonging to age group of 18-60 years in South Mumbai under E ward of Brihanmumbai Municipal Corporation for a period of 2 months.

**Results:** Skin problems (91%) followed by musculoskeletal disorders (88%) were the most common morbidities observed amongst street sweepers predominantly in males belonging to the age group of 40-50 years. The prevalence of anemia was found to be relatively higher in females with low socio-economic background (6.7%). It was also observed that greater the duration of services, more was the risk of morbidities like musculoskeletal disorders (88.5%), respiratory disorders (11.5%), hypertension (6.4%) and cardiovascular disorders (1.3%).

**Conclusions:** The most common morbidities observed were skin problems (91%) and musculoskeletal disorders (88%) predominantly in males belonging to age group 40-50 years. Anemia was more common in females. Additionally, illiteracy was a risk factor for respiratory symptoms (14.7%).

**Keywords:** Health hazards, Occupational health, Street sweepers

#### **INTRODUCTION**

One of the major public health concerns worldwide and one of the most under-researched topics especially in low- and middle-income countries is occupational health hazards. Sweepers play an integral part in maintaining hygiene and cleanliness in the cities and towns. Street sweeping exposes the sweepers to a number of risk factors such as bio-aerosols, volatile organic matter, exposure to dust particles, mechanical stress, noise, vibrations, radiation and work related stress thus making them vulnerable to a number of health complications like

diseases of respiratory system and eye, accidents, injuries, cuts and wounds, skin infections, animal bites etc.<sup>1</sup>

About seventy five percent of the global workforce lives and works in the third world countries. The International Labor Organization (ILO) estimates that more than 125 million workers are victims of occupational accidents and diseases in a single year.<sup>2</sup> Each year an estimated 2.2 million men and women die from work related injuries and diseases and 160 million cases of new diseases arise.<sup>3</sup>

Occupational health hazard that a street sweeper can be exposed to are physical, chemical, biological,

<sup>&</sup>lt;sup>2</sup>Department of Community Medicine, Sir Jamshedji Jeejeebhoy Group of Hospitals, Mumbai, Maharashtra, India

psychosocial and ergonomic hazards. Physical health hazards includes signs like rash, sunburn, heat stress, headache, breathlessness, skin cancer and temporary loss of hearing or permanent hearing loss from exposure to noise. Chemical health hazards include headaches, dizziness, fatigue and respiratory pollutants of vehicles on the road such as carbon monoxide, carbon dioxide, sulphur dioxide and particulate matter. Biological health hazards include bacterial endotoxins, fungal secretions and micro-organisms present in aerosols created during the sweeping and cleaning process.<sup>4</sup> Psychosocial health hazards include social isolation, higher risk of being victim of violence, working at unsociable hours, fatigue, disruption of work-life balance and higher exposure to dangerous substances such as cocaine, heroin, tobacco etc.5 Ergonomic risk factors involve tasks such as use of risky equipments or tool, unhealthy work station/practice, improper policy of organization and poor inter- personal relationships. The aforesaid occupational hazards cannot be resolved as there are complexities and have different health effects. The medical problems of these workers are further compounded by various socioeconomic factors such as poverty, lack of education, poor housing conditions and poor diet.6 Moreover, scientific studies on morbidity profile of street sweep workers are scarce. The present study was carried out to throw light on various morbidities in this occupational group.

#### **METHODS**

#### Study design and setting

A cross sectional epidemiological study was carried out after getting approval from the Institutional ethics committee (IEC). The study was conducted for a period of two months from 1st July 2019 to 31st August 2019. Street sweepers working in South Mumbai under E ward of Brihanmumbai Municipal Corporation were included in the study. A total of 100 street sweepers aged 18 to 60 years working under Brihanmumbai Municipal Corporation were included in the study.

