

Preventive health program regarding knowledge and practice of street cleaners about occupational health hazards at Sohag city

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Abstract

Back ground: Street cleaners play important roles in environmental health by keeping roads clean; nonetheless, these workers confront several hazards. The majority of those dangers can be avoidable. **Aim of the study:** for evaluating the effect of Preventive health program regarding knowledge and practice of street cleaners about occupational health hazards at Sohag city. **Research design:** This study applied a quiz-experimental research design. **Setting:** The study was carried out in Sohag Local Council (East and West cities) at Sohag City. **Sample:** A convenience sample of 208 workers who worked at the previously mentioned setting. **Tools: Two tools** were used to collect study data ; **Tool I:** a structured questionnaire was used concerning socio-demographic data of studied, workers' knowledge regarding hazards at workplace and health hazards prevention. **Tool II:** An observational checklist was utilized to assess the street cleaners' safety precautions. **Results:** the majority of the street cleaners were poor knowledge and practice about occupational risk and prevention of health hazard prior implement of the program respectively. However, there was a significant improvement in knowledge and practice of the street cleaners after implementation of the program. **Conclusion:** This study concluded that preventive health program is effective for improving' knowledge and practice of street cleaners. **Recommendations:** The study recommended for further personal protective devices should be available for all street sweeper workers.

Keywords: Preventive health program- street cleaners- occupational health hazards

Introduction:

Occupational health is a multidisciplinary activity that strives to protect and promote workers' health through the prevention and control of occupational diseases and accidents, as well as elimination of occupational factors and conditions that cause risk to health and safety of workers on the job. Occupational health is the promotion and preservation of employees' physical, mental, and social well-being in all occupations through the prevention of health hazards, risk reduction, labor adaptation to people, and employment adaptation to workers (Kasaenasab et al., 2021).

According to World Health Organization and International Labor Organization projects on the global burden of occupational injuries and diseases, more than 2.9 billion employees worldwide are exposed to mechanical, chemical, physical, and mental hazards. Every year, 140,000 to 355,000 people die as a result of workplace injuries. In Egypt in 2020, the

total number of workplace injuries will be 19.7% (Nickles and Conroy, 2020).

A work-related hazard is defined as a risk to a person's health that is caused by their job. It also refers to the process or condition in which workers are exposed to accidents or sickness at work. Unsafe working circumstances and dangerous work activities pose health risks. Yet, there is an unsafe working environment. Workplace dangers and injuries can be avoided by using adequate personal protective equipment (Kalejaiye, 2021).

Street cleaners have a low social status and an inadequate education, and their health is neglected. The most frequent harmful particles in the atmosphere are dust particles. Street sweepers are exposed to a variety of soil, sand, and gravel dust particles, vehicle dust, bioaerosols, and plant particles. Tiny particles accumulate in the lower respiratory tract during pulmonary breathing (Hashemi et al.,2018).

Street sweepers are exposed to a multitude of risks or hazards as a result of the conditions of their work environment, which may result in significant morbidity. The most common occupational hazards in the waste collection and composting sector are heavy manual handling and exposure to bioaerosols. Toxic, irritating, or allergic eye, nose, throat, and respiratory symptoms have been associated to bioaerosol exposure (Poole, and Basu, 2021).

Workers' health impacts from street cleaning are unknown, and there are no uniform restrictions in this industry. Street cleaners, like garbage and compost workers, are physically strained, which can lead to musculoskeletal and respiratory problems. They may get cut injuries, skin irritations, and infections while cleaning public rest rooms or emptying garbage cans. They are exposed to cold, wind, and heat because they operate largely outside. Pollution caused by transportation and the environment as dust, particulate matter, ozone, carbon monoxide and nitrogen oxides (Schantora et al., 2020).

Personal protection equipment is used to protect personnel from hazards at work. Worker placement and retention in an occupational situation that corresponds to his physiologic and psychological features. Better working conditions; social security. When an employee's employment contract expires, their rights are maintained. Personal protective equipment is used to limit the danger to an acceptable level (Salvendy, 2019).

Occupational safety and health Nursing is concerned with the nursing component of comprehensive occupational health care, and it contributes to health promotion, handicapped worker health protection, and occupational health nurses can play an essential role in disease promotion, protection, prevention, and control (Mostafa and Momen, 2019).

Significant of the study:

The working population is mostly ignorant, and they are unaware of the hazards linked with their occupation. It leads to inefficient control measures and law enforcement. As a result, a worker awareness and health prevention program should be implemented that focuses not only on

occupational diseases, but also on smoking, avoiding drinking, eating, and smoking at work (Hassan, et al., 2019).

Despite the fact that numerous studies have been undertaken on the occupational health dangers of street cleaners. Little study has been conducted on the prevention of occupational health hazards among street cleaners. As a result, the researcher chooses to implement this study about preventive health program on knowledge and practice of street cleaners workers regarding prevention of occupational health hazards at Sohag city.

Exposure to work dangers on the street often indicates weak safety standards. Careless handling might result in significant accidents and health concerns. As a result, workers must be warned about safety precautions and health concerns. Studies on street cleaners are seen to be significant in order to reduce danger and improve worker health.

Aims of the study

This study aimed to evaluate the effect of Preventive health program regarding knowledge and practice of street cleaners about occupational health hazards at Sohag City.

