



OCCUPATIONAL HEALTH HAZARDS AMONG WORKERS IN WARWARA BRICK FACTORY

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ABSTRACT

Background: Brick manufacturing industry is an old and important industry in Egypt, workers with low knowledge may expose to many types of hazards which may affect their health and safety. **Aim:** the study aimed to assess occupational health hazards among workers in warwara brick factory. **Design:** descriptive study design was used in this study. **Setting:** Study was conducted in warwara brick factory at Benha city, Qualiubiya governorate. **Sample:** A convenient sample consisted of 100 worker was recruited. **tools:** Two tools were used for data collection, **I:** consists of two parts; part1, Observational checklist to assess practice of worker's toward safety measures and part2, observational checklist of OHSAS **II:** Interview questionnaire consists of three parts designed to assess socio- demographic characteristics, presence of chronic diseases, worker's knowledge about types of occupational hazards, first aid and how to protect themselves. **Results:** the current study shows that two thirds of workers complain of moist cough, about half complain of inflammation of eyes, most of them complain of pain in the shoulders, 70% of the workers had unsatisfactory knowledge about physical hazards, 40% of them had satisfactory knowledge about chemical hazards, three quarters of sufficient light and enough personal protective equipments not present in the factory and there was highly significant positive correlation between total practice scores regarding occupational health hazards and their total knowledge scores. **Conclusion:** more than one third of workers had satisfactory knowledge about methods of preventions about occupational hazards and first aids, there was highly significant positive correction between total practices scores among workers regarding first aid and their total knowledge. **Recommendation:** improve quality of life of workers by encourage social activities.

Key words: Occupational hazards, Brick factory workers, Safety measures

I -INTRODUCTION

Occupational hazard is defined as the “potential risk to the health of a person emerging from an unhealthy environment” which is a significant public health issue. It can also be referred to as any activity, materials, processes or situation that is likely to cause an accident or disease at the work place. Although improvement in occupational health have been seen in many developed countries, however, the protection of workers from work-related disorders is not a priority in many developing countries, partly because several other health issues have competed with occupational health. This situation has existed for long owing to various socio-economic, cultural and political challenges which often make occupational health not prioritized, this has made occupational health and safety which is a fundamental right in maintaining workers’ wellbeing to remain neglected in developing countries [1].

Workers spend about one third of their lifetime at workplace. Workers expect safe working environment as their fundamental human right. Workers all over the world, face dual occupational hazards, This is resulting into injuries, accidents, illnesses, disabilities and death. Occupational health issues affect individuals families and communities, as well as the citizens of the world, hence the need for occupational health [2].

Occupational health and safety (OHS), is a multidisciplinary concept that concentrates on the promotion of safety, health, and welfare of people engaged in work or employment, occupational injury, illness and workplace facilities are important public health concerns [3].

The International Labor Organization (ILO) estimates that more than 2.3 million deaths per year occur as a result of occupational accidents or work-related diseases. About 317 million accidents occur on the job annually and 160 million were inflicted by occupational diseases annually. an economic cost is 1.8% and 6% of Gross Domestic Product (GDP) in country estimates, being average 4% [4].

Brick manufacturing industry is an old and important industry in Egypt. It involves three main steps: clay shaping with water (molding), drying with solar energy and

firing with fuel (baking), four main activities take place in the brick factory. These are: preparing mud and laying brick, carrying raw bricks to kiln, working inside the chimney and carrying out cooked brick. Work inside the chimney [5].

Major hazards posed to brick kiln workers are chemical, physical, biological, psychosocial and ergonomic. Chemical hazards include exposure to brick dust, silica, carbon monoxide (CO), sulfur dioxide (SO₂), fluoride compounds and nitrogen oxides (NOX). The workers are also exposed to burnt mud dust mixed with coal and cooked brick. Physical hazards include heat stress and excessive exposure to noise while working in the furnace. Biological hazards are contact with soil, insects and animals. Lifting heavy weights, improper posture and repetitive movements are ergonomic hazards that can lead to chronic musculoskeletal problems. Psychosocial hazards are high levels of stress, low self-esteem and abuse at work [6].

Occupational health nurses (OHNs) is the specialty practice that provides, delivers of health safety programs and services to workers in brick factory. The practice focuses on promotion and restoration of health, prevention of illness and injury, and protection from work-related and environmental hazards in brick factory [7].

OHNs perceive and recognize dangers; screen, assess, and investigate these risks by leading examination on the impacts of brick industrial facility exposures; assemble and use wellbeing and peril information to choose and execute preventive and control measures as a constant procedure. Models incorporate an investigation of the impacts of harmful synthetic introduction, improvement of plans to forestall business related mishaps, and an examination of gatherings, not only people, to recognize designs, patterns, changes, and shared characteristics as in pandemic circumstances [8].

