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Occupational Health and Safety Risks among the Municipal Solid Waste Collectors in Al Leith

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Abstract:

Solid waste collectors are those that pick up garbage for deposit at transfer stations or recyclable materials. Solid waste collectors are laden with health hazards. They are exposed to foul odours, dust, ants, flies and they get dirty easily even when they wear protective clothing if any. This is a descriptive cross-sectional study among conducted Municipal Solid Waste Collectors in Al Leith from October 2016 to May 2017. To explore the work practices, injuries, illnesses, working conditions and other hazards faced solid waste collectors. To determine personal protective devices usage among solid waste collectors. To assess the knowledge, attitude and practices of solid waste collectors towards health and safety a questionnaire was used to collect data solid waste hazards, protective equipment, duration of exposure, and other personal information. Interviews were

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held with the solid waste manager in Al leith municipality. About (39.0%) were not used PPE, Thirty two (64.0%) of the workers are working between the range 2 – 4 years, the high percentage (50.0%) age range was 20 -30 years, 50.0% of solid waste collectors exposure to injuries. The study concluded that Solid waste collectors in Al leith municipality experienced different types of preventable hazards inherent in their jobs due to their work practice .56.0% of the workers suffering from injures, Qualitative data revealed that not all the workers 30.0% were given the protective, 30.0% of the worker do not take training or health education programs on solid waste hazard. Training and health education programs should be provided to all workers from the start of work. Workers in the two factories should be given adequate instruction and training at the start of their employment to enable them to use PPE effectively.

Key words: solid waste, occupational health, worker, hazard

1. INTRODUCTION

Refuse collection is a hazard-laden job. Such hazards include injuries from sharp objects such as broken glasses, serrated edges of tin cans, knives protruding as bags are lifted or swung and hypodermic needles. These needles might be carrying other people's blood possibly contaminated with a number of viruses (Kuijer and Frings-Dresen, 2004). Street sweeping and waste collecting exposes these workers to a variety of risk factors such as dust, bioaerosols, volatile organic matter and mechanical stress, which make them susceptible to certain occupational diseases (Dutkiewicz, 1997 ; Krajewska *et al* 2002).

Several studies reported that waste collectors are at high risk for developing disease resulting from exposure to various work hazards (Schibye et al 2001; Wouters et al., 2002 and Kuijer et al., 2010). Solid waste collectors are exposed directly and without adequate protection to MSW, they are more susceptible to occupational hazards (Sarkar., 2003).

According to a research done on health risk reduction behaviors, model scavengers exposed to solid waste in Thailand, most solid waste collectors had low level of knowledge and alertness on occupational health risks (Phiman E 2011). Despite the severity of occupational health hazards encounter by solid waste collectors their provision and usage of PPE is low. A study done in Colombo municipal council workers revealed that, gloves and boots were available for 44.0% of solid waste collectors and the usage is only 25.0% (Mudalige OM and Dharmathilake AD 2000).

Solid waste collectors are also referred to as garbage collectors or trash collectors. These all refer to those that use trucks to collect garbage to the final point of disposal or recycling on various routes as assigned. The duties of solid waste collectors include emptying of refuse bins into the truck using hydraulic lift or their physical strength and describing the standards for proper disposal to customers (California occupational Guide, 2002).

Solid waste collection is a global event as refuse generation can not be separated from man. Collection methods range from bags made of either plastic or paper, bins, drums, two wheeled or four wheeled containers (Poulsen and Breum, 1995). The job of solid waste collection involves frequent lifting, carrying, pushing or pulling of heavy objects. Frings-Dresen, Kemper, Stassen, et al (1995) Kuijer, Frings-Dresen, De Looze, et al (2000) posited that a closed refuse truck with an automatic lifting device to empty two-wheeled containers or four wheeled containers are used in the Netherlands. The only exceptional cases are those parts of Netherlands within the city areas where households have no space to place a container are bags collected (Kemper, Van Aalat, Lee water et al 1990).

The solid waste collectors tag containers to indicate overflowing containers or rejection of unsuitable wastes to members of the public. The vehicles used in collecting refuse in

ideal situations are in various shapes and sizes to suit the volume of rubbish to be collected at a particular instance. The choice of vehicles is also informed by the different types of roads and streets involved in refuse collection. Most of the streets might be narrow and fully parked with vehicles. This demands daily checking of the vehicles before leaving the depot to make sure they are in good working condition. The pressure to drive the trucks with minor faults will always be there but this should be resisted. This is crucial because someone's life may definitely be at stake (California occupational Guide 2002).

Solid waste collection is often taken for granted in modern societies. Members of the public exhibit non-chalant attitude towards the way they put out their refuse (Kuijer and Frings-Dresen 2004).