Research hypothesis:

H1: Preventive health program will improve level of knowledge of street cleaners' about occupational health hazards.

H2: After the program is implemented, street cleaners' practices for preventing occupational health hazards will be improved.

Subjects and methods:

Research design:

This study used a quiz-experimental research design.

Study Setting:

This study was carried out at Sohag Local Council. It was divided into East and West Sohag cities.

Sample size:

Total coverage 208 street cleaners workers at Sohag Local Council. They were presented as the following table:

Setting	Numbers
West sohag	100
East sohag	108
Pre test	208
Post test	203(four 4 street cleaners were retired and one die after pretest from East sohag)

Subjects:

A convenient sampling was used to achieve the aim of the study. It composed of 208 street cleaners (total coverage) for all street cleaners at Sohag local Council (East and West cities)

The samples were selected based on the following :

Inclusion criteria:

Street cleaner

- Those who are in the age group of 20-60 years..
- Those who are working at Sohag Local Council.
- Those who are having more than one year experience.
- Those who are willing to be participate in the study.

Exclusion criteria:

Street cleaner

- Those who remain chronically absent (more than 6 months).
- Those who are having temporary or part time job.

Study tools:

Two tools were used to collect study data:

I- The first tool:

The researcher created a structured interview sheet based on pertinent literature. There are three components to it :

Part 1: This contained information on socio-demographic characteristics, such as age, sex, place of residence, educational status, marital status, years of professional experience, daily work hours, and courses training.

Part 2: included current worker's suffering health problems and exposed to injuries

during working as respiratory diseases , skin diseases, musculoskeletal diseases, vision diseases, hearing diseases , Laceration, Fracture, Puncture wound.

Part 3: a structured questionnaire with 30 multiple-choice questions about knowledge of occupational health hazards and it's prevention is presented(Ranjani,2012).

Seven sections were added to the questions:

In the first section, there are four questions about occupational hazards as (occupational health, objective of occupational health, different kind of dangers in the workplace, and types of problems in the workplace).

In the second section, there are five questions respiratory health problems and it's prevention as (common respiratory problems effect of street cleaners, causes of respiratory problems, signs and symptoms of respiratory health problems, complications of respiratory health problems and measures protection about respiratory health problems).

The third section includes five questions about on skin problems and it's prevention as (common skin problems among street cleaners, causes of skin problems , sign and symptom of skin problems, complications of skin problems and measures protection from skin problems).

The fourth section includes four questions about gastro intestinal problems and it's prevention as (common gastrointestinal problems among street cleaners, common causes of diarrhea , signs and symptoms of diarrhea and measures protection from diarrhea).

The fifth section asks four questions on eye problems and it's prevention as(common causes of eyes problems , signs and symptoms of eyes problems , complications of eyes problems and measures protection from eyes problems)

The sixth section includes five questions about musculoskeletal problems and it's prevention (as common musculoskeletal problems, Causes of musculoskeletal problems, signs and symptoms of musculoskeletal problems, complications of musculoskeletal problems and measures protection from musculoskeletal problems.)

Seven section includes three questions regarding protective equipment as types

,availability and function and uses of protective equipment

Scoring system: A knowledge scoring system was created and established as (Haddad,2017) for each item. One grade for the right response and 0 for the incorrect one. total marks for the right responses for knowledge and calculate as follows: Poor 50% or less, Fair 50%–70%, and Good 70% or more

II - The second tool was an observational checklist includes:

An observational checklist was used to evaluate the street cleaners' safety. It entails utilizing safety precautions for street cleaners, such as protective clothing such an apron, gloves, shoes, and ear plugs, as well as body mechanics, hand washing before and after work (Abouzeid et al., 2022).

Scoring system According to the designed and established scoring system of practice (Haddad,2017) for each item, one mark was given for using safety precautions and zero for not doing so add up the correct use ratings for practice and calculate as follows: Poor 50% or less, Fair 50%–70%, and Good 70% or more.

Methodology:

I-Administrative phase:

An official letter was issued from the Faculty of Nursing, Sohag University and forwarded to the director of Sohag Local Council to obtain the permission to conduct the study . Then, the purpose of the study and the data schedule were explained.

II-Pilot Study:

Before beginning data collection, a pilot study was conducted on (10%) 20 street cleaners, and the results of this study led to their exclusion from the study's overall sample. This study's objectives were to evaluate the tools' readability and determine how long it would take to complete a form. The necessary alteration was made in accordance with the pilot study's findings.

III-Validity of study tools:

Five specialists of community health nursing department from the Faculty of

Nursing's Sohag University assessed the instrument for clarity, relevance, comprehensiveness, understanding, and applicability before checking and revising it.

Reliability test:

Test-retest reliability was used. The internal consistency of the tools was calculated using Cronbach's alpha coefficients. Study tools revealed reliability at Cronbach's alpha dependability was 0.791, and for practice, it was 8.43.

III- Data collection Phase:

Ethical Consideration:

Each participant in the study was given an explanation of the study's goals by the researchers. Each participant was asked orally for their informed consent to take part in the study, and they were given the assurance that the data collected would be kept private and utilized only for the study's scientific goals.

