

Awareness of Occupational Health Hazards among Street Sweepers and Garbage Collectors at Beni-Suef City, Egypt: A Cross-Sectional Study

Mervat A. Rahma*, Ashraf A. Ewis**, Tamer M S. Hifnawy***.

Abstract: Street sweepers and garbage collectors play an important role in maintaining health and hygiene in the communities. However, they usually work at risky environments that expose them to various morbid conditions. In this study, we aimed at evaluating awareness and attitudes of Egyptian street sweepers and garbage collectors regarding the occupational risks they are exposed to and its preventive measures. Therefore, in a descriptive study, 70 randomly-selected street sweepers and garbage collectors from Beni-Suef city, Egypt were randomly selected and approached through direct interviews with a semi-tailored questionnaire. Our results indicated that street sweepers and garbage collectors were aware of occupational health hazards and diseases, to which they are exposed and may encounter at work. Nevertheless, during the past 12 months, 41.4% of them experienced a job-related health problem. They sweep streets and collect garbage directly with unprotected hands and without using any personal protective equipment. Additionally, their attitudes towards taking preventive measures while working did not match their knowledge about their job-related health hazards. We conclude that street sweepers and garbage collectors should be treated as a vulnerable group that requires pre-placement and in-service orientations, health education, vaccinations, medical check-ups, with close monitoring of their attitudes and practice.

Key words: Street sweepers; Garbage collectors; Occupational hazards; Awareness; Attitude; Egypt

INTRODUCTION

Street sweepers and garbage collectors and hygiene in the communities⁽¹⁾ In Egypt, garbage collectors pick the wastes, play an important role in maintaining health

*Department of Industrial Health, Faculty of Nursing, Minia University, Minia, Egypt.

**Department of Public Health and Occupational Medicine, Faculty of Medicine, Minia University, Minia, Egypt.

***Department of Public Health, Faculty of Medicine, Beni-Suef University, Beni-Suef, Egypt.

clean streets and collect garbage from houses by a door-to-door method.

However, not all the wastes are disposed properly by the residents; and a considerable percentage of it remains on streets or discarded on road sides. This contributes to environmental pollution and creates various health problems.⁽²⁾

Therefore, garbage collectors have additional daily tasks of sweeping streets besides garbage collection.

Because of their work environment, street sweepers and garbage collectors are exposed to a variety of risks or hazards that lead to notable morbidities.⁽³⁾ They are mainly exposed to dust, biodegradable trashes, bio-aerosols, volatile organic matters and mechanical stress, which make them susceptible to a wide range of occupational diseases.⁽⁴⁾ Moreover, in many settings they collect bio-hazardous wastes discarded by health care facilities that are located within their working zones;

adding another range of infections and hazards to these workers' health.

Many reports showed that the commonly detected morbid conditions in those workers include diseases of the respiratory system, eye problems, accidents, injuries, infections and skin problems ..etc.^(1,5,6)

In developing countries; including Egypt, those workers clean streets and collect wastes, manually, with little, if any, protective measures against direct dust exposures, wastes' contact and injuries at their workplaces.^(1,7)

Though studies addressing the occupational health hazards among them or investigations regarding their knowledge and attitude towards their occupational hazardous exposures are very scarce.

In this study, we aimed at evaluating the awareness and attitudes of street sweepers and garbage collectors regarding the occupational risks they are

exposed to and the preventive measures they take to avoid their job-related hazardous exposures.

METHODS:

The study was conducted in Beni-Suef city, about 101 kilometers south to Cairo, Egypt. In this city, the number of workers engaged with street sweeping and garbage collection is about 700 workers (300 of them are permanently employed by the government; and the rest of workers, i.e., the other 400, are hired as temporary contractors).

There are two kinds of jobs; a fixed position in which a worker has a permanent position that ensures for him a fixed monthly salary, health insurance in case of sickness or any adverse health condition, with a regular system for working and off-days. The other type of position with the institute for street sweepers and garbage collectors is based on short term temporary contracts that can

be extended or renewed for a year at a time. The contracting workers are paid a fixed amount of money as monthly salaries. This contract system does not provide workers the rights for health insurance or payment for the missing days, during sick-leaves or national holidays.

A total of 70 sweeping and garbage collection workers (10% of the total number of workers) were randomly selected. They belonged to 4 administrative working zones (out of a total of 9 zones of Beni-Suef city) including Haris-square (20 workers), El-Homeyat (20 workers), Moqbel (10 workers), and Al-Jazeera (20 workers).