1.1 Significance of the study

The international labour organization (ILO) estimates that some 2.3 million women and men around the world succumb to work-related accidents or diseases every year; this corresponds to over 6000 deaths every single day. Worldwide, there are around 340 million occupational accidents and 160 million victims of work-related illnesses annually [9].

In brick kiln industry the exposure to carbon monoxide and silica dust is the most common occupational hazard to the workers in these industries, A high level of morbidity in the form of headache, body ache, problems with vision, cough and breathlessness were observed in both industries. It is strongly recommended to take pollution control measures [10].

Relayed that high counts of COPD hospitalizations and other respiratory symptoms among brick workers have been reported: 22.4% of workers experience a chronic cough; 21.2% have chronic phlegm; 13.8% have experienced attacks of shortness of breath with wheezing; 17.1% have chronic bronchitis; 8.2% have physician-diagnosed asthma; and among non-smokers, 8.9% have chronic bronchitis. The study also found that workers in the baking sections of brick production were also at higher risk for developing asthma and bronchitis than workers in other areas of brick production. These findings can be expected in the population of brick workers [11].

1.2 Aim of study:

This study was carried out to assess the Occupational health hazards among workers in Warwara brick factory at Warwara village, Banha city, Qaliubiya governorate, through:

- 1- Assess knowledge and practice of the workers regarding occupational health hazards.
- 2- Assessing occupational health and safety measure in the work place.
- 3- Measuring the extent the occupational health and safety assessment series (OHSAS, 2008) have application in the field of work.

1.3 Research questions:

- 1-What are the occupational health hazards affecting worker's health in Warwara brick factory?
- 2-What are the worker's knowledge and practice about the occupational health hazards?

3-What are the occupational health and safety measure in the work place? 4-Is there a relationship between workers' knowledge and practice regarding occupational health hazard in brick factory?

II- Subjects and methods

2.1 study design:

A descriptive research design was used in this study.

2.2 Study Setting:

The study has been carried out in Warwra brick factory. This factory was established at Warwara village, Banha city, Qaliubiya Governorate.

2.3 subjects:

The convenient sample consisted of 100 workers. The total number of factory brick workers were 100 in years 2018 and all workers were included in the study .The factory consists of 6 sections they are: Impaste of clay and it contains 15 workers, Clay shaping and it contains 15 workers, Drying of molding and it contains 20 workers, Carrying mold to kiln and it contains 20 workers, Burning bricks and it contains 5 workers and Transporting bricks from fire to vehicles and it contains 25 workers.

2.4 Tools of data collection:

Two tools were used for data collection.

Tool I: A structured interviewing questionnaire was designed and utilized by the investigator to collect the necessary data. It is divided to four parts and entailed the following items:

- **Part I:** includes questions related to demographic characteristics of the workers such as age, level of education, years of experience, family member, marital status, and monthly income, number of rooms, work shifts, training program and types of training program (**covered questions from 1 to10**).
- **part II:** includes questions related to presence of past and present history such as suffering from chronic diseases, types of chronic diseases, smoking, types of

smoking, number of cigarettes smoking daily, number of shisha every day, smoking during the work, effect of smoking on health. **(Covered questions from 11 to 17).**

- **Part III:** include questions related to occupational health hazards affecting worker' health such as (respiratory problems, digestive problems, eye problem, ear problem, skin problem and neurology problems)**(covered questions from 18 to 24).**

Part IV: include questions related to workers knowledge about types of occupational hazards in the work place such as (physical, mechanical , chemical hazard and psychological hazard).**(covered questions number 25) .**

-workers knowledge regarding methods of prevention of occupational hazards such as secure the work environment. Good ventilation in the work place and wearing personal protective equipments.**(covered questions number 26).**

-workers knowledge about first aid in the workplace such as how dealing with fractures, wounds, burns, shock, eye injuries, difficulty in breathing, place of treatment. **(covered questions from 27 to 33)**

-workers source of information about occupational hazards such as years of experience television and radio, magazines and newspapers. **(covered question number 34)**

Scoring system:

For knowledge was presented as correct or incorrect answer , (one) score was given for each correct answer and (zero) score was given to incorrect answer, The total knowledge is scored as the following satisfactory knowledge when total score equal $\geq 50\%$ and unsatisfactory if below $< 50\%$

Tool II: Observational checklist

To assess worker practice contain 2 parts.