IV – Data collection:

Field of work

- Data were gathered, an preventive health program was started from the first January through the end of June 2022, and a post-test was finished at the end of October .
- The program has been finished by two hundred eight 208 street cleaners , who were divided into ten 10 groups. Each group contained around (20) street cleaners, who were conducted in the Sohag Local Council.
- Two groups was taken every month.
- Every group was taken eight sessions each month, with one session per day lasting one hour. Sessions took place at Sohag Local Council every Saturday and Monday from 7 a.m. to 8 a.m.
- The researchers designed eight sessions repeated for each group as the following:

First day

- **First session** contains orientation the participants about the program, fill pretest and booklet was distributed to all participants after completing pretest.
- **Second session “unit one”** it includes theoretical part about general aspects of occupational health hazards.

Second day

- **Third session “unit two”** it consists of theoretical part about prevention of respiratory health problems.
- **Fourth session “unit three”** it contains of theoretical part about prevention of skin health problems

Third day

- **Fifth session “unit four”** it includes of theoretical part for prevention of gastro intestinal problems
- **Sixth session “unit five”** it consist of theoretical part about prevention of eye problems

Fourth day

- **Seventh session “unit six”** it includes of the theoretical part about prevention of musculoskeletal problems
- **Eighth session “unit seven”** it contains theoretical and practical parts about personal protective equipment
- **Post test** after 3month of the end implementation educational program for each group and post test has been finished by 203 street cleaners.

Statistical Analysis

Before performing any more statistical analysis, the data were checked using the Anderson-Darling test for normality and for homogeneity variances. Comparatively to continuous variables, which were characterized by the mean and standard deviation (Mean, SD), categorical variables were described by number and percentage (N,%). Categorical variables are compared using the chi-square test and the fisher exact test, whereas continuous variables are compared using the t-test and the ANOVA TEST. Correlation Was Used to Show an Association Between Scores P-value considered statistically significant when $P < 0.05$. The software IBM SPSS 20.0 was used to conduct each and every analysis.

Following were taken into consideration for the observational differences and associations:

- Highly significant (HS) $p < 0.001$

- Significant (S) $p \leq 0.05$
- Not significant (NS) $p > 0.05$

Description of the educational program:

The program has been developed by the researchers based on reviews of relevant literatures. The researchers prepared sessions include simple information about occupational hazards and its types, health problems among workers and prevention of health hazards for workers. Every street cleaner who participated in the pretest received an educational booklet which used as a handout for every workers in pretest.

Program phases:-**A) Assessment:**

Based on pretest assessment of street cleaners workers knowledge about occupational health hazards and it's prevention, so the program sessions, media were prepared to improve workers knowledge and practice and teach them how to deal with hazards.

B) Planning phase:-

The arrangement of conducting the program

The program's sessions and timing were chosen during this phase. During this step, more resources were examined and organized as the teaching place and handout.

Teaching Time:

The researcher visited Sohag local council before working time, from (7 to 8 am).

Teaching place:

The program was conducted in the East and West Sohag local council according to the attendance of all workers.

Teaching methods and materials:

PowerPoint presentations, discussions, lectures, and colorful handouts that was be used.

Implementation phase:

A program orientation was conducted before to the first session, and participants were informed of the time and location of their sessions. A pre-test was administered prior to the start of the educational program to assess

participants' knowledge and practice level in pre test. every session start with a summary of what had been covered in the previous session and an explanation of the objective of the new topics, both of which took into account the workers' level of comprehension and used simple language. The workers were notified of the topic and timing of the following session at the conclusion of each one.

D) Evaluation stage:

Following the implementation and completion of the program, a post-test was administered to workers to assess their knowledge about occupational hazards , prevention of health hazards and practice about prevention of health hazards.

Result:

Table (1) displays the distribution of street cleaners based on their socio-demographic characteristics. It was found that (51.4%) of street cleaner's age between 31-40years old. (83.2%) of them lived in rural areas. All of them male. (35.6%) of them not read and write education. (64.9%)of them were married and (100%) of them hadn't previous courses training.

Table(2): Revealed that (76.9%)of street cleaners were suffered from health problems during working as (25.5%) had respiratory diseases and (24.5%)had musculoskeletal diseases. (81.7%)of street cleaners were exposed to injuries during working as (63.5%) had laceration . (51.9%) of street cleaners were exposed to injuries during working due to Broken bottles.

Table (3): showed that the street cleaners' knowledge about hazards at work and how to prevent them had considerably elevated from the pre-test to the post-test, with a p-value = (<0.001**).

Figure(1): showed that (90.4%) of the street cleaners were poor knowledge in pre-test which developed in post to (91.1% , 6.9%) were fair and good it respectively. Between the pretest and posttest, there is a highly statistically significant difference , indicating that the preventive health program's execution helped the street cleaners' knowledge improve .

Table(4): illustrated that (90.9%)of the street cleaners were poo practice in pre-test which developed in post test to (64% , 19.2%) had fair and good it respectively . There is a very statistically significant difference before the program and after implement it, and the preventive program's execution improved the street cleaners' practices.

Table(5): shows that there is a statistically significant difference between total knowledge levels and Years of experience in the pretest **P=(0.003)** and there is a statistically significant difference between total knowledge levels and Age, residence, education level, marital status, duration of work per day, and system work in the pre and post test **P=(0.000, 0.000, 0.000, 0.001, 0.000 , 0.000, 0.001, 0.001 , 0.000 , 0.000 , 0.019 and 0.016)** respectively.