In order to ensure free and true reporting by the workers, no permission was obtained from the administrative authorities of street sweepers and garbage collectors' institute prior to the interviews; and names of the workers who consented to participate in the study were obscured to

ensure the anonymity and confidentiality of their reports. After being informed about the nature of the study and its objectives, the workers agreed to participate voluntarily in the study and responded to all questions of the questionnaire.

To eliminate inter-observer bias, all interviews were performed by the first author who performed all interviews between October 2008 and September 2009. She “the interviewer” read and explained every item of the questionnaire to the workers and filled out spaces with workers’ answers, responses or comments.

The questionnaire included the following:

- Personal and demographic data such as age, residence, smoking habit, and education level.
- Occupational history including; type of employment, provision of health of certificate, and whether the worker is engaged with other part-time or

additional jobs. Moreover, each worker was requested to specify and indicate if his job necessitates his dealing with any kind of food or not.

- Knowledge about the occupational hazards of street sweeping and garbage collection.
- Attitude towards preventive measures such as vaccination and use of personal protective equipment.
- Their institute administration, if it offers them training or provides them with personal protective clothes and equipment.
- Attending health education, first aid training or lectures about safety practice.
- Receiving vaccinations against the possible work-related infections.
- Present history of physical and medical complaints.

The investigators observe those street sweepers and garbage collectors

and take pictures for them.

The collected data were then analyzed with Statistical Package for Social Sciences (SPSS) version 13.

RESULTS

Street sweepers and garbage collectors in Beni-Suef city, were found to perform tasks of street sweeping and garbage collection as part of their daily job activities. They worked 8 hours/ shift daily for 6 days, with one day off taken alternatively after arrangements with other groups of workers.

Table 1 shows that the participating workers were males and their ages ranged between 20 ~ 59 years with a mean age of 34.3 ± 9.7 years. Ten % of the workers were illiterate and 24.3% of them could read and write or had finished their primary schools, while 65.7% continued attending schools till the level of basic education. About 76% of the workers were temporary contractors and 24.3% were permanently

employed. About 76% the temporary contractors stated that they had never received any medical examination services, whether, pre-employment, periodic or on demand. Besides their street sweeping jobs, about one third (32.9%) of the interviewed workers reported having part-time jobs that were related to preparing or selling foods, while 65.7% had other jobs that were not related to foods and 1.4% had no additional job.

Table 2, indicates that 20% of workers reported that during the past year they have experienced an injury, infection or disease that can be ascribed as occupational and attributed to their job of street sweeping and garbage collection more than one time. Regarding attending any institutional training programs for work safety, health education or first aid measures, all the workers reported that the institute did not organize such programs to attend. Moreover, none of the workers was

seen using any protective equipment and 75% of them reported that they have not received any protective devices from their institute. All the workers confirmed that they have not received vaccinations against any of the possible job-related infections.

Table 3 shows the relation between age/ education of studied sample and their practices. During work time; 53 (75.7%) from the total sample never use suit and shoes, while only 17 (24.3%) some times used it. Eleven from them were from 40->50, and 6 were from 50-> 60 years of age, ($\chi^2= 70$, and $P=0.000$). The workers find protective clothes not suitable and all of them knew the seriousness of keeping work clothes in house. After finishing their work & before going to another one, 52.9% from the workers washed hands. These were distributed as 15,12,7, & 3 persons in the ages >30 , >40, >50 and >60, respectively. Twenty six workers from them

ended basic educations (primary and preparatory). Additionally, 17.1% from the workers changed working clothes. They were 6, 3, 2 and 1 persons in the ages >30, >40, >50 and >60, respectively. Also, 19 persons changed clothes and washed hands as well. Ten persons from them were less than 30 years of age ($\chi^2= 24.397$, $P=0.018$), and 8 workers from them ended the educations (primary and preparatory).

Table 4 indicates that most of the workers were aware, but not completely, about occupational diseases/ hazards and dangers related to sweeping. They were also aware about the types of diseases that they may get from their job, among which they mentioned; respiratory, nasal, eye and skin allergies and diseases, diarrhea, infections as well as work-related injuries. However, their attitudes towards preventing or avoiding occupational hazards and risks of street sweeping and garbage collection

were not matching with their knowledge.

Table 5 shows that 8 workers (11.4%) left unclean hospital wastes in the street, while the others (88.6%) collected it with rubbish. Table 6 indicates that 15 (21.42%) of the workers changed their working clothes outside their own houses, only 4(9.12%) of them practiced jobs related to food.

