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LEVEL OF AWARENESS AND FACTORS ASSOCIATED WITH EXPOSURE TO OCCUPATIONAL HEALTH HAZARDS AMONG STREET CLEANERS IN ELDORET TOWN, UASIN GISHU COUNTY

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ABSTRACT

**Objective:** Street cleaners are unprotected from a range of health hazards in their day-to-day activities of removing harmful pollutants from the streets. The main aim of this study was to assess the level of awareness and factors associated with exposure to occupational health hazards among street cleaners in Eldoret Town, Uasin Gishu County.

**Setting:** The study was conducted in Eldoret town, Uasin Gishu County.

**Design:** The study adopted a cross sectional survey research design.

**Participants:** The study's participants were street cleaners. Since the target population was small, census design was adopted. Data were collected using questionnaires. Data analysis was done using both descriptive and inferential statistics.

**Results:** The study targeted 70 street workers who all of them participated in the study. This gave a response rate of 100%. Study results revealed that 55(78.6%) of the respondents were exposed to health hazards daily. Further, majority 52(74.3%) of street cleaners were not aware of administrative procedures regarding the management of hazard exposure. In addition, 55(78.5%) of street cleaners are not aware of well-developed preventive maintenance programs. The main factor associated with exposure to hazards is level of education ( $\chi^2=21.417$ ,  $df=8$ ,  $p=0.000$ ).

**Conclusions:** The study concluded that the level of awareness on health hazards and prevention measures among street cleaners in Eldoret town, was low. The level of education is associated with exposure to these health hazards. There is need for training of cleaners on the personal protective equipment usage and its importance so as to promote awareness and reduce occupational hazards.

## INTRODUCTION

Lack of proper sanitation is a broad-based challenge that consists of different infrastructural and day-to-day routines such as improper waste disposal throughout the world [1]. In third world countries, these wastes are a major public health threat; and most of the health issues experienced by the local residents are attributed to the low level of cleanliness in the surrounding environment [2].

Despite street cleaning practice being associated with health hazards, it is ranked among the oldest practices used by governments to provide a clean environment within the urban set ups [3]. For street cleaners, work related safety and health hazards are the main public health threats globally and are under-researched especially in developing countries [4]. Street cleaners play a major role to keep towns and cities clean. Their services are essential to urban population. Their duties include getting solid wastes from streets, cleaning debris, proper disposal and recycling waste material [5].

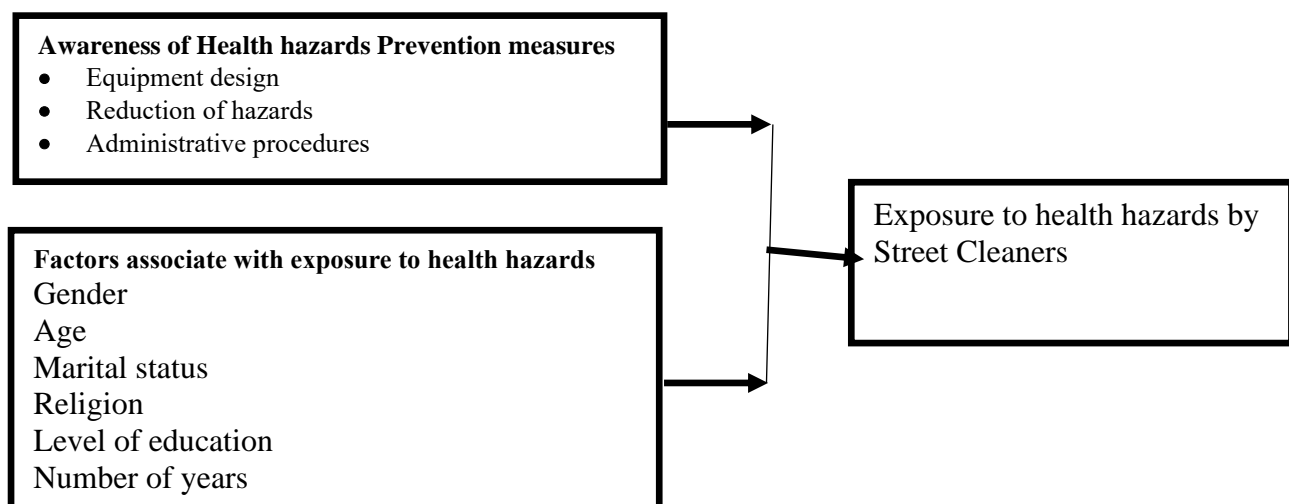
There are approximately 2.9 billion street cleaners globally, who are unprotected from unhealthy work environment at their work [6]. In developing countries, it is estimated that 1.2 million workers die due to work related injuries each year of which 335,000 results from occupational injuries and the rest work related illness. Developed economies have managed to minimize occupational health effects on street cleaners significantly by implementing