Table (6) : Shows that the difference between the total practice level and educational level between the pretest and posttest is statistically significant **P=(0.000)**. a statistically significant difference was found between total practice level and residency in the pretest (**P=0.017**), and a statistically significant difference was found between total practice level and age, marital status, and daily job hours in the post test **P=0.004, 0.002, and 0.010** respectively.

Figure (2): demonstrated that There is a very positive association between the street cleaners' overall knowledge and practice scores regarding prevention of occupational hazards in pre-test and post-test **r = (0.476& 0.341) p= (0.000 and 0.000)** respectively.

Table (1): Distribution of the street cleaners according to their Socio-demographic data at Sohag city, 2023.

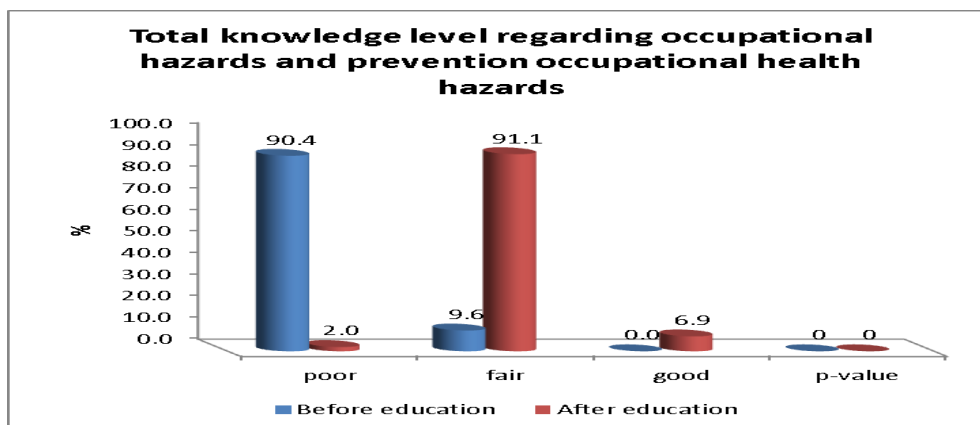
Items(N=208)	No	%
Age		
21-30years old	20	9.6
31-40years old	107	51.4
41-50years old	39	18.8
51-60years old	42	20.2
Residence		
Rural	173	83.2
Urban	35	16.8
Sex		
Male	208	100.0
Education Level		
No read and write	74	35.6
Read and write	68	32.7
Primary education	55	26.4
Preparatory education	11	5.3
Marital status		
Single	35	16.8
Married	135	64.9
Divorce	17	8.2
Widower	21	10.1
Experience year		
1-5years	43	20.7
6-10years	68	32.7
More than 10 years	97	46.6
Duration of work per day		
1-5	12	5.8
6-8	101	48.6
More than 8years	95	45.7
System work		
Morning	92	44.2
After noon	41	19.7
Night	5	2.4
By change	70	33.7
Previous courses		
No	208	100.0

Table(2): Distribution of Street Cleaners, regarding current suffering health problems during working ,Sohag city,2023 N=208.

Items N=208	N	%
Yes	160	76.9
No	48	23.1
Health problems as:		
Respiratory diseases	53	25.5
Skin diseases	30	14.4
Musculoskeletal diseases	53	24.5
Vision diseases	31	14.9
Hearing diseases	4	1.9
Non	39	18.8
Exposed to injuries during working		
Yes	170	81.7
No	38	19.3
Causes of injuries		
Broken bottles	108	51.9
Nail puncture	23	11.1
Road traffic accident	20	9.6
Animal bites	22	10.6
Non	35	16.8
Types of injuries		
Laceration	132	63.5
Fracture	15	7.2
Puncture wound	26	12.5
Non	35	16.8

Table (3):Distribution of Street Cleaners, knowledge about occupational hazards and preventive of health risks Before and after program.

Items	Before program(N=208)	After program(N=203)	P. value
	Mean±SD	Mean±SD	
Occupational health hazards	5.18±2.67	11.45±2.16	<0.001**
Prevention health hazards	16.73±5.91	31.66±4.43	<0.001**
Total score of knowledge	21.91±7.66	42.41±5.85	<0.001**

**Figure (1): Total knowledge level of street cleaners regarding prevention of occupational health hazards before and after program.**

Table(4): Distribution Of street cleaners, practical level regarding personal protective equipment Before and after program.

Items	Before program(N=208)		After program(N=203)		P. value
	No	%	No	%	
Poor	189	90.9	34	16.7	<0.001**
Fair	15	7.2	130	64.0	
Good	4	1.9	39	19.2	
Mean±SD(range)	2.22±1.52(0-7)		5.59±1.11(2-8)		<0.001**

Chi square test for qualitative data between the two groups

- Independent T-test quantitative data between the two groups

***Significant level at P value < 0.01*

Table (5): Relationship between street cleaners' score of knowledge and their socio-demographic characteristics in pre and post test, at Sohag city,2023.