DISCUSSION

Poor sanitation is a multidimensional problem that comprises a wide variety of infrastructural and daily human activities including improper waste disposal. In developing countries, the wastes and refuse still comprise a major public health threat; and many of the health problems experienced by residents of different communities are traceable to the poor sanitary environment.⁽⁸⁾

In Beni-Suef city, since there are no designated areas for waste collection, some households bring their mixed wastes

to the garbage collectors when they knock their doors. Others leave their wastes in a container or plastic bags in front of their apartments. Some may put their garbage on the road side or a street corner, which is not usually a designated pick-up point. Stray animals or some scavengers may happen to scatter such wastes to the streets while searching for something to eat or recyclable items. Moreover, due to the lack of garbage bins in streets with people's mal-behavior towards their environment, lots of wastes from people's daily activities are being disposed on streets, e.g., biscuits wrappers, nuts' crusts, cigarettes, tissues, papers, foods, etc.

Collecting house wastes and cleaning streets is consequently, done by street sweepers and garbage collectors who are considered by the people and government as responsible for this task.

Maintaining the health and hygiene of the community is therefore, the role of

street sweepers and garbage collectors who work at risky environments that expose them to morbid conditions including diseases of the eyes and respiratory system, injuries, diarrheal diseases, skin infections, allergies,...etc.⁽⁹⁻¹³⁾

Industrialized countries have significantly reduced the environmental and occupational health impacts on street sweepers and garbage collectors by applying standardized waste management processes. However, in Egypt as well as in other developing countries, the traditional cultures still categorize street sweeping and garbage collection as a filthy and stumpy occupation. Being ranked as such, those workers are usually having lower self-esteem; and the medical problems, which can be caused by the little protective measures they take against their work-related hazardous exposures are further complicated or aggravated by various socioeconomic factors such as poverty,

illiteracy or inadequate education, poor diet, and poor housing conditions.⁽⁷⁾

The present study was performed to assess the awareness and attitudes of street sweepers and garbage collectors regarding the risks and occupational hazards they are exposed to while performing their daily work activities.

Results indicated that all street sweepers and garbage collectors (100%) were aware of the health hazards they are exposed to, such as volatile organic matters or dust inhalations, contact with dangerous substances, infections, injuries, toxins and microorganisms. Nevertheless, a 100% of them reported that they sweep streets and collect garbage directly with unprotected hands without using any gloves, head covers or masks; and the temporary contractors (75%) said that their administration did not provide them any special clothes, work shoes or personal protective equipment (Table 2).

Therefore, it was clear that the workers' attitudes towards taking preventive measures while working do not match their knowledge about their job-related health hazards. For example, they were aware of the different hazards they are exposed to, but all of them (100%) never use protective gloves, masks, shoes or head covers. They excused non-usage of protective measures by saying that their administration did not offer any and they think it is also, not suitable to use while working since it limits working abilities (Tables 2,3). Though health education and personal protective equipment are the most widely used preventive measures against work-related risks.⁽¹⁴⁾

More than three-quarters of the workers returned home while wearing the same clothes, which they wore during street sweeping. Most of the workers do not refrain from eating, drinking or smoking during their work shifts; and a considerable

percentage of them do not seriously clean their hands before taking food or smoking or even after finishing work (Table 3). Such poor-hygienic attitudes and practices are augmenting the risks and hazards to which these street sweepers and garbage collectors are exposed.

Regarding immunization, all workers (100%) reported that they have not received any vaccination against the common infectious diseases; and they wish to receive vaccines and be immunized and protected against infections. However, their administration told them that the institute is not responsible for any payment for vaccination; and if any worker wants to be vaccinated, he has to visit the hospital and pay the vaccinations costs by himself. Being poor and unable to pay for those vaccines, none of the workers (100%) was immunized against the possible infectious diseases that may be encountered from their work environment, such as hepatitis B

or C, tuberculosis or tetanus, etc.

Regarding training courses for work-related safety, health education or workshops on occupational hazards control and prevention, the workers' answers were all negative. None of the workers reported receiving any training for work-related emergencies, first aid, safety or preventive measures. They complained that their institute administration had never afforded their pre-placement orientations, pre- or in-service training, health education or work safety lectures to explain methods for infection control or self-protection.

All the workers (100%) agreed and expressed their willingness to classify garbage at the source in separate colored bags. However, all of them reported that they do not separate it themselves. They owed non-separation of garbage by themselves to reasons such as; their administration did not instruct them to do so. They argued that if they try to make

garbage separations at the source, everything will be mixed up again in the garbage collection end-points; therefore, they do not want to exert efforts to separate and classify garbage while they are sure that it will eventually go in vain at the main collection areas. The real problem of non-separation of garbage is that it is usually undefined garbage which can include wastes of the nearby small hospitals or clinics, syringes, waste medicines "in all its powder, soluble, inhalers, topical, injection forms", as well as patients' biological wastes. Such practices would eventually maximize the hazardous exposure and effects on garbage collectors' health.