Part I : Observational checklist of OHSAS (2008) application:

(Environmental Health and Safety Management System, (EH & S) 2008). Checklist observation sheet was modified to evaluate the extent of OHSAS application in the field work. This part is composed of 26 closed-ended questions which cover the ventilation, lighting, enough space between machines, fire

extinguisher, ambulance car, medical clinic inside facility, periodic medical examination, pre-employment examination, presence PPE, enough PPE, training on use of PPE, Periodic checking of PPE, punishments for those not using PPE, leisure time journeys or activates, periodic workers training on occupational safety, emergency plan in cases of emergency, application of emergency plan on real ground, explanation of change of policy to workers, presence of specific employees to identify occupational risks, procedures factory follow after recognition of danger, the workers know these procedures, presence of internal auditors to check safety, role of internal auditors is played, part time during working day, presence of medical records for each worker, computerized of medical records.

Part II: Observational checklist to assess workers practice regarding to using personal protective equipment devices such as (overall uniform, head cover, eye goggles, gloves, protective apron, safety boots and respiratory mask)

Scoring system:

The practice was presented as done practice scored take (one) and not available scored (zero). The practice were considered used , if the percentage score was > 50% or above ; while it was considered not used , if percentage score was less than <50% .

2.5 Validity:

Tools were submitted to a panel of five reviewers and experts of community health nursing from Helwan University and fayoum university; they examined and reviewed the tools for the face and content coverage, clarity, length, and formatting of tools, redesigning and modifications was done according to panel recommendations.

2.6 Reliability:

Reliability test for questionnaire items were done by Cronbach's alpha which was 0.804 for workers knowledge about types of occupational hazards and .0601 regarding workers practice regarding personal protective equipment.

2.7 Ethical considerations:

An official permission to conduct the proposed study will be obtained from the Scientific Research Ethics Committee. Participation in the study is voluntary and subjects will be given complete full information about the study and their role before signing the informed consent. The ethical considerations will include explaining the purpose and nature of the study, stating the possibility to withdraw at any time, confidentiality of the information where it will not be accessed by any other party without taking permission of the participants. Ethics, values, culture and beliefs will be respected.

II- Operational item:

The operational item includes preparatory phase, pilot study and field work.

The preparatory phase:

A review of past and current literature and theoretical knowledge of various aspects of the study using books, articles, internet periodicals and magazines helpful in designing and processing of data collection was used.

2.8 Pilot study:

The pilot study was conducted on 10% from the sample

(10) Workers, workers were chosen randomly to determine its clarity applicability and feasibility, each worker was included in the pilot study already included in the main study sample. Pilot study was aimed to estimate the time needed for completing the study tools, after pilot study was done, data were analyzed and tools modified, redesigned, reviewed by the supervisors, and the final design was developed.

2.9 Field work:

The collection of data was taken 3 months started from the middle of February until the middle of May 2019, the investigator visit the factory, two days weekly in two periods of time from 9:00 am to 12:00 pm and from 1:00 pm to 3:00 pm. The investigator first explain and clarify the aim of the study to the factory manager, then for the workers, gain their support and to be aware of the study's importance, the investigator distribute the questionnaire sheets for each workers and asked them to answer individually to all questions. For the observational checklist the

investigator assesses the factory and its environment during worker's job and assess the workers' practices regarding use of personal protective equipments (PPE)

III- Administrative Item:

Approval to carry out this study will be obtained from the dean of the faculty of nursing and directors of warwara brick factory, this letter included a permission to collect the necessary data and explain the purpose and nature of the study.

IV-Statistical Item:

Upon completion of data collection, data will be computed and analyzed using Statistical Package for the Social Science (SPSS), version 24 for analysis. The P value will be set at 0.05. Descriptive statistics tests as numbers, percentage, mean \pm standard deviation (\pm SD), will be used to describe the results. Appropriate inferential statistics such as "F" test or "t" test will be used as well.

III- RESULTS

Table (1): show demographic characteristics of the study sample, 50.0% of studied workers their aged ranged from 20 < 30 years with the mean age was **28.40 \pm 8.03**. regarding level of education 42.0% were secondary education, 23.0% of them the years of experience were 1<5 years, 80.0% of them working in morning shifts, 71.0% of them were married, 70.0% the family members were 3<6, and 55.0% of them lives in two rooms. also, 78.0% studied workers their monthly income not enough, 20% of them taken training program and 10% of these program was about prevent of dangers.

Table (2): illustrate that the occupational health hazard affecting the workers, regarding respiratory problems, 60% of workers complain moist cough, 42.0% of them complain bronchitis, regarding digestive problems, 40.0% of them complain anorexia, 44.0% of them complain constipation, 62.0% complain colon disorders, regarding eye problems , 53.0% of workers complain inflammation of the eye .regarding ears problems , 34.0% of workers complain pain in the ears. Regarding

skin problems, 58.0% of them complain inflammation of the skin . and regarding the neurology problems , 80.0% of them complain pain in the shoulders.