Items	Knowledge score					
	Before program			After program		
	N	Mean±SD	Range	N	Mean±SD	Range
Age						
21-30years old	20	25.9±6.09	15-39	19	42.84±4.15	37-51
31-40years old	107	23.96±7.57	11-40	107	43.72±5.45	35-56
41-50years old	39	19.44±6.11	7-35	39	41.85±6.65	34-63
51-60years old	42	17.1±6.94	2-25	38	39.08±5.6	28-54
Test Used		F=13.24	P=0.000**		F=6.55	P=0.000**
Residence						
Rural	173	20.47±7.09	2-39	168	41.82±5.78	28-63
Urban	35	29.03±6.36	15-40	35	45.26±5.43	36-55
Test Used		T= 43.76	P=0.000**		T= 10.49	P=0.001**
Education Level						
No read and write	74	16.05±4.83	2-28	72	38.39±4.59	28-53
Read and write	68	21.15±6.22	6-35	66	42.09±3.89	36-54
Primary education	55	28.73±4.89	21-37	55	47.31±5.42	38-63
preparatory education	11	32±5.67	24-40	10	46.5±4.58	40-55
Test Used		F=72.01	P=0.000**		F=41.42	P=0.000**
Marital status						
Single	35	26.26±8.93	11-40	35	44.2±6.72	35-56
Married	135	20.95±7.65	2-36	132	41.77±5.43	28-54
Divorce	17	23.59±1.77	19-26	17	46.47±6.66	41-63
Widower	21	19.52±5.51	8-25	19	39.95±3.73	34-46
Test Used		F=5.79	P=0.001**		F=5.87	P=0.001**
Experience year						
1-5years	43	25.37±6.91	10-37	42	43.26±4.73	36-52
6-10years	68	20.78±6.99	2-33	68	41.35±4.86	28-53
More than 10 years	97	21.18±8.05	7-40	93	42.8±6.83	28-63
Test Used		F=5.83	P=0.003**		F=1.77	P=0.173
Duration of work per day						
1-5	12	18.25±7.14	10-31	12	36.17±3.56	28-40
6-8	101	20.09±7.15	2-35	100	41.68±5.96	28-63
More than 8years	95	24.32±7.61	7-40	91	44.03±5.27	36-56
Test Used		F=9.64	P=0.000**		F=12.36	P=0.000**
System work						
Morning	92	21.15±7.45	7-40	90	42.31±6.49	28-63
After noon	41	20.05±6.07	6-27	40	40.95±4.05	35-50
Night	5	19.6±0.55	19-20	5	37.2±1.64	36-39
By change	70	24.17±8.56	2-39	68	43.78±5.69	28-56
Test Used		F=3.40	P=0.019*		F=3.53	P=0.016*

Independent T-test quantitative data between the two groups

- One-way Anova test quantitative data between the Three groups or more

**Significant level at P value < 0.05, **Significant level at P value < 0.05*

Table (6): Relationship between street cleaners' score of practice and their demographic characteristics in pre and post test, at Sohag city,2023.

Items	Practical Score				
	Before program			After program	
	N	Mean±SD	Range	Mean±SD	Range
Age					
21-30years old	19	2.5±2.24	0-6	6.05±1.31	4-7
31-40years old	107	2.26±1.56	0-7	5.76±1.14	3-8
41-50years old	39	2±1.4	0-5	5.28±0.86	3-7
51-60years old	38	2.17±1.06	0-4	5.21±1.02	2-6
Test Used		F=0.54 P=0.654		F=4.58 P=0.004**	
Residence					
Rural	173	2.1±1.46	0-7	5.52±1.08	2-8
Urban	35	2.77±1.66	0-7	5.91±1.22	4-8
Test Used		T=5.78	P=0.017*	T=3.60	P=0.059
Education Level					
No read and write	72	1.43±1.1	0-4	5.04±1	2-7
Read and write	66	2.12±1.36	0-6	6±0.99	3-8
Primary education	55	3.11±1.54	1-7	5.64±1.11	4-7
preparatory education	10	3.64±1.57	2-6	6.6±0.84	6-8
Test Used		F=21.00 P=0.000**		F=13.73 P=0.000**	
marital status					
Single	35	2.34±2.38	0-7	5.91±1.31	3-8
Married	132	2.09±1.36	0-6	5.41±1.08	2-7
Divorce	17	2.59±1.12	1-5	6.35±1.06	5-8
Widower	19	2.52±0.68	2-4	5.58±0.51	5-6
Test Used		F=1.03 P=0.380		F=5.09 P=0.002**	
Experience year					
1-5years	42	1.98±1.61	0-6	5.52±1.15	4-7
6-10years	68	2.22±1.71	0-7	5.74±0.99	4-8
More than 10 years	93	2.32±1.32	0-6	5.52±1.19	2-8
Test Used		F=0.76 P=0.468		F=0.85 P=0.427	
Duration of work per day					
1-5	12	1.42±0.79	0-2	4.92±1.44	2-6
6-8	100	2.17±1.56	0-7	5.47±0.99	3-8
More than 8years	91	2.37±1.52	0-6	5.81±1.15	4-8
Test Used		F=2.23 P=0.111		F=4.76 P=0.010*	
System work					
Morning	90	2.21±1.75	0-7	5.64±1.24	2-8
After noon	40	2.02±1.06	0-4	5.4±0.59	4-6
Night	5	2±0	2-2	5±0	5-5
By change	68	2.36±1.46	0-6	5.68±1.2	4-7
Test Used		F=0.45 P=0.716		F=1.06 P=0.366	