standardized waste disposal and management systems [7]. However, this is a challenge in upcoming economies such as Kenya, because health-related issues pertaining proper waste management is yet to be addressed [8].

Similarly, in developing economies, limited research has been conducted for instance in Tanzania (2008) and Nigeria (2005) they found that the main health risk included, inhalation of dust particles leads to lung disorders leading to respiratory health symptoms. While in Kenya street cleaners were not spared, they faced the same health hazards.

Street cleaners are not protected from a range of health threats in their workspaces such as dirt, dangerous organic wastes, bio-aerosols and mechanical pressure that cause them to develop bound disease [9]. As this occupation is concerned with different waste products from households and businesses operation in towns, cleaners interact with several threats that endanger their health [10].

Despite the above generally known health hazard, street cleaners have been largely ignored with little or no information on their safety. Furthermore, no studies have been conducted to provide facts on the occupational health hazards and the associated determinants to exposure among these essential service providers (street cleaners) in Eldoret Town. The main objective of this study was to assess the level of awareness and factors associated with exposure to occupational health hazards among street cleaners in Eldoret town, Uasin Gishu County.



**MATERIALS AND METHODS**

*Study Area:* The study was conducted in Eldoret town, Uasin Gishu County.

*Research Design:* The study adopted a cross sectional research design where both quantitative and qualitative data was collected.

*Target Population:* The study targeted street cleaners in Eldoret town. It is anticipated that this category is exposed to numerous occupational health hazards in carrying out their duties.

*Sample Size calculation:* Census design was employed because of the small size of participants. All the 70 street workers were included in the study.

*Sampling Procedure:* Consecutive sampling was employed. Every other street cleaner was selected into the study

*Research Instruments:* This study utilized questionnaires which were administered to the street cleaner.

*Data Management and Analysis:* Data collected were coded and edited to ensure that it was comprehensive, uniform and accurate through the Statistical Package for Social Science (SPSS) software version 24. Quantitative data collected was analyzed using descriptive and inferential statistics. Descriptive statistics used consisted of frequency, percentages, means and standard deviation. Inferentially data were

analyzed using chi square. Analyzed data were presented in tables.

*Ethical Considerations:* The researcher obtained permission to conduct the research from IREC Kisii University. The respondents were informed about the aim and the nature of the study, all the steps involved, and the expected benefits to the respondents and were required to give their consent to participate. The respondent’s consent to participate in the research were voluntary, and they were free to drop out of the study without any legal consequence. The respondents’ confidentiality and anonymity were protected in all phases of the research.

**RESULTS**

*Demographic Characteristics of the participants*

The study sought to establish whether there was an association between socio-demographic factors and chances of exposure to health Hazards among cleaners in Eldoret town, Uasin Gishu County. Although the self-reported exposure to health hazards was done on an ordinal scale; very low, low, moderate, high and very high, the numbers were small and therefore categories were merged. The merged categories are presented as; Low, moderate and High (see Table 1).

**Table 1**

*Association of Socio-Demographic factors and Exposure to Health Hazards*

Socio demographic	Exposure to Health Hazards			Test statistic
	Low	Moderate	High	
<b>Gender</b>				
Male	8(11.4%)	4(5.7%)	24(34.3%)	$\chi^2 = 0.65, df=8, p=0.95$
Female	9(12.9%)	5(7.1%)	22(31.4%)	
<b>Age</b>				
Below 20years	5(7.2%)	2(2.9%)	10(14.5%)	$\chi^2 =12.4, df=8,$
21-30 years	2(2.4%)	4(5.7%)	5(7.2%)	
31-40 years	5(7.2%)	1(1.4%)	8(11.4%)	