90% had incorrect knowledge regarding electricity . Regarding mechanical hazards 17.0% of workers had correct knowledge sudden movement and 20% had incorrect knowledge regarding carrying heavy objects. regarding chemical hazards 20.0% had correct knowledge regarding chemical materials and 20.0% of workers had incorrect knowledge regarding dust inhalation , regarding psychological risks 92% of workers had correct knowledge regarding long period of work and 67% of workers had incorrect knowledge regarding lack of cooperation.

Figure (1) : show that 70.0% of workers unsatisfactory knowledge regarding physical hazards , 75.0% of workers unsatisfactory knowledge regarding mechanical hazards , 60.0% of workers unsatisfactory knowledge regarding chemical hazards and 45.0% of the satisfactory knowledge regarding psychological hazards .

Table (4) show that , regarding observation checklist for application of environmental health and safety management system ,100.0% of them not available of work place Ambulance car, medical clinic inside facility , periodic medical examination, pre employment examination, training on use of PPE, periodic checking of PPE , punishments for those not using PPE, leisure time journeys or activates, emergency plan in cases of emergency, application of emergency plan on real ground , explanation of change of policy to workers, presence of internal auditors to check safety, role of internal auditors is played , presence of medical records for each worker and computerized of medical records.

Table (5) shows that, there was highly significant positive correlation between total practice scores regarding occupational health hazards and their total knowledge scores.

Table (1): Percentage Distribution of Studied Workers
According to Their Demographic Characteristics (n=100).

Item	No	%
Age/year		
15<20	15	15.0
20<30	50	50.0
30<40	15	15.0
≥40	20	20.0
Mean ± SD = 28.40±8.03		
Not read and write	13	13.0
Read and write	22	22.0
Basic education	24	24.00
Secondary education	36	36.0
University education or more	5	5.0
Years of experience		
1 <5 years	23	23.0
5 <10 years	26	26.0
10<15 years	32	32.0
≥15 years	19	19.0
Family member		
1<3	20	20.0
3<6	70	70.0
≥6	10	10.0
Marital status		
Signal	21	21.0
Married	71	71.0
Divorced	5	5.0

Widowed	3	3.0
Monthly income		
Enough	22	22.0
Not enough	78	78.0
Enough and saved	0	0.0
Number of room		
Two	55	55.0
Three	41	41.0
More than three	4	4.0
Work Shifts		
Morning	80	80.0
Night	10	10.0
Reciprocally	10	10.0
Training program		
Yes	20	20.0
No	80	80.0
Types of training program: n= 20		
Prevent of dangers	10	10.0
prevent to accident and	0	0.0
First aid	0	0.0
Personal needs in work place	0	0.0
Personal protective	10	10.0

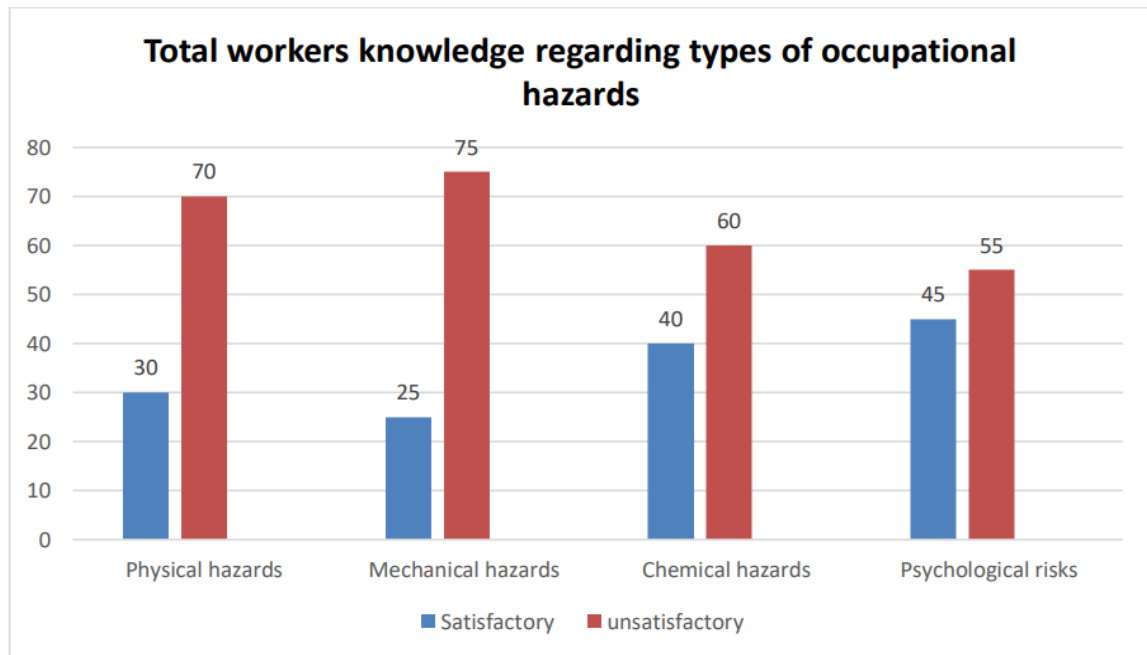


Figure (1): Total workers knowledge regarding types of occupational hazards

Table (2): Frequency Distribution According to Occupational Health Hazard Affecting Workers Health (n=100)