Independent T-test quantitative data between the two groups

-One-way Anova test quantitative data between the Three groups or more

*Significant level at P value < 0.05, **Significant level at P value < 0.05

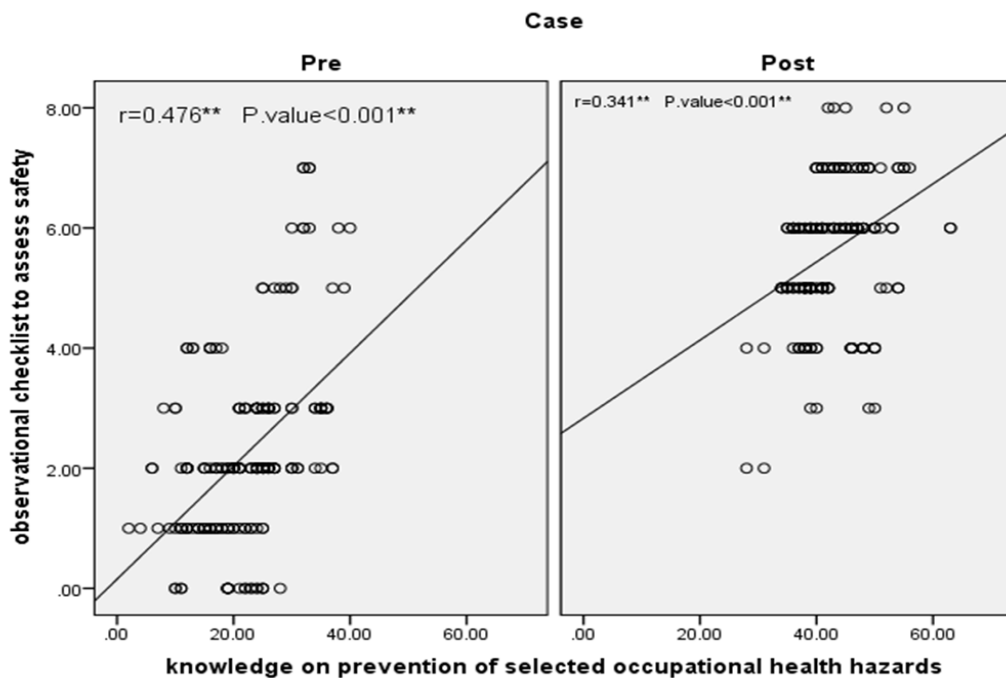


Figure (2): Correlation Co-efficient between knowledge level on prevention of occupational health hazards and practice of street cleaners pre and post program.

Discussion

Due to their working conditions, street cleaners are exposed to a variety of health risks that might induce serious morbidities. They are prone to a variety of occupational hazards because they are frequently exposed to dust, biodegradable waste, bioaerosols, volatile organic compounds, and mechanical stress (Adekiya et al., 2022 and Habybabady et al., 2018)

This study was carried out in order to evaluate the effect of Preventive health program regarding knowledge and practice of street cleaners about occupational health hazards at Sohag city

Concerning Street Cleaners current suffering health problems during working. It revealed that more than three quarter of street cleaners were suffered from health problems during working as more than quarter of them had respiratory diseases and less quarter of them had musculoskeletal diseases. Street cleaners may work for a certain period of time lifting, pulling, pushing, or carrying loads, and walking for extended periods of time, which cause developing occupational musculoskeletal diseases. These

findings may be attributed to the nature of their work, as they are constantly exposed to a variety of inhalable agents such as dust, toxins, and traffic emissions, making them susceptible to developing occupational respiratory diseases.

This finding supported by (Marahatta et al,2017) who conducted study about the municipal solid waste handlers' knowledge of occupational health hazards and safety practice in the context of Nepal, which reported that 63.7% of respondents said they had occupational health issues.

This study agree with (Henok and Mesafint ,2020)who conducted study about Occupational Health Conditions and Associated Factors Among Municipal Solid Waste Collectors in Addis Ababa, Ethiopia revealed that the majority of survey participants experienced various health symptoms, with musculoskeletal symptoms accounting for 21.8% of the total.

This result was also confirmed by (Abd El-Wahab et al.,2014,)who conducted the study about Adverse health problems among municipality workers in Alexandria who mentioned a higher prevalence rate of

respiratory complaints, particularly cough, by 29.1% (dry or productive).

These findings conflict with (**Ravindra et al., 2016**) who conducted study in the Occupational exposure to the municipal solid waste workers in Chandigarh who reported that the majority of the participant suffering from musculoskeletal disorders and respiratory problems due to difference in sample size and environmental exposed and duration of work per day.

Regarding exposed to injuries, The majority of street cleaners were exposed to injuries during working as less than two third of them had laceration . More than half of street cleaners were exposed to injuries during working due to Broken bottles. This could be as a result of the fact that street cleaners were observed working without any personal protective equipment, putting them at a high risk of injury. They may have driven their spades into garbage piles with their feet and occasionally wiped waste with their hands or feet.