41-50 years	8(11.4%)	2(5.9%)	9(12.8%)	p = 0.190
51 years and above	5(7.2%)	1(1.4%)	3(4.3%)	
<b>Marital status</b>				
Married	9(12.8%)	3(4.3%)	31(44.3%)	$\chi^2 = 1.79$ , df=8, p =0.617
Single	3(4.3%)	3(4.3%)	9(12.8%)	
Widowed/widower	3(4.3%)	1(1.4%)	8(11.4%)	
<b>Religion</b>				
Muslim	7(10%)	2(2.9%)	9(12.8%)	$\chi^2=0.306$ , df=8, p = 0.989
Christian	20(28.5%)	12(17.1%)	20(28.6%)	
<b>Level of education</b>				
None	4(5.7%)	1(1.4%)	3(4.3%)	$\chi^2=21.417$ , df=8, p=0.0008
Primary	3(4.3%)	3(4.3%)	25(35.7%)	
Secondary	9(12.8%)	2(2.9%)	8(11.5%)	
College	2(2.8%)	9(12.9%)	15(15.7%)	
<b>Number of years</b>				
Less than 5 years	7(10%)	4(5.7%)	6(8.6%)	$\chi^2=3.830$ , df=8, p =0.699
5-10 years	12(17.1%)	3(4.3%)	7(10%)	
11-15 years	12(17.1%)	8(11.4%)	4(5.7%)	
Above 16 years	2(2.8%)	3(4.3%)	2(2.8%)	

From the chi square analysis, level of education is significantly ( $\chi^2=21.417$ , df=8, 'p=0.000) is significantly associated with exposure to health hazards. Other socio demographic factors such as gender, age bracket, marital status, religion and period of service were not statistically significant with exposure to health hazards.

#### *Types of Occupational Health Hazards Street Cleaners Are Exposed to In Eldoret Town, Uasin Gishu County*

The study sought to identify the types of occupational health hazards street cleaners are exposed to. The study results are presented in Table 2.

**Table 2**

*Self-Report of Types of Occupational Health Hazards Street Cleaners are exposed to*

Types of occupational health hazards	Frequency	Percentage
Exhaust fumes	13	18.6
Extreme noise	17	24.3
Toxic substances	12	17.1
Dust particles	23	32.9
Injuries	5	7.1
Total	70	100.0

The study findings on Table 2 revealed that there are five major types of occupational health hazards street cleaners are exposed to in Eldoret town, Uasin Gishu County. About

13(18.6%) of respondents noted that exhaust fumes were one of the occupational health hazards they are exposed to. Extreme noise was another occupational health hazards

exposed to street cleaners represented by 17(24.3%) of the respondents. The study further revealed that 12(17.1%) of respondents revealed that toxic substances is exposed to them as health cleaners. Dust particles were also the occupational health hazards exposed street cleaners as shown by 23(32.9%). Lastly the study findings revealed that 5(7.1%) of respondents were exposed to injuries.

*Awareness of Hazards Prevention Measures Among Street Cleaners*

Respondents were asked about their awareness of hazards prevention measures in a Likert’s scale. Table 3 indicates the summary. Key; SA=Strongly Agree, A=Agree, UD=Undecided, D=Disagree, SD=Strongly Disagree, M=mean and Sd= standard deviation

**Table 3**  
*Awareness of Hazards Prevention Measures Among Street Cleaners*

Statements		SA	A	UD	D	SD	M	Sd
We are aware that there is need for provision of personal protective equipment	F	7	8	4	45	7	3.43	1.14
	%	10	11.4	4.3	64.3	10		
We are aware that there are administrative procedures regarding the management of hazard exposure and recovery periods and the management of work patterns and methods as part of the preventive measures	F	5	30	1	32	2	2.94	1.141
	%	7.1	42.9	1.4	45.7	2.9		
We are aware that there are well developed preventive maintenance programs in order to avoid failures that could result in a hazard to street cleaners	F	3	6	6	47	8	3.73	0.931
	%	4.3	8.6	8.6	67.1	11.4		
We are aware that there should be a work plan in place that allows rotation of street cleaners so as to prevent us from being exposed to the same hazards for a long period	F	1	7	3	42	17	3.96	0.908
	%	1.4	10	4.3	60	24.3		
We are aware that there should be a planned regular medical check-up for us to reduce the effect of hazards exposures	F	4	4	1	49	12	3.87	0.962
	%	5.7	5.7	1.4	70	17.1		
We are aware that the desire for more work flexibility is also a reaction to the rigors of working for globally distributed cleaning companies	F	12	2	0	46	10	3.77	0.904
	%	17.1	2.9	0	65.7	14.3		
We are aware that our employers are already legally required to offer flexible	F	26	35	2	5	2	1.89	0.971