Items	No.	%
Respiratory problems		
Irritation of the membranes of the mouth	40	40.0
Dry cough	55	55.0
Moist Cough	60	60.0
breathing difficulties	10	10.0
Bronchitis	42	42.0
Digestive problems		
Acidity in stomach	20	22.0
Anorexia	40	40.0
Epigastric pain	53	53.0
Colon disorders	62	62.0
Constipation	44	44.0
Diarrhea	20	20.0
Eye problems		
Inflammation of the eye	53	53.0
Heavy tears	44	44.0
Sudden eye pain	50	50.0
Double vision	47	47.0
Ears problems		
Irritation and need for itching	20	20.0
Pain in the ears	34	34.0
Weakness or loss of hearing	10	10.0
Skin problems		
Dry skin	60	60.0
Burning in the skin	20	20.0

Inflammation of the skin	58	58.0
Neurology problems		
Difficulty in feeling heat	8	8.0
Difficulty distinguishing between odors	12	12.0
Difficult to taste	10	10.0
Muscle strain	50	50.0
The presence of pain in the body	60	60.0
The presence of pain in the neck	76	76.0
The presence of pain in the shoulder	80	80.0

Table (3): Workers Knowledge Regarding to Types of Occupational Hazards in the Work place (n=100)

Workers knowledge	Correct		Incorrect	
	No.	%	No.	%
Physical hazards				
Noise	80	80.0	20	20.0
Electricity	10	10.0	90	90.0
Extreme heat	63	63.0	37	37.0
Vibration	35	35.0	65	65.0
Humidity	81	81.0	19	19.0
Mechanical hazard				
Carrying Heavy objects	80	80.0	20	20.0
Standing for long periods	88	88.0	12	12.0
Bending for long period	62	62.0	38	38.0
Sitting for long period	12	12.0	88	88.0
Falling and sliding	65	65.0	35	35.0
Sudden movement	17	17.0	83	83.0
Chemical hazards				
Dust inhalation	80	80.0	20	20.0
Chemical materials such as carbon monoxide and	20	20.0	80	80.0

Psychological Hazards				
Verbal abuse	48	48.0	52	52.0
Long period of work	92	92.0	8	8.0
Lack of cooperation	33	33.0	67	67.0
Lack of appreciation from supervisors	46	46.0	54	54.0
Lack of job satisfaction	89	89.0	11	11.0

***Total items are not exclusive**

Galley Proof

Table (4): Observational Checklist of OHSAS (occupational health and safety assessment series)

Item	present		Not Present	
	NO	%	NO	%
Good ventilation	60	60.0	40	40.0
Sufficient light	30	30.0	70	70.0
Enough space between machines	20	20.0	80	80.0
Fire extinguisher	20	20.0	80	80.0
Ambulance car	0	0.0	100	100.0
Medical clinic inside facility	0	0.0	100	100.0
Periodic medical examination	0	0.0	100	100.0
Pre employment examination	0	0.0	100	100.0
Presence PPE	20	20.0	80	80.0
Enough PPE	30	30.0	70	70.0
Training on use of PPE	0	0.0	100	100.0
Periodic checking of PPE	0	0.0	100	100.0
Punishments for those not using PPE	0	0.0	100	100.0
Leisure time journeys or activates	0	0.0	100	100.0
Periodic workers training on occupational safety	20	20.0	80	80.0
Emergency plan in cases of emergency	0	0.0	100	100.0
Application of emergency plan on real ground	0	0.0	100	100.0
Explanation of change of policy to workers	0	0.0	100	100.0
Presence of specific employees to identify occupational risks	20	20.0	80	80.0
Procedures factory follow after recognition of danger	20	20.0	80	80.0
The workers know these procedures	20	20.0	80	80.0
Presence of internal auditors to check safety	0	0.0	100	100.0
Role of internal auditors is played	0	0.0	100	100.0
Part time during working day	10	10.0	90	90.0
Presence of medical records for each worker	0	0.0	100	100.0