#### Data collection

Informed consent in the participant's own language was taken from each participant who fits the selection criteria before beginning the interview. Relevant documents like previous health checkup documents and prescriptions were examined. Identity of each participant was kept confidential. A questionnaire was formulated and validated by a pilot study before the start of the study. We conducted direct face to face interview with the participant to obtain socio-demographic details, occupational history, past and present medical history. Moreover, thorough general, clinical and systemic examination was done to find out morbidities like asthma, hypertension, skin allergy, hearing disorders, eye problems and symptoms like coughs, cold, headache, low back pain, fever, vomiting etc. Injuries that had occurred in the past six months have also been included in the study. Exposure to any sort of occupational hazards if any was also noted. History of illness the sweepers had in the past twelve months and at the time of study were ascertained.

#### Sampling technique

Random sampling technique was used to collect data from 100 street sweepers.

#### Statistical analysis

Descriptive statistics was employed to describe the characteristics of participants and present the overview of the findings. Pearson Chi Square tests were used to determine the association between sociodemographic variables and morbidity profile. All analysis was performed at the 5% significance level (p<0.05) using SPSS IBM version 23 (IBM SPSS Statistics for Windows, Version 21.0, IBM Corp: Armonk, NY).

#### RESULTS

It was observed that the most common health problem was itching which was complained by 91% of the sweepers. The next most common complaint was lower backache which was present in 88% of the participants. Furthermore 43% of the sweepers complained of joint pain while 24% of the participants complained of headache. Other symptoms like cough (5%), wheeze (2%), sneezing due to irritation of nose (5%), chest pain (1%), abdominal pain (3%), fever (2%) and injury (5%) were also present among the sweepers. 6% of the sweepers were previously diagnosed cases hypertension (HTN) while 5% of the sweepers had anemia. Other morbidities like previously diagnosed cases of diabetes mellitus (DM) (1%), tuberculosis (1%), animal bite (1%), asthma (2%) and migraine (5%) were also observed among the sweepers (Table 1).

Table 1: Prevalence of morbidity among street workers.

Health problems	Number (%)
Itching	91 (91)
Lower backache	88 (88)
Joint pain	43 (43)
Headache	24 (24)
Cough	5 (5)
Abdominal pain	3 (3)
Fever	2 (2)
Wheeze	2 (2)
Chest pain	1 (1)
Diabetes Mellitus	1 (1)
Hypertension	6 (6)
Tuberculosis	1 (10)
Asthma	2 (2)
Migraine	2 (2)
Animal Bite	1 (1)
Anemia	5 (5)

<sup>\*</sup>Figures in parentheses indicate percentage.

Table 2: Association between age and morbidities among street sweepers.

A 000	Symptom	S			Morbidities				
Age (years)	RS	CVS	MSD	Skin problems	Other	DM	HTN	Anemia	Others
<40	2 (9.1)	1 (4.5)	18 (81.8)	21 (95.5)	8 (36.4)	0	1 (4.5)	2 (9.1)	3 (13.6)
≥40	8 (10.2)	0	71 (91.0)	70 (89.7)	21(26.9)	1 (1.3)	5 (6.4)	3 (3.8)	3 (3.8)

<sup>\*</sup>Figures in parentheses indicate percentage.

Table 3: Association between gender and morbidities among street sweepers.

	Symptoms						Morbidities				
Gender	RS	CVS	MSD	Skin problems	Other	DM	HTN	Anemia	Others		
Male	10 (11.2)	1 (1.1)	80 (89.9)	81 (91.1)	32 (35.9)	1 (1.1)	5 (5.6)	3 (3.4)	6 (6.7)		
Female	0	0	8 (72.7)	8 (72.7)	2 (18.2)	0	1 (9.1)	2 (18.2)	0		

<sup>\*</sup>Figures in parentheses indicate percentage.

As shown in Table 2, out of 78 sweepers who were 40 years or above, 71 (91.02%) had musculoskeletal disorders (MSD) and 70 (89.74%) had skin problem.

On the other hand, amongst the sweepers who were below 40 years of age, 18 (81.81%) had musculoskeletal disorders and 21 (95.45%) had skin problems.

The complaints of musculoskeletal disorders were more common after 40 years of age because of repetitive, rigorous nature of the occupation. Other symptoms and morbidities more common among street sweepers who were above 40 years of age were symptoms related to respiratory system (RS) (10.2%), hypertension (6.41%) and anemia (3.8%).