Solid waste collectors are exposed to increasing risk of respiratory and gastrointestinal tract diseases. These are attributed to the microbial agents they are exposed to in the course of discharging their duties (Wouters, Hihorst, Kleppe, et al 2002, Heldal, Halstensen, Thorn, et al 2003, Ivens, Ebbehoj, Poulsen, et al 1997, Ivens, Breum, Ebbehoj et al 1999).

Violence from members of the public is another form of hazard. This might be as a reaction to the refuse trucks blocking the roads. The violence could be demonstrated in various ways from verbal abuse to spitting and even physical violence in most cases. They are also subjected to hazard of hearing and musculoskeletal disorders which has to do with back, shoulder and arm injuries. Incorrect manual handling, size of the bin and the distance they have to move the bins predispose to the injuries (Wouters, Hihorst, Kleppe, et al 2002, Heldal, Halstensen, Thorn, *et al* 2003) Ivens, Ebbehoj, Poulsen, *et al* 1997, Ivens, Breum, Ebbehoj *et al* 1999).

The nature of duties involved in refuse collection requires the use of protective equipment. They work in busy roads and carry heavy loads. The protective equipment they

require range from "toetector" footwear, nose masks, high visibility clothing capable of being seen by car drivers from a reasonable distance, gloves, the right wear suitable for rain, heat or cold and reinforced trousers to minimize against punctured wounds from sharp objects. The protective equipment should be suitable to the tasks. Where possible the personal protective equipment should be tried out before general use (California Occupational Guide 2002).

Risk assessments should be carried out to identify the hazards that are involved and also look towards eliminating or reducing the risk to a level as low as possible. This calls for the involvement of the operatives and safety representatives (Kuijer and Frings-Dresen 2004).

2. MATERIALS AND METHODS

The sample for the study constituted of two hundred and seventy nine; (50) solid waste collectors selected through convenient sampling technique. Data for the study was collected through structured questionnaire among solid waste collectors workers to collect data such as solid waste hazards, protective equipment, duration of exposure, and other personal information. Interviews were held with the solid waste manager in Al leith municipality. The information collected were coded and entered into Dell Inspiron 15R computer. Statistical analysis was performed with the aid of computer package SPSS Version 21. Data were analyzed to determine of frequency counts, percentages and tables.

3. RESULTS AND DISCUSSION

Table (1): Socio-demographic characteristics of the solid waste collectors in Al leith municipality, Al leith, Saudi Arabia 2017 (N=50).

Characteristics	Frequency	Percent %
Age (years)		
20 – 30	25	50.0
31 – 40	15	30.0
41 - 50	10	20.0
Gender		
Male	50	100
Female	0	0.0
Social status		
Married	31	62.0
Not married	19	38.0
Nationality		
Bangladesh	26	52.0
Indian	19	38.0
Pakistan	3	6.0
Nibal	2	4.0
Work shift		
Morning	15	30.0
Night	11	22.0
Together	24	48.0

Figure (1): The use of Personal Protective Equipment (PPE) among solid waste collectors in Al leith municipality, Al leith, Saudi Arabia 2017 (N=50).

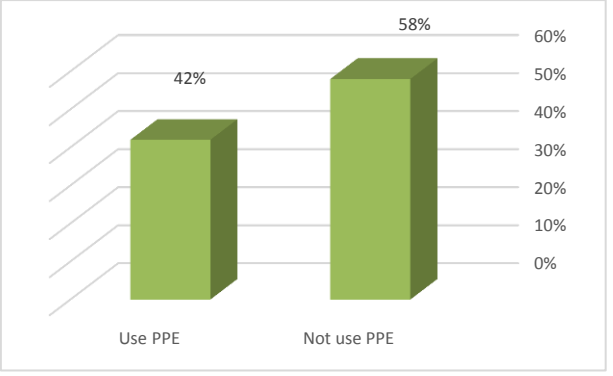


Figure (2): Training on Solid waste hazard among solid waste collectors in Al leith municipality, Al leith, Saudi Arabia 2017 (N=50).

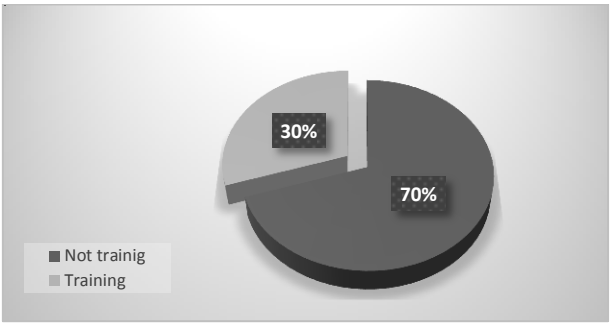


Figure (3): Solid waste collectors responses on injuries in Al leith municipality, Al leith, Saudi Arabia 2017 (N=50).