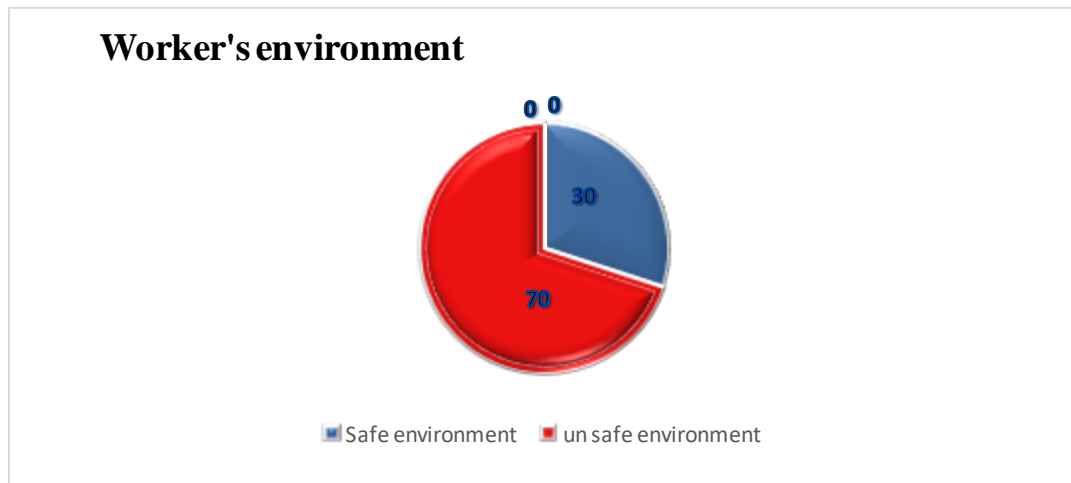


Figure (2): Worker's environment in the brick factory

Table (5): Relation between Workers total Satisfactory Knowledge and Demographic Characteristics (n=100).

Demographic data		Total satisfactory Knowledge			T-test or ANOVA	
		Mean	±	SD	T	P-value
Age	15< 20	12.833	±	4.665	22.761	<0.001*
	20<30	6.077	±	5.491		
	30<40	4.667	±	6.742		
	≥40	7.877	±	7.756		
Educational level	Not read and write	8.823	±	8.579	24.710	<0.001*
	Read and write	1.700	±	2.557		
	Basic education	3.923	±	4.569		
	Secondary education	8.833	±	7.388		
	University education or more	17.308	±	6.562		
Years of experience	1<5	10.834	±	9.667	14.821	<0.001*
	5<10	12.077	±	8.691		
	10 <15	9.677	±	9.755		
	≥15	8.877	±	8.766		
Training program	Yes	9.823	±	8.544	22.761	<0.001*
	No	10.711	±	4.651		
Monthly income	Enough	6.955	±	6.568	1.396	0.250
	Not enough	8.872	±	7.458		

Table (6)Relation between Total Knowledge and Total Practices (n=100)

Item	Total practice scores	
	R	P value
Total Knowledge scores	0.353	0.000**

(*) statistically significant & () high statistically significant $P \leq 0.001$.**

IV- DISCUSSION

The brick industry plays a key role in the Egyptian economy the industry is considered one of the important stages in the brick industry. Throughout the different process, workers can be potentially exposed to various health and safety hazards [12].

Occupational and environmental health nursing are the specialty practice that provides the delivers health and safety programs and services to workers, worker populations and community groups. The practice focuses on promotion and restoration of health, prevention of illness and injury, and protection from work-related and environmental hazards [13].

According to the demographic characteristics of the study, sample indicates that half of workers their age ranged from 20< 30 years. The main age of 28.40±8.03. This finding is consistent with the results of **Shabani et al., (2018)** [14], study conduct in Pakistan , about skin problems among brick industry" and reported that 55% of the workers their age ranged from 20< 40 years.

As regards the workers, levels of education, less than half of the workers had a secondary education from the industrial school, and less than one-quarter of them had read and write. more than two thirds of workers were married. In the same line the study conducted by **Pandey& Vats, (2016)**. [15] a study conduct in chain, about bronchial asthma among brick industry workers." They reported that 88% of the

workers had secondary education and 74% of worker were marriage. Also agreement with that **Baletic, et al., (2018)** ^[16], study conduct in Emirate about chronic laryngitis in the brick industry, they reported that 48% of workers had a secondary education, and 80% of them were married, the investigator point of view , the nature of work in the brick factory accepts workers who have technical secondary education.

Regarding the years of experience of the study sample , more than one fourth of them the years of experience 1<5years , one quarter of workers the years of experience 5< 10 years. This finding agree was in accordance by **Maaten et al. (2017)** ^[17], study conduct in USA about" chronic diseases risk factors that Physical Inactivity in brick industry", found that , 25% of workers the years of experience 1< 5 years . The investigator point of view the nature of work in brick factories is very hard work and this makes workers not continue to work for long periods.