hours to us to reduce the exposure to hazards	%	37.1	50	2.9	7.1	2.9		
We are aware that we need to look for jobs that give us the flexibility to allocate our work hours	F	19	31	0	19	1	2.31	1.186
	%	27.1	44.3	0.0	27.1	1.4		
We are aware that older workers have difficulty hearing a particular voice or sound in a noisy environment	F	5	6	1	43	15	3.81	1.094
	%	7.1	8.6	1.4	61.4	21.4		
We are aware that protection techniques make it possible to counter a hazardous occurrence or diminish the scope of potential damage	F	23	39	3	3	2	1.89	0.893
	%	32.9	55.7	4.3	4.3	2.9		
Total number of respondents		70					3.16	

Key; F= Frequency, SA=Strongly Agree, A=Agree, UD=Undecided, D=Disagree, SD=Strongly Disagree, M=mean and Sd= standard deviation.

The study findings in Table 3 indicates that the ten items on awareness of hazards prevention measures among street cleaners had means of between 1.89 and 3.96 with standard deviation figures of between 0.893 and 0.908. This implied that respondents were fairly aware of hazards prevention measures among street cleaners.

*Common causes of exposure to Health Hazards and factors associated with Exposure to Occupational Health Hazards Among Street Cleaners in Eldoret Town, Uasin Gishu County.*

The self-reported common causes of exposure to occupational health hazards among street cleaners in Eldoret town, Uasin Gishu County are reported in Table 4.

**Table 4**  
Common Causes of Exposure to Occupational Health Hazards Among Street Cleaners

Statements		SA	A	UD	D	SD	M	Sd
Employees are provided with personal protection equipment (PPE) to reduce exposure	F	2	16	5	45	2	3.41	0.970
	%	2.9	22.9	7.1	64.3	2.9		
Cleaners are exposed to chemicals from the industry	F	3	37	6	19	5	2.80	1.111
	%	4.3	52.9	8.6	27.1	7.1		
The chemicals contained in some cleaning agents which are flammable are source of occupational health hazards	F	7	11	41	6	1	3.41	1.160
	%	10	15.7	58.6	8.6	1.4		
Street cleaners are exposed to blood-borne pathogens where they may come in contact with contaminated needles	F	17	38	4	6	5	2.20	1.124
	%	24.3	54.3	5.7	8.6	7.1		
Poor ergonomics of work equipment are exposing street cleaners to occupational health hazards	F	14	42	0	10	4	2.26	1.112
	%	20	60	0.0	14.3	5.7		
	F	30	23	0	11	6	2.14	1.354

The use of vibrating equipment can reinforce negative effects of physical strain such as awkward postures to street cleaners	%	42.9	32.9	0.0	16.7	8.6		
Some cleaning machines produce noise levels that contribute to generating stress among street cleaners	F	30	23	0	11	6	1.99	0.999
	%	42.9	32.9	0.0	15.7	8.6		
Incorrect use of some cleaning products may create unexpected chemical reactions and release dangerous substances	F	22	37	4	4	3	1.97	1.102
	%	31.4	29	5.7	5.7	4.3		
Some chemicals may for instance cause breathing problems if over sprayed, used without adequate ventilation	F	28	29	2	9	2	2.19	1.133
	%	40	41.4	2.9	12.9	2.9		
Physical hazards are the most health hazards Street cleaners are exposed to	F	20	33	4	10	3	2.09	1.045
	%	28.6	47.1	5.7	14.3	4.3		
Total number of respondents		70						

Key; F= Frequency, SA=Strongly Agree, A=Agree, UD=Undecided, D=Disagree, SD=Strongly Disagree, M=mean and Sd= standard deviation.