Because of the low payment from their institutes, street sweepers and garbage collectors usually try to find an additional source of earnings to improve their socioeconomic conditions by having other part-time jobs. They never care or think

whether, their part-time jobs are related to food or not, in addition to their apparent carelessness in cleaning hands after finishing their street sweeping work.

This study indicates that Egyptian street sweepers and garbage collectors are a working group that needs to be considered and cared about by occupational health professionals. This care can include officially orienting them about their job-related health risks and providing health education, preventive and safety consultations to the workers as well as their institutes.

Egypt's occupational health challenges must include preventing harm and extending occupational health services to those workers, improving measures of their safety and health and monitoring actions taken to achieve this goal.

This study brought up some messages to be delivered to the administration of street sweeping and garbage collection

institute. It is important to value those workers and the work they do, including cleaning which is an essential task that exposes them to particular hazards and risks. These should be assessed and preventive measures should be implemented. The administration should also share health and safety information with workers and regional occupational health authorities. Additionally they have to take measures to ensure that workers are appropriately trained by offering them considerable pre and in-service training, health education, and communicate the risks and hazards with them.

CONCLUSION

We conclude that this working group of street sweepers and garbage collectors should be treated as a vulnerable group that needs a special care. This care can be summarized as providing them pre-placement and in-service orientations about their tasks and health education

about the health hazards they are being exposed to while emphasizing the preventive measures to improve their attitudes and practices. Immunization against tetanus, typhoid and hepatitis B and C viral infections should be provided by their institutes and checked by local occupational health authorities. Guidelines for safety measures and controlling infections should be emphasized and employed for those workers, while offering periodic medical examinations and supplying them with personal protective equipment.

Table 1 Distribution of the personal demographic data of the street sweeping and garbage collection workers (n. = 70 workers)

Variable	Number	%
- Age		
20~29	31	44.3
30~39	22	31.4
40~49	11	15.7
50~59	06	8.6
- Residence		
Urban area	17	24.3
Rural area	53	75.7
- Smoking		
Yes	70	100%
No	00	00
- Education level		
Illiterate	7	10.0
Read and write	17	24.3
Basic Education	46	65.7
- Marital status		
Single	11	15.7
Married	59	84.3
- Type of employment		
Permanent employed	17	24.3
Temporary hired	53	75.7
- Medical examination		
Received on being sick	17	24.3
Never received	53	75.7
- Having part-time jobs		
Job related to food	23	32.9
Job not related to food	46	65.7
No other job	1	1.4

n=70 workers.

Table 2 Distribution of street sweeping and garbage collection workers according to their answers related to health hazards and its prevention.

Variable	Number	%
-Number of times the worker acquired any health problem		
Never	41	58.6
Once through working life	15	21.4
More than one time	14	20.0
-Attending training programs for safety & health		
Attended	00	000
Never attended	70	100
-Attending training programs for first aid measures		
Attended	00	000
Never attended	70	100
- Personal protective equipment "mask, gloves or over head"		
Used	00	000
Never Used	70	100
- Personal protective equipment		
Received from institute	17.5	25
lvot reccieved from institute	52.5	75
- Receiving vaccinations against job infectious hazards		
Yes	00	000
Never	70	100

Table 3 Relations between age / education of street sweeping and garbage collection workers and their practices.

Practice	Number	%	Age distribution (years)			
			40- >50	50- >60		
-During work Time						
Suit and shoes	17	24.3	11	6		
Some times used	53	75.5	-	-		
Not used						
χ^2 (P)	70 (0.00)					
-protective clothes						
Suitable	-	-	-	-		
Not suitable	70	100.0	-	-		
-keeping working Clothes in house						
serious	-	-	-	-		
Not serious	70	100.0	-	-		
			Age distribution (years)			
			>30	>40	>50	>60
-Hands						
Washed	37 ⁺	52.9	15	12	7	3
Not washed	33	47.1	-	-	-	-
-Clothes						
changed	-	17.1	6	3	2	1
Not changed	-	-	-	-	-	-
Changed and hands washed	19 ⁺⁺	27.1	10	-	-	-
χ^2 (P)	24.397 (0.018*)					

significant at $P < 0.05$

⁺26 workers from them ended basic education (Primary and preparatory).

⁺⁺8 workers from them ended basic education (Primary and preparatory).

Table 4 Awareness of work-related risks and health hazards among street sweepers and garbage collectors.