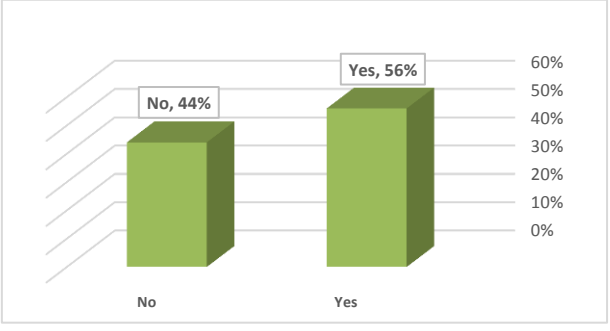
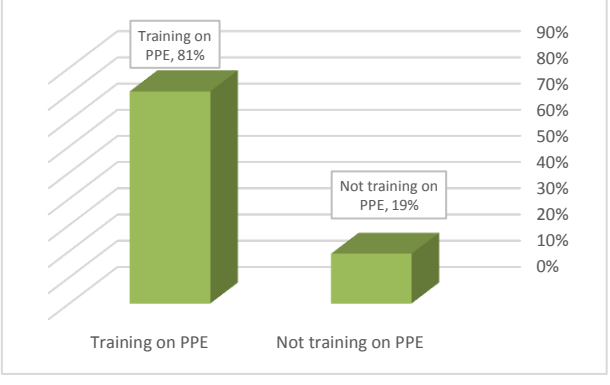


Figure (4): Training on Personal Protective Equipment (PPE) among solid waste collectors in Al leith municipality, Al leith, Saudi Arabia 2017 (N=50).



One hundred and eighty questionnaires were prepared and about 50 were collected and analyzed giving a response rate of 27.8%. The response rate of this study was not similar with studies like 97.9% (Bogale 2012), 92% (Mehrdad R, Majilessi-Nasr M et al. 2008) and 95% (Ahmed 2004). Majority of the respondents were aged between 20 - 30 years (50.0%), followed by ages 31 - 40 (30.0%), the age range of 41- 50 years (20.0%).
Wearing Personal Protective Equipment (PPE) among Al leith solid waste collectors was higher than previous studies done in Addis Ababa 39% (Bogale 2012) and 37.6% (Tadesse G March 2007). This might be due to supplying PPEs for waste collectors. A study done in Hebron and Bethlehem reveals that most of the solid waste collectors did not use PPE i.e. 98.6% of them do not use face mask; 78.9% do not use rubber boot; 45% do not use protective gloves; and 85.5% do not use over all protective materials (Ahmed 2004). A study done in Addis Ababa revealed that, only 43.6% of the solid waste collectors were using PPE while they are on duty and of these, only 22.5% of them reported as not using it consistently while they are on duty. Not having access (83.7%), discomfort (25.6%) and to save time (12.8%) were the main reasons mentioned by them for not using the PPE (Bogale 2012).

The percentage of waste handlers who had received training before engaging to this line of work in this study was 70% which is greater when compared with other studies 6% (Tadesse G March 2007) and a research done in Addis Ababa revealed that, only 20.8% of the solid waste collectors had training before starting the waste collection job (Bogale 2012).

Workers having satisfactory level of knowledge about the hazards associated with their work in the present study (56%) were much higher than the carpenters studied by Bolaji in Nigeria (15.4%) (Bolaji, 2005). This difference might be due to 70% workers received training on solid waste hazard. Further, work-related injuries during the past year, were

reported in 56% solid waste collectors were highly exposed to occupational accidents because of the nature of their work which oblige them to work in the open environment (Da Silveira et al., 1998). Which might be explained by the direct contact with wastes while using no protective devices. A research done in Addis Ababa revealed that only 43.6% of the solid waste collectors were using personal protective equipment (PPE) all the time while they were on duty which might result in increasing the probability of occupational health risks (Bogale 2012). A study done in Port Hartcourt Metropolis in Nigeria about the attitude of solid waste collectors towards safe occupational practice revealed that, 76.3% agreed that they had sustained injuries from sharp objects in the course of packing refuse with bare hands and 26.2% agreed that their PPE were of the right quality and suitable to the task (Inyang M 2009).

SUMMARY AND RECOMMENDATIONS

The result of this study revealed that the magnitude of safe occupational health practice among solid waste collectors was very low while the overall level of knowledge and attitudes were high/moderate. The variables which had significant influence on the practice of workers about occupational health hazards were years of education, received training about the job-associated hazards and duration of work and job satisfaction. These variables should be taken into consideration in any program addressing occupational health and safety issues.

Al leith solid waste management office should provide occupational health and safety training on occupational health and safety to reach full coverage. Policy makers should enforce training occupational health and safety before engaging to waste collection job for every waste collector. We conclude that this working group of solid waste collectors should be treated as a vulnerable group that needs a special care.

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