Regarding the training program, more than three quarters not participate in any training program, and one fourth of them giving training program about how to prevent danger and personal protective equipment. This finding disagree with results by **(Shikdar and Sawaqed, 2018)** ^[18], study conduct in Nepal about ergonomics and occupational health and safety in the brick industry" found that, the majority of workers participate the training program about occupational safety, personal occupational equipment and first aid.

Regarding work shifts, more than three quarters of them working the morning shifts. Regarding family members more than two thirds of workers had the family members 3< 6, more than half of them the number of rooms were two rooms and the more than three quarters of them the monthly income not enough . This finding agree was in accordance by **morgan et al., (2016)** ^[19] , study conduct in Bangladesh stated that the 88% of workers in industry working morning shift. and the 80% of the family income not enough Also, This finding disagree with by **Tucker et al., (2018)** ^[20] ,study conduct in Iran about "The Effects of Age and Shift work on Perceived Sleep Problems in brick workers " , reported that more sleep problems than both current shift workers and those who had never worked shifts these sleep problems lead to disturbance in control

and concentration which increase risk factors for occupational injuries and majority of them the monthly income were not enough .

Regarding the occupational health hazards affecting the worker' health regarding respiratory problems, about one tenth of workers complain of breathing difficulties . Less than two-thirds of them complain of moist cough, about two fifth complain of bronchitis and irritation of the membranes of the mouth .This finding agree with by **Awan, (2017)** ^[21]. study conduct in Pakistan about "Occupational health and safety in brick factory ", who found that, 15% of workers complain of breathing difficulties, 64% of workers complain of moist cough , 42% bronchitis and 40% irritation of the membranes of the mouth . For the investigator point of view the workers continuous exposed to dust lead to breathing difficulties cough, bronchitis and irritation of the membranes of the mouth.

Regarding to workers' complain digestive problems, less than half of workers complain anorexia and constipation, and more than half of them complain of colon disorders and epigastric pain. This finding was in accordance by **Brauer et al ., (2016)** ^[22], study conduct in Israel about "consistent risk factor pattern for symptoms related to the sick building syndrome: a prospective population study. International archives of occupational and environmental health", found that ,40% of workers complain anorexia and constipation , and 60% of them complain of colon disorders and epigastric pain .

Regarding the workers' complain eye problems, more than two fifths of workers complain of inflammation of the eye, about half of workers complain sudden eye pain and heavy tears. This finding agrees was in accordance by **Shikdar, (2017)** ^[23]. Study conduct in Sweden about "Ergonomics, and occupational health and safety in the brick industry", found that , 45% of workers complain of inflammation of the eye, 50% of workers complain sudden eye pain and heavy tears. The investigator point of view , all workers are exposed to dust and sunlight long periods of time during the working period lead to inflammation of the eye and complain sudden eye pain and heavy tears.

Regarding the workers' complain ears problems, more one third of workers complain of pain in the ears , and less than one quarters of them complain irritation and need for

itching This finding agree with by **Brauer et al., (2016)** ^[24]. found that , 35% of workers complain of pain in the ears , and 20% of them complain irritation and need for itching.

Regarding the workers' complain skin problems, more than half of studied workers complain from inflammation of the skin, two third complain from dry skin. This finding agrees was in accordance by **Euro stat. (2019)**. ^[25] About "Causes and Circumstances of Accidents at Work in the EU" found that, 60% of workers complain from inflammation of the skin , and 60% of workers complain of dry skin .Also agree with **Akter (2016)**, ^[26] study conduct in Bangladesh reported that workers having years of experience more than 10 years were more exposed to hearing loss, eye problems, high blood pressure, respiratory damage resulting from dust, thermal stress from high temperature and occupational traumatic injuries including amputations, fractures, lacerations, and death.

Regarding the worker's complain neurology problems, most of them complain pain in the shoulders, and three quarters of them complain of pain in the neck, half of them complain from muscle strain. This finding agrees with **Fleming & Lardner, (2018)**. ^[27], study conduct in USA about "Strategies to promote safe behavior as part of a health and safety management system", found that, the 83% of workers complain pain in the shoulders, and 70% of them complain of complain of pain in the neck and 50% of workers complain muscle strain. The investigator point of view, the difficult nature and type of work in the factory for long periods of time leads to pain in the shoulders, pain in the neck, and muscle strain.

Concerning the workers knowledge regarding types of occupational hazards, regarding the worker's complain physical hazards, more than three quarters of workers had correct knowledge about noise and about two thirds of them had correct knowledge regarding extreme heat, humidity. This finding agree with **Harrison & Legendre, (2018)** ^[28] ,study conduct In Saudi Arabia About "Technological innovations, organizational change and workplace accident prevention", found that , 82% of workers

had correct knowledge regarding physical hazards such as noise and 60% of them had correct knowledge regarding extreme heat and humidity.