Health hazard	Frequency of mentioning	%
Respiratory problems	66	94.3
Nasal allergy	62	88.6
Skin allergies	55	78.6
Eye problems	60	85.7
Diarrhea diseases	44	62.9
Typhoid fever	11	15.7
Hepatitis (B or C)	49	70.0
Tetanus	41	58.6
Wounds or injuries	70	100.0
Muscular hazards	68	97.1

Table 5 Behaviour of street sweeping and garbage collectors. Towards used and unclean hospital wastes and towards.

Behaviour towards	Worker's education level [Number (%)]				Total (n=70)
	Illiterate (n=7)	Read & write (n=17)	Primary (n=30)	Preparatory (n=16)	Changing working clothes
- Behaviour					
- collected with rubbish	5 (71.4)	17 (100.0)	28 (93.3)	12 (75.0)	62(88.6)
- left in street	2 (28.6)	0(0.0)	2 (6.7)	4 (25.0)	08(11.9)
χ^2 (P)	7.809 (0.05)				

Table 6 Distribution of street sweepers and garbage collectors having part-time jobs according to changing working clothes.

Behavior towards	Having part-time jobs number (%)			Total (n=70)
	related food (n=44)	not related food (n=25)	No other job (n=1)	
- Changing working clothes				
Changed outside house	04 (09.1)	10 (40)	1 (100)	15 (21.4)
Changed inside house	34 (77.3)	12 (48)	0 (0.0)	46 (65.70)
Not changed	06 (13.6)	3 (12)	0 (0.0)	09 (12.9)

REFERENCES

1. Sabde YD, Zodpey SP A Study of Morbidity Pattern in Street Sweepers: A Cross-sectional Study. *Indian J Community Med*; 2008; **33**: 224.
2. Dutkiewicz J, Bacteria and fungi in organic dust as potential health hazard. *Ann Agric Environ Med*; 1997;4:11–6.
3. Nagaraj C, Shivram C, Jayanthkumar K, Murthy NN, A study of morbidity and mortality profile of sweepers working under Bangalore City Corporation. *Indian J Occup Environ Med*; 2004; **8**: 11–6.
4. Krajewski JA, Tarkowski S, Cyprowski M, Szarapinska-Kwaszewska J, Dudkiewicz B, Occupational exposure to organic dust associated with municipal waste collection and management. *Int J Occup Med Environ Health*; 2002; **15**: 289–301.
5. Yogesh SD, Zodpey SP, Respiratory morbidity among street sweepers working at Hanumannagar Zone of Nagpur Municipal Corporation, Maharashtra. *Indian J Public Health*; 2008; 52: 147-9.
6. Da Silveira EA, Robazzi ML, Luis MA, Street cleaners: occupational accidents in the city of Ribeirão Preto, State of São Paulo, Brazil. *Rev Lat Am Enfermagem*. 1998;6:71-9.
7. Dall'Agnol CM, Fernandes Fdos S, Health and self-care among garbage collectors: work experiences in a recyclable garbage cooperative. *Rev Lat Am Enfermagem*. 2007;15:729-35.
8. Bernardo EC, Solid-waste management practices of households in Manila, Philippines. *Ann N Y Acad Sci*. 2008;1140:420-4.
9. Mustajbegović J, Zuskin E, Kern J, Kos B; Respiratory function in street cleaners and garbage collectors. *Arh Hig Rada Toksikol*.1994;45:241-8.
10. Raaschou-Nielsen O, Nielsen ML, Gehl J, Traffic-related air pollution: Exposure and health effects in Copenhagen street cleaners and cemetery workers. *Arch Environ Health*. 1995;50:207–13.
11. Nielsen BH, Würtz H, Holst E, Endotoxin and microorganisms in percolate derived from compostable household waste. *Am J Ind Med*.1994; 25:121-2.
12. Sigsgaard T, Hansen JC, Malmros P, Biomonitoring and work related symptoms among garbage handling workers. *Ann Agric Environ Med*.1997; 4: 107–12.
13. Nku CO, Peters EJ, Eshiet AI, Oku O, Osim EE, Lung function, oxygen saturation and symptoms among street sweepers in calabar-Nigeria. *Niger J Physiol Sci*. 2005;20: 79-84.
14. Mastrangelo G, Perticaroli S, Campio G, Priolo G, Leva A, de Merich D, Marangi G, Fedeli U, Fadda E, Scozzato L, Marchiori L, Working and health conditions and preventive measures in a random sample of 5000 workers in the Veneto Region examined by telephone interview. *Med lav*. 2008;99:9-30.