These finding supported by(**Johnson and John,2020**) who conducted study about Workplace risks and health issues among street sweepers in Uyo, Nigeria, who reported that the majority of the study sample had exposure to cut by broken bottles.

This result is consistent with a study by (**Pradeep and Dhananjay, 2016**) that looked at occupational morbidity among Municipal Solid Waste loaders in Mumbai and found that the great majority of workers experienced occupational injuries. This can be ascribed to the un favorable working conditions, such as noise, crowding, darkness, and slick floors.

This result is confirmed by (**Tefera and Negussie ,2015**) who conducted study about Micro and small firms in solid waste management: Experience of chosen cities and towns in Ethiopia, which found that 95% of workers in the sector were exposed to injuries.

The current study findings were in disagreement with study by (**Daniel et al., 2014**) who conducted the study about Assessment of occupational injuries among Addis Ababa city municipal solid waste collectors: a cross-sectional study who reported

that more than two fifth of the workers exposure to injury during works.

The current study revealed that the street cleaners' knowledge about hazards at work and how to prevent them had considerably elevated from the pre-program to the post program with a p-value = ($<0.001^{**}$).These findings might be referred to the occupational health programs they were never exposed to before, as evidenced in this study, with no worker training before the current program. Also, the program provided knowledge that touched their personal safety, which was very interesting to them.

This finding supported with (**Awad et al,2023**) who conducted the study about A waste collection worker occupational health program in Suez Governorate who revealed that a statistically significant difference in all knowledge areas, including first aid, occupational health and safety measures, categories of workplace risks, and preventive actions against such hazards, comparing pre- and post-program implementation.

These finding supported by (**Kumar et al., 2016**) who conducted the study about Impact of waste management training intervention on knowledge, attitude, and practices of teaching hospital workers in Pakistan. They discovered that the mean knowledge scores varied statistically significantly 18 months after the intervention because the baseline and intervention groups had statistically significantly better knowledge at p-value = (<0.001).

These finding agree with (**Abouzeid et al.,2022**) who conducted study about the effect of an Educational Program on Utilization of Personal Protective Equipment among Municipal Waste Workers at Mania City, Egypt who reported that Before and after the educational intervention, there were highly statistically significant differences in the workers' overall knowledge scores about occupational injuries and Personal Protective Equipment,. It could be linked to the educational intervention's successful transformation of workers' attitudes and behaviors about the use of personal protective equipment at work.

These findings are supported by (**Rungsoongnoen, et al., 2019**) study, "Effects of Perceived Self-Efficacy Program on Personal Protective Equipment Use Among Street Sweepers in Mueang Sisaket District," which found that the experimental group's knowledge of occupational threats and Personal Protective Equipment and their wearing behavior improved after intervention, with statistically significant improvements.

The current study showed that the majority of the street cleaners were poor knowledge in pre-test which developed in post to the majority of them were fair knowledge. There is a very statistically significant difference between the pretest and posttest, and the preventive program's implement help the street cleaners' practices improved.

These results could be attributed to the fact that street cleaners lack knowledge because less than half of them worked more than eight hours per day, and nearly half worked between six and eight hours. Additionally, more than a third of the study sample could not read or write, most of them lived in rural areas, none had previously taken an occupational safety course, and the local council in Sohag was not interested in offering occupational safety courses to street cleaners. It was concluded that the educational program had a beneficial effect because their knowledge had increased by the time of the posttest.

These finding supported by (**Ranjani , 2012**) who conducted study about A Quasi experimental study to evaluate the effectiveness of planned teaching program on knowledge and attitude of sanitary workers regarding prevention of occupational health hazards in selected areas at Madurai who reported that majority of sanitary workers had inadequate knowledge on prevention of occupational health hazards in the pre test while improved to less than three quarters adequate there is a statistically significant difference between the pre test and post test knowledge level of the sanitary workers.

The current results are similar with a study conducted by (**Mohammed et al. in 2022**) regarding workers' health awareness of workplace risks, which showed that most

workers had a low level of general understanding about occupational dangers.

This finding contrasted with (**Amabya, 2016**) who examined occupational risk and hazard exposure, knowledge of occupational health, safety practices, and safety at work measures among Ethiopian workers and discovered that most employees had poor levels of knowledge about occupational hazards at work. This might be brought on by a decrease in training opportunities at the current workplace.

The current study illustrated that the majority of the street cleaners were poor practice in pre-test which developed in post test to more than two third and more than quarter of them had fair and good practice respectively. There is a very statistically significant difference between pretest and posttest, and the teaching program's implement improved the street cleaners' practices.

Theses finding supported by (**Awad et al., 2023**) who conducted study about An occupational health program for waste collection workers in Suez Governorate who revealed that total garbage collection worker practices were unsafe before and improved after the program with statistically significant variations in all safety practices implemented before and after the program.

As stated by (**Rajapaksha et al.,2017**) in their study Effectiveness of Health and Safety Training for Municipal Waste Collectors: A Case Study from Galle, Sri Lanka, "The interventions made by conducting the training program described in this study had effectively created a significant improvement in knowledge, attitude, and practices of the respondents ($p < 0.05$)," the interventions were carried out by conducting the training program.

