

Occupational Health Program about Prevention and Control of Health Hazards among Bakery Workers in Assuit City -Egypt

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Abstract: Back ground: The bakery business can be enjoyable and rewarding profession, but the bakery process generates diverse risks on exposed workers. Most of these hazards are preventable. **Aim of the study:** to evaluate impact of occupational health program about prevention and control of health hazards among bakery workers at Assuit city. **Subjects and Methods:** A quiz -experimental research design was utilized in this study. The study was conducted at (5) East and (5) West bakeries at Assuit city **Sample:** The total number of bakeries at Assuit city about 89 bakeries. It included (11%) from total number of bakeries. Systematic random sample was used for selecting the study bakeries. Convenient sample was used for workers. The total number was 87 workers. **Two tools** were used in this study; **the first tool** was a structure interview questionnaire sheet about Socio-demographic characteristics and worker's knowledge about occupational hazards, prevention and control. **The second tool** was observational checklist was used to evaluate safety measures of bakeries workers. **Results:** It was clear that 40.2 % of the studied workers aged < 25 years. Also 98.9% of workers had unsatisfactory knowledge in pre test. It improved in post test. **Conclusion:** The workers had unsatisfactory knowledge and practice in pre test. It improved in post test. **Recommendations:** First aid facilities and personal protective devices should be available in all bakeries.

Key words: Bakery workers, occupational hazards, prevention, and control

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I. Introduction:

Occupational health refers to the identification and control of the risks arising from physical, chemical, and other workplace hazards in order to establish and maintain safe and healthy working environment. Occupational Health is the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations by preventing health hazards, controlling risks and the adaptation of work to people, and people to their jobs. (National Institute of Environmental Health Science, 2015)

Work-related hazard as the risk to the health of a person usually arising out of employment. It is also refers to process or situation that predisposes or causes accidents or disease at work place. Workplace hazards are brought about by unsafe work conditions” and “unsafe work behaviors. However, workplace hazards or injuries are preventable with the use of appropriate occupational safety and health services. (Kalejaiye, 2013)

Injuries were the most common result of workplace hazards. It has been estimated that worldwide there are more than 350,000 workplace fatalities and more than 270 million workplace injuries annually, the most common result of workplace hazards. Approximately 2.9 million nonfatal occupational injuries in the United States. (U.S. Bureau of Labor Statistics, 2015)

The workplace health hazards of bakery workers are chronic obstructive pulmonary diseases like emphysema and bronchial asthma. Injuries from accidents are equally common among bakery workers. These could arise from slips and falls on wet or uneven floor surfaces. Cuts from sharp or moving machinery, falls from heights as well as burns and scalds from hot ingredients. are also frequent causes of accidents. (Fishwick et al, 2011)

protection of workers in their employment from risks resulting from factors adverse to health, adaptation of work to man, and each man to the job. Placing and maintenance of the workers in an occupational environment adapted to his physiological and psychological capabilities. Improvement working conditions; social security. Protection of workers where their employment contract is terminated. (Stell man, 2014)

Occupational health nurses can play a major role in protecting, preventing and improving the health of the working population. They can also make a major contribution to the sustainable development, improved

competitiveness, job security and increased profitability in enterprises and communities by addressing those factors which are related to the health of the working population. (WHO, 2015) and (Salazar, 2016)

Significant of the study:

The heat associated with ovens in a bakery can be a hazard; the excessive heat can affect cardiovascular function for example, causing syncope (fainting) and other consequences. (North Lanarkshire Council, 2014)

Exposures to occupational hazards in bakeries are generally indicating poor safety standards, Careless handling and cause serious injuries and health problems. So workers need to be warned of about safety measure and prevention of health hazards. Studies regarding bakery workers are considered important in order to decrease risk and help to improve health of workers.

Aims of the study

1-Assessing bakery worker's knowledge and practice about occupational hazards , prevention and control of health hazards .

2- Designing , Implementing and Evaluating occupational health program about prevention and control of health hazards among bakery workers.

Research hypothesis:

- Lack of worker's knowledge and practice about occupational hazards, prevention and control of health hazards before the program .
- Improve worker's knowledge and practices toward prevention and control of health hazards after implemented health educational program.