Regarding their mechanical hazards , the majority of workers had incorrect knowledge regarding sit for long period , sudden movement , about two thirds of them had correct knowledge regarding bending for long. This finding agree with **Kaminski (2016)** ^[29]. study conduct in Japan about " Unintended consequences organizational practices and their impact on workplace the workers" study result showed that the workers had incorrect knowledge about occupational hazards in the workplace due to the factory did not give periodic training to workers about the occupational safety.

Regarding the workers knowledge regarding chemical hazards, about three quarters of workers had satisfactory knowledge regarding dust inhalation. This finding agree with **Lund, & Aarø, (2018)** ^[30]. study conduct in Iraq about " Accident prevention ,Presentation of a model placing emphasis on human, structural and cultural factors. Safety Science", found that, 82 % of workers had correct knowledge regarding chemical role of organizational factors and job characteristics, in Emirates" found that 60% of workers incorrect knowledge regarding chemical hazard.

Regarding to the worker's knowledge regarding psychological hazards, the majority of them had correct knowledge about long period of work and About one tenth of them had incorrect knowledge about lack of job satisfaction. This finding agree with **Henry, (2017)** ^[31]. Study conduct in Zimbabwe about " Ergonomic hazards on brick making industry" , found that 90% of workers had correct knowledge about long period of work and 9% of them had incorrect knowledge about lack of job satisfaction.

Regarding to total workers knowledge regarding types of occupational hazards, more than two thirds of workers unsatisfactory knowledge regard physical and mechanical hazards, and more than half of them unsatisfactory knowledge regarding chemical and psychological hazards. This finding agrees was in accordance by **Ibrahim, et al. (2018)** ^[32]. study conduct in Egypt About " Safety in The Office: Does It Matter to The Staff", found that , 70% of workers unsatisfactory knowledge regarding types of occupational hazards chemical, physical, mechanical and psychological hazards. The investigator

point of view the majority of workers unsatisfactory knowledge about different types of occupational hazard due to not giving any training program and the majority of workers the years of experience $1 \geq 5$ years.

Regarding to observational checklist of (OHSAS) occupational health safety , the present study showed that two thirds of work place were good ventilation , and one fourth of workplace were sufficient enough space between machines , fire extinguisher , presence of PPE and zero percent of workplace as ambulance car, presence of internal auditors to check safety, presence of medical record for each workers, computerized of medical records and periodic medical examination inside the brick factory were not present in the brick factory which may be explained by lack of safe working environment and no application the Occupational Health and Safety Assessment Series (OHSAS). In this respect, **Levy & Wegman, (2018)** ^[33], study conduct in Sweden about "Occupational health: Recognizing and preventing work – related disease and injury", reported that the good lighting enhances the ability of workers to perceive and react to these hazards. As well, **Rosenstock, et al., (2015)** ^[34], study conduct in Emirate about "Text book of clinical occupational & environmental medicine", , mentioned that the poor ventilation is a central component of hazard of work, In the investigator point of view not application of OHSAS policies and rules of the brick factory lead to lack of safe work environment.

In our study, we found that there was a significance relation between workers total knowledge score level and total practice about safety measure. Also contradicted with **Beseler and Stallones (2019)** ^[35] in their research about Safety Knowledge, Safety Behaviors, Depression, and Injuries in Colorado Farm Residents. They found differences in relation between workers total knowledge and safety measures and workers total practice.

V-CONCLUSION

The present study concluded that, regarding to respiratory problems two thirds of workers complain of moist cough, regarding to digestive problems one fourth of them complain of acidity in stomach, regarding to eye problems half of them complain of

sudden eye pain, regarding to ears problems about one tenth of them complain of weakness of hearing, regarding to skin problems two thirds of them complain of dry skin, regarding to neurology problems most of them complain of pain in the shoulders, less than half of them had satisfactory knowledge about chemical and psychological hazards and more than two thirds of them had unsatisfactory knowledge about physical and mechanical hazards, two thirds of good ventilation is present, one fourth of fire extinguisher and presence of PPE are present in the workplace and 100% of ambulance car periodic medical examination not present in the work place, there was highly significant positive correlation between total practice scores among the workers regarding occupational health hazards and their total knowledge scores.

VI-RECOMMENDATION

In the light of the study finding and research question, it is recommended to:

- Orientation program for the new workers should be started before beginning of the work which should focus on the needs and requirement of the job.
- Disseminating health education booklets to increase workers knowledge and practice toward the occupational health and safety which should focus on the most common health problems associated with their work, occupational hazards, first aid in case of emergencies and the safety measures.
- Improve quality of life of workers by encourage social activists
- Regular periodic screening for all workers.
- First aid supplies and the personal protective equipments should be available in the workplace.

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