These results agree with (**Kumar et al., 2016**) who reported that a statistically significant improvement in the practices of waste collection workers after an occupational health program ($p < 0.05$). Workers in the health care and sanitation sectors performed statistically considerably better in the intervention group ($p < 0.001$).

Regarding their relationship between street cleaners regarding to their score of knowledge

and demographic characteristics. there is a statistically significant difference between total knowledge levels and Years of experience in the pretest **P=(0.003)** and between total knowledge levels and Age, residence, education level, marital status, duration of work per day, and system work in the pre and post test **P=(0.000, 0.000, 0.000, 0.001, 0.000,0.000, 0.001, 0.001,0.000, 0.000,0.019, and 0.016)** respectively.

These finding supported by (**Abouzeid et al., 2022**) who reported that In both the pretest and posttest, with P-values (0.001, 0.001, 0.001, and 0.001) respectively, there was a highly statistically significant correlation between workers' overall knowledge of personal protective equipment and their demographic information regarding their age, residence, education, job, work experience, and work status.

These results are in line with those of (**Laor et al., 2018**) who studied the knowledge, attitudes, and practices of highland residents in Northern Thailand regarding municipal solid waste management. They found that age and educational level were statistically significant predictors of knowledge, attitudes, and practices regarding medical solid waste management.

These finding supported by (**Zaky et al., 2018**) who stated that The relationship between total score knowledge among studied workers and their socio demographic variables revealed a statistically significant difference between workers' knowledge and their age, degree of education, job, and years of experience at P-value. (0.008, 0.000, 0.008 and 0.021)respectively.

This finding contrasts with the findings of (**Asgedom et al., 2019**)who conducted the study about Knowledge, attitude and practice related to chemical hazards and personal protective equipment among particleboard workers in Ethiopia who discovered no correlation between knowledge score, years of experience, and workers' age.

Regarding their relationship between street cleaners regarding to their score of practice and demographic characteristics. the difference between the total practice level and educational level between the pretest and posttest is statistically significant **P=(0.000)**. a statistically significant difference was found between total

practice level and residency in the pretest (**P=0.017**), and between total practice level and age, marital status, and daily job hours in the post test (**P=0.004, 0.002 and 0.010**) respectively. According to the researchers, this association could be explained by older workers' increased awareness of personal protection equipment and their dread of catching infections.

Because workers in urban areas are more likely to bring personal protective equipment to work than those in rural areas, workers' residence in both urban and rural areas can have an impact on the use of personal protection equipment.

The workers' degree of education made them more open to learning more about the use of personal protective equipment. In addition, street sweepers are more likely to meet with local municipal authorities since they are concerned about being fined or losing out on discounts if they do not wear personal protective equipment.

These finding supported by (**Abouzeid et al., 2022**) who reported that in both the pretest and posttest, where P-values were 0.001, 0.001, 0.001, 0.001, 0.001, 0.001, and 0.001, respectively, there was a highly statistically significant relationship between the workers' practice level and their demographic data related to their age, residence, education, job, and work experience.

This results was confirmed by (**Byonanebye et al., 2022**)who conducted the study about the occupational Injuries and use of Personal Protective Equipment among Casual Municipal Solid Waste Workers in the Informal Sector in Kampala who demonstrated that older age and past experience using personal protective equipment were associated with increased likelihood of using personal protective equipment.

Also, it was consistent with findings of (**Panthi et al., 2019**) who conducted study about the association of knowledge on waste handling and use of personal protective equipment among waste handlers who revealed that education was found statistically significant related to the use of personal protective equipment.

It was also comparable to a study by (**Diwe et al., 2016**) who investigated occupational risks, safety, and hygienic practices among timber workers in a South Eastern State of Nigeria. They found that age, sex, and recipient of pre-

employment were statistically significant with the use and awareness of personal protective equipment.

This finding disagree with the findings of (Zaky et al., 2018) who reported no correlation between performance score, age, education, marital status and job.

There is a very positive association between the street cleaners' overall knowledge and practice scores regarding prevention of occupational hazards in pre-test and post-test $r = (0.476 \& 0.341)$ $p = (0.000 \& 0.000)$ respectively

Theses finding supported by (Awad et al., 2023) who showed that the good knowledge score and safe practices that have been adopted since the occupational health program's introduction are statistically linked. This outcome could be explained by the fact that safe practices were improved as garbage collection workers' knowledge increased.

Also supported by (Abouzeid et al., 2022) who showed that in the pretest, there was a positive correlation between workers' knowledge and practices ($r=0.752$), with highly statistically significant differences ($p=0.001$) between the groups.

These results confirmed with (Khan et al., 2019) who conducted the study about a mini review of healthcare waste management in Asian poor nations who stated that a statistically significant relationship between Waste Collection Workers' knowledge and practice that determined that solid waste collection training or health education program should be provided to all WCWs from the start of their work.

Conclusion:

According to the results and research hypothesis, this study concluded that, there was a statistically significant improvement in the level of knowledge pre and post program implementation, also statistically significant improvement in the level of practice.

Recommendations:

1- Periodic health prevention program should be performed to update the workers' awareness of health hazard prevention

2-Regular periodic medical examination for all street cleaners are important for the early identification of any health issues and the provision of appropriate management.

3- All street cleaning workers should have access to personal protection equipment..

4- More research should be done on occupational health program for street cleaners.

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