Table 4: Association between educational status and morbidities among street sweepers.

Educational status	Symptoms	Symptoms						Morbidities			
	RS	CVS	MSD	Skin problems	Other	DM	HTN	Anemia	Others		
Illiterate	5 (14.7)	1 (2.9)	24 (70.6)	27 (79.4)	8 (23.5)	0	3 (8.8)	1 (2.9)	4 (11.8)		
Literate	5 (7.6)	0	62 (93.9)	62 (93.9)	26 (39.4)	1 (1.5)	3 (4.5)	4 (6.1)	2 (3.0)		

<sup>\*</sup>Figures in parentheses indicate percentage.

Table 5: Association between socio economic status and morbidities among street sweepers.

Socioeconomic class	Sympton	Symptoms Morbidities							
	RS	CVS	MSD	Skin problems	Other	DM	HTN	Anemia	Others
Middle class	9 (10.6)	0	75 (88.2)	77 (90.6)	23 (27.1)	0	5 (5.9)	4 (4.7)	2 (2.4)
Lower class	1 (6.7)	1 (6.7)	14 (93.3)	14 (93.3)	5 (33.3)	1 (6.7)	1 (6.7)	1 (6.7)	4 (26.7)

<sup>\*</sup>Figures in parentheses indicate percentage.

Table 3 shows association between gender and the morbidities present among the street sweepers. Musculoskeletal system related complaints were more common among males (89.9%) than females (72.7%). Skin problems were equally present in both males (91.1%) and females (90.9%).

Anemia was more common among females (18.2%) than males (3.4%). Similarly, hypertension was more common in females (9.1%) than in males (5.6%). Respiratory system related symptoms were predominantly present among males (11.2%). This was probably because of long

term smoking habits which were more common amongst males.

Table 4 depicts the association between educational status and morbidities present among street sweepers. It was observed that among the literate sweepers, 93.9% complained of musculoskeletal system disorders and 93.9% had skin problems. The figures were lower among illiterate sweepers as 70.6% had musculoskeletal disorders while 79.4% had skin problems. Respiratory symptoms were more common among illiterate sweepers (14.7%) than literate (7.6%) sweepers. Similarly

hypertension was more common among illiterate (8.8%) than literate (4.5%).

The association between socio economic status and morbidities present among the street sweepers is represented in Table 5. The socio-economic status was evaluated according to Modified Kuppuswamy Scale. It was observed that morbidities like diabetes (6.7%), hypertension (6.7%), and anemia (6.7%) were more common among lower class than among middle class. Musculoskeletal disorders and skin problems were present in 93.3% sweepers who belonged to lower class. 10.6% of middle class sweepers had respiratory symptoms. 90.6 % sweepers who belonged to middle class had skin problems, while 88.2% have musculoskeletal disorders.

The association between duration of service and morbidities present in the street sweepers was evaluated from Table 6. Out of 78 sweepers who had worked for more than or equal to 5 years, 69 (88.5%) had musculoskeletal symptoms, 70 (89.7%) had skin problems, 9 (11.5%) had respiratory symptoms and 5 (6.4%) had diabetes mellitus.

On the other hand complaints of musculoskeletal symptoms (86.4%) were slightly less among the sweepers who had worked for less than 5 years. However, skin problems (95.5%) and anemia (13.6%) were more common amongst those who had worked for less than 5 years. Cardiovascular symptoms (CVS) were found in males who had worked for more than 5 years.

Table 6: Association between duration of service and morbidities among street sweepers.

Duration of service (in yrs)	Sympton	ıs				Morbid	lities		
	RS	CVS	MSD	Skin problems	Other	DM	HTN	Anemia	Others
<5	1 (4.5)	0	19 (86.4)	21 (95.5)	11 (50)	0	1 (4.5)	3 (13.6)	2 (9.1)
≥5	9 (11.5)	1 (1.3)	69 (88.5)	70 (89.7)	22 (28.2)	1 (1.3)	5 (6.4)	3 (3.8)	3 (3.8)

<sup>\*</sup>Figures in parentheses indicate percentage.