Subjects and methods:

Research design:

A quiz -experimental research design was utilized in this study.

Study Setting:

It was conducted at (5) bakeries in East city and (5) bakeries in West city at Assuit city - Egypt.

Sample and Sampling:

According to the Assuit Directorate of Supply record, The total number of bakeries at Assuit city about (89bakeries). It's divided into East and West . It included (11%) from total number of bakeries. Systematic random sample technique was used for selecting the study bakeries .The first bakery in the study was selected randomly from the record and then every eight one until the end of the sample.

Convenient sample was used (total coverage) for workers in chosen bakeries. Each bakery had average between 7 to 9 workers. All workers were included in this study. The total number was 87 workers.

Study tools:

Two tools were used for data collection to carry out this study:

I- The first tool:

A structured interview sheet was designed by the researchers based on relevant literature. It consists of three parts

Part (1): Socio-demographic characteristics such as (age, marital status, educational level , years of experience, working system, previous workers training as occupational hazards, using safety measures and first aid).

Part (2): Worker's knowledge about definition of occupational health, types of occupational hazards, health problems facing the workers ,prevention and control of occupational hazards.

Part (3): Bakery workers' reporting practice about first aid for emergency situations as burns, excessive heat. (Yossif. and Abd Elaal, 2012) & (Emmanuel and Sussan, 2014)

The adopted scoring system for knowledge and reported practice as follow:

Scoring system designed for the assessment of knowledge and reporting practice, a score of 1 grade was given for each correct answer and a score of zero grade was given for each incorrect answers and don't know. The score of each item summed-up and then converted into a percent score. (Satisfactory knowledge and reporting practice 50% and more, Unsatisfactory knowledge and reporting practice < 50%). (Khalaf, 2015)

II - The second tool was an observational checklist includes:

- Using safety measures for bakeries workers as protective devices as apron, gloves, shoes, ear plugs, hand washing before and after working, and using body mechanics. (Yossif. and Abd Elaal, 2012) & (Emmanuel and Sussan, 2014)

II. Methodology:

I-Administrative phase:

An approval letter was taken from the Dean of the Faculty of Nursing, Assiut University and then from the Deputy Minister of Directorate supply to conduct the study. After full explanation about the aim of the study. The letter included a permission to carry out the study.

II-Pilot Study:

A pilot study was carried out before starting data collection on (10%) workers, were excluded from the total number of study sample. The aim of pilot study was to test the clarity of tools, and to estimate the time required to fill the form. According to the result of the pilot study necessary modification was done.

Validity of study tools:

It was checked and revised by panel of three experts from community health nursing department Faculty of Nursing at Assuit University who reviewed the instrument for clarity, relevance, comprehensiveness, understanding and applicability.

Reliability test:

Reliability was applied by the researchers for testing the internal of the tool, by administration of the same tools to the same subjects. Cronbach's Alpha reliability for knowledge was 0.791 and for practice were 8.43.

III. Data collection Phase:

Ethical Consideration:

The researchers explained the purpose and nature of the study to every study participant. An informed consent to participate in the study was taken orally from every participant and they assured that the information obtained will be confidential and used only for the scientific purposes of the study.

IV. Data collection:

Field of work

Data were collected and educational program started from the first of September 2015 until the end of June 2016 about 10 months consumed. Every bakery was taken 10 days divided to (day for pre test, 8 days for sessions and day for post test). Each bakery considers one group. The researchers couldn't divide the workers to groups to prevent work interruption. Each bakery worker was interviewed individually (pre -test) by introducing self to the workers then explaining the purpose of the study and obtaining his approval to participate in the study with confidentiality. The average time taken to complete each interview ranged from 20- 30 minutes. Each worker attended 16 sessions. The day divided into 2 sessions. The duration of each day was 2 hours for sessions of knowledge and 3 hours for sessions of practice according to the presented time for three days / week.

Statistical Analysis

Data entry and analysis were done using SPSS version 19 (Statistical Package for Social Science). Data were presented as percentage, mean and standard deviation. Chi-square and Fisher Exact tests were used to compare between qualitative variables. Mann-Whitney test was used to compare quantitative variables between two groups and Kruskal Wallis Test for more than two groups in case of non-parametric data. P-value considered statistically significant when $P < 0.05$.

V. Results:

Table (1): Distribution of studied bakeries' workers regarding to their demographic characteristics at Assuit city, 2016. (N=87)

Variables	No.	%
Age: (years)		
< 25	35	40.2
25 - 30	21	24.1
> 30	31	35.7
Mean \pm SD (Range)	29.06 \pm 10.36 (15.0 – 55.0)	
Educational status:		
Illiterate/ read and write	30	34.5
Basic education	13	15.0
Technical secondary	44	50.5
Marital status:		
Single	37	42.5

Married	50	57.5
Working system in the bakery:		
Morning	34	39.1
Night	53	60.9
Years of experience in the bakery:		
< 5 years	40	46.0
5 – 10 years	27	31.0
> 10 years	20	23.0
Mean \pm SD (Range)	7.56 \pm 7.03 (1 year- 30 yrs)	
Attending training courses:		
Yes	21	24.1
No	66	75.9
Subjects:		
Introduction to work and know the risks that can occur	11	52.4
How to deal in a state of emergency for occupational safety	10	47.6

Table (2): Distribution of studied bakeries' workers regarding to their practice of first aid for burn in pre and post-tests at Assuit city, 2016. (N=87)

First aid for burn	Pre				Post				X ²	P-value
	Done		Not done		Done		Not done			
	No.	%	No.	%	No.	%	No.	%		
Prevent the workers from running, lie him on the land, put out the fire	20	23.0	67	77.0	45	51.8	42	48.2	15.35	0.000*
Extinguish clothing fires immediately	10	11.5	77	88.5	18	20.7	69	79.3	2.72	0.099
Move the workers away from the heat source	55	63.2	32	36.8	76	87.4	11	12.6	13.62	0.000*
Immerse the burned area in cold water for about 10-15 minutes	59	67.8	28	32.2	80	92.0	7	8.0	15.77	0.000*
Don't break any blisters and don't put any type of ointment, butter, creams, oils on burned skin	17	19.5	70	80.5	40	46.0	47	54.0	13.80	0.000*
Apply antiseptic solution and sterile dressing	0	0.0	87	100.0	15	17.3	72	82.7	16.42	0.000*

* Means there is statistical significant difference

Table (3): Using safety measures among bakeries' workers in pre and post-tests at Assuit city, 2016. (N=87)

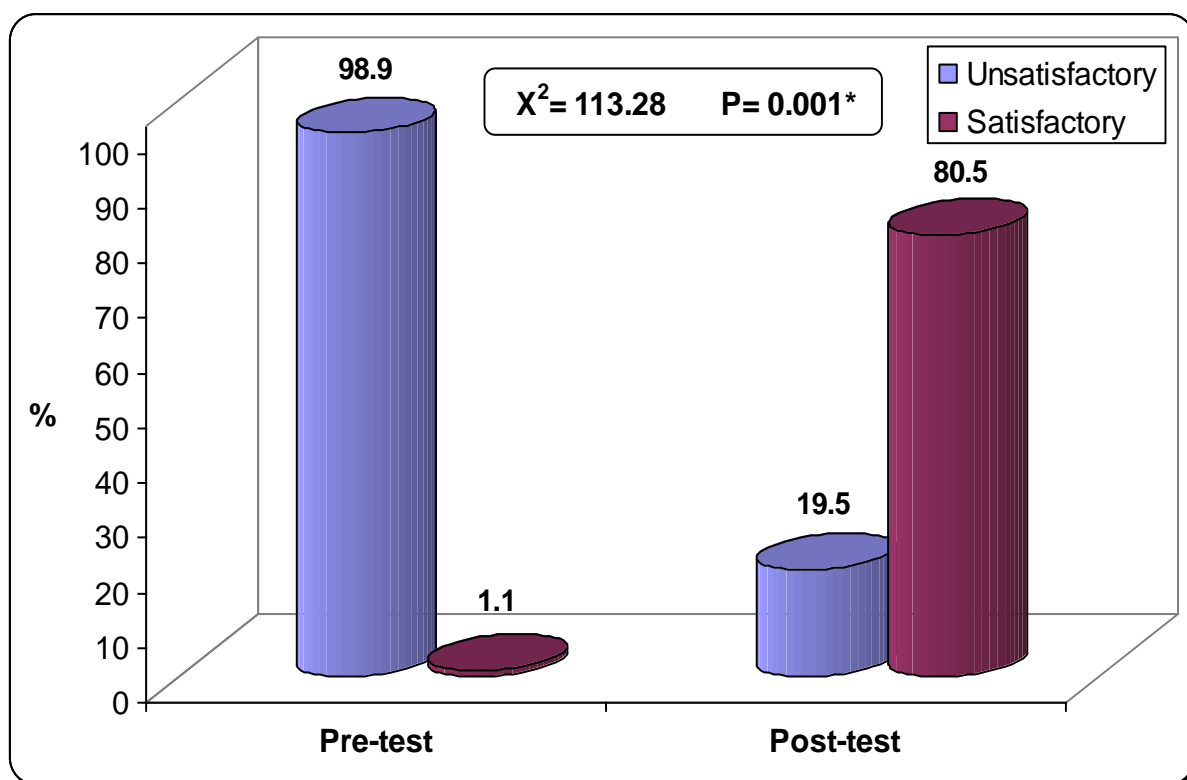
Variables	Pre				Post				X ²	P-value
	Done		Not Done		Done		Not done			
	No.	%	No.	%	No.	%	No.	%		
Personal protective equipment:										
-Apron	0	0.0	87	100.0	0	0.0	87	100.0	--	--
-Gloves	3	3.4	84	96.6	14	16.1	73	83.9	7.89	0.005*
-Shoes/ boots	83	95.4	4	4.6	86	98.9	1	1.1	1.85	0.364
-Facemask	0	0.0	87	100.0	0	0.0	87	100.0	--	--
-Hat	2	2.3	85	97.7	1	1.1	86	98.9	0.339	1.000
-Ear plugs	1	1.1	86	98.9	41	47.1	46	52.9	50.22	0.000*
Personal hygiene:										
-Hand washing before and after beginning work	76	87.4	11	12.6	82	94.3	5	5.7	2.48	0.115
-Cleanliness of face, hair and nails	79	90.8	8	9.2	83	95.4	4	4.6	1.43	0.231
Using handkerchief	19	21.8	68	78.2	41	47.1	46	52.9	12.31	0.000*
Using body mechanics	5	5.7	82	94.3	48	55.2	39	44.8	50.17	0.000*

* Means there is statistical significant difference

Table (4): The relation between the demographic characteristics of the studied bakeries' workers and their knowledge in pre and post-tests at Assuit city, 2016. (N=87)

Variables	Score of knowledge		P-value	Score of knowledge	
	Pre-test			Post-test	
	Mean ± SD			Mean ± SD	
Age: (years)					
< 25 years	23.46 ± 3.50	0.170	40.57 ± 4.71	0.001*	
25 - 30 years	23.52 ± 2.73		40.57 ± 6.00		
> 30 years	22.10 ± 3.28		34.81 ± 8.17		
Educational status:					
Illiterate / read and write	20.90 ± 3.85	0.001*	31.00 ± 5.97	0.001*	
Basic education	22.62 ± 2.84		39.08 ± 4.13		
Technical secondary	24.52 ± 1.95		43.48 ± 1.65		
Marital status:					
Single	23.32 ± 3.58	0.415	40.30 ± 5.32	0.039*	
Married	22.74 ± 3.06		37.20 ± 7.71		
Working system in the bakery:					
Morning	22.79 ± 4.04	0.661	37.68 ± 7.82	0.368	
Night	23.11 ± 2.73		39.06 ± 6.33		
Years of experience in the bakery:					
< 5 years	23.45 ± 3.47	0.327	40.48 ± 5.14	0.004*	
5 - 10 years	22.96 ± 3.08		38.78 ± 7.58		
> 10 years	22.10 ± 3.13		34.25 ± 7.59		