Table 4 indicates that respondents the ten items on common causes of exposure to occupational health hazards among street cleaners had means of between 1.97 and 3.41 with standard deviation figures of between 1.102 and 0.970. This implied that respondents are exposed to occupational health hazards among street cleaners.

## DISCUSSION

### *Types of Occupational Health Hazards Street Cleaners Are Exposed to In Eldoret Town, Uasin Gishu County*

The study finding revealed that there are five major types of occupational health hazards street cleaners are exposed to in Eldoret town, Uasin Gishu County. These occupational health hazards are exhaust fumes, Extreme noise, toxic, dust particles and injuries.

The study findings concurred with Sabde <sup>[15]</sup> that street cleaners can be exposed to different occupational hazardous substance. These can happen by breathing hazardous substance in, skin contact, swallowing, eye contact and physical injuries present in place of work as dust, powder or waste for example, wood cement, metal.

### *Awareness of Hazards Prevention Measures Among Street Cleaners*

The study findings indicated that majority of street cleaners were not aware of the need to be provided with personal protective equipment. The study findings disagreed with Andrade <sup>[16]</sup> who found out that low PPE compliance persists despite workers' awareness of herbicide exposure risks and as a result of the influence from workers' socio-cultural context, herbicide risk perceptions and working conditions.

Street cleaners we're not aware of administrative procedures regarding the containment of dangerous exposure and recovery periods and the management systems as part of the preventive measures. The study concurred with Van Kampen et al. <sup>[11]</sup> study findings that street cleaners are not aware of different ways to achieve clean streets depending on the availability of equipment, the type and magnitude of dirt, the surface conditions encountered or traffic conditions without exposing themselves to hazards.

They were also not aware of well-developed preventive maintenance programs to avoid failures that could result in a hazard to street cleaners. The study agreed with Okeke et al. <sup>[12]</sup> whose findings noted that employees were not aware on proper use of personal protective equipment and have a workable skin protection routine. The study further revealed

that street cleaners were not aware of need of work plan in place that will allow rotation of them so as to prevent them from being exposed to the same hazards for a long period. Li and Buckle [13] who noted that employees were not aware of Physical exposure to risks for potential work-related musculoskeletal injuries.

Further, on the statement that street cleaners are aware of the need of a planned regular medical check-up for us to reduce the effect of hazards exposures. This implies that that there is a significant association between level of awareness and exposure to health hazards in Eldoret town, Uasin Gishu County. The study findings concur with World Health Organization [14] who found out that when an organization is aware of some chemicals may for instance cause breathing problems if over sprayed, used without adequate ventilation or sprayed onto hot surfaces they will be able to know the effects of its exposure to the environment.

Factors Associated with Exposure to Occupational Health Hazards Among Street Cleaners in Eldoret Town, Uasin Gishu County.

The study findings reveal that there are factors contributing to exposure to occupational health hazards among street cleaners. Employees are not provided with personal protection equipment (PPE) to reduce exposure. The chemicals contained in some cleaning agents are explosive and highly flammable thus exposing the street cleaner to occupational health hazards. Cleaning workers may also encounter blood-borne pathogens, such as nails, sharp objects and needles. The use of vibrating tools can amplify the intensity of negative impacts associated with cleaning equipments.

Level of education was significantly associated with exposure to health hazards. Other socio demographic factors such as gender, age bracket, marital status, religion and period of service were not statistically significant with exposure to health hazards.

The findings concur with Boini et al. [17] who noted that respondents who reported having received occupational safety and health education had two times less workplace injuries than those declaring not having received the education. A lower workplace injuries risk was observed for participants who received the 'first aid at work' training

## CONCLUSION

Street cleaning workers were exposed to five major types of occupational health hazards. These occupational health hazards are exhaust fumes, extreme noise, toxic, dust particles and injuries. The study further concluded that Street cleaners were not aware of administrative procedures regarding the management of hazard exposure and recovery periods and the management of work patterns and methods as part of the preventive measures. Level of education is the main factor associated with exposure to health hazards.

## RECOMMENDATIONS

The study therefore recommends that the government and employers should come up with in-service training to provide the street cleaners with knowledge and awareness on how to reduce health hazards exposures such as exhaust fumes, extreme noise, toxic, dust particles and injuries.

The study recommends that there is need for cleaners training on the personal protective equipment usage and importance so as to promote awareness and reduce occupational hazards.

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