#### **DISCUSSION**

In our study, maximum 68 (68%) belonged to the age group of 40-50 years of which 8 (8%) were females and 60 (60%) were males followed by 12 (12%) sweepers in 30-40 years age group. Similar results were obtained in a study conducted by Nagaraj C et al. in Bangalore on street sweepers, it was observed that majority of the subjects belonged to the age group of 30 to 50 years.8 Sabde YD et al. conducted a study on 149 street sweepers in Nagpur Municipal Corporation and found that 54.6% were males, the mean age of the street sweepers was 39.70 years with standard deviation of 7.15.9 In the present study, 60% had primary education while 34% were illiterate. 3% sweepers were educated up to secondary and 3% up to higher secondary level. In the study conducted by Palve et al on sweepers working in a tertiary care hospital, 164 (61.4%) were educated up to secondary, 41 (15.4%) up to primary level & only 8 (3.0%) till higher secondary, 54 (20.2%) were illiterate. 10

In our study, 56 % were Hindu, 40% were Muslims and 4% were Buddhists. In the study conducted by Palve et al on sweepers working in a tertiary care hospital, 244 (91.4%) were Hindu, 21 (7.9 %) were Buddhist, 02 (0.7 %) were Muslims. 10 Similarly, maximum workers were Hindu as shown by Nagaraj C et al. 8 study in Bangalore. 65% sweepers lived in extended families, 24% in nuclear families and 11% in joint families. 78% of our study subjects had worked for more than 5 years and 22% had worked for less than 5 years. Similar pattern was seen in the study conducted by Palve et al where 77.9% sweepers had completed more than 10 years of service, 22.1% sweepers had completed less than 10 years of

service. In our study, skin itching (91%) and lower backache (88%) were most common complaints among the sweepers. 10 This was followed by joint pain in 43% and headache in 24% of the sweepers. 6% of the sweepers had hypertension and 5% had anemia. Our findings were consistent with those obtained in studies conducted by Gupta SC et al where skin diseases were complained by maximum participants followed by bronchitis and conjunctivitis. 11 Diggikar UA studied the morbidity profile of female street sweepers working in Pimpri-Chinchwad Municipal Corporation (PCMC), Pune. 12 The overall morbidity pattern seen was anemia in 89.1%, backache in 16.2%, recurrent respiratory infection in 10.2%, hypertension in 5.1% and skin allergy in 4.2% of the female sweepers. Contradictory results were obtained from a study conducted by Sabde YD et al. where prevalence of chronic bronchitis was significantly high among street sweepers (5.9%). The high prevalence of chronic bronchitis could be attributed to occupational exposure to dust and smoking habits among street sweepers. Other important morbidities include bronchial asthma, pterygium and conjunctivitis. In the study by Palve et al the morbid conditions (both acute and chronic) were musculoskeletal disorders 55 (20.6%), hypertension 46 (17.2%), gastrointestinal problem 26 (9.7%), eye disorders 23 (8.6%) and respiratory system diseases 21 (7.9%). Diabetes mellitus was seen in 18 (6.7%) and skin diseases in 17 (6.4%).<sup>10</sup>

## Limitations of the study

The study design was cross-sectional study may not establish causal-effect. Sample size representativeness was limited due to logistic issue.

#### **CONCLUSION**

The most common morbidities observed amongst street sweepers were skin problems (91%) followed by musculoskeletal disorders (88%) predominantly in males belonging to the age group of 40-50 years. Moreover musculoskeletal disorders were more common above 40 years (91%) while skin problems were more common below 40 years of age (95.5%).

The prevalence of anemia was found to be relatively higher in females with low socio-economic background (6.7%). Additionally, illiteracy was a risk factor for respiratory symptoms (14.7%). This could be due to overcrowded dwellings, ill ventilated houses and poor sanitation. It was also observed that greater the duration of services, more is the risk of morbidities like musculoskeletal disorders (88.5%), respiratory disorders (11.5%), hypertension (6.4%) and cardiovascular disorders (1.3%).

Safety training and reorientation programs should also be conducted for the street sweepers periodically. An awareness building program coupled with behavior change counseling activities would be appropriate to increase awareness and improve their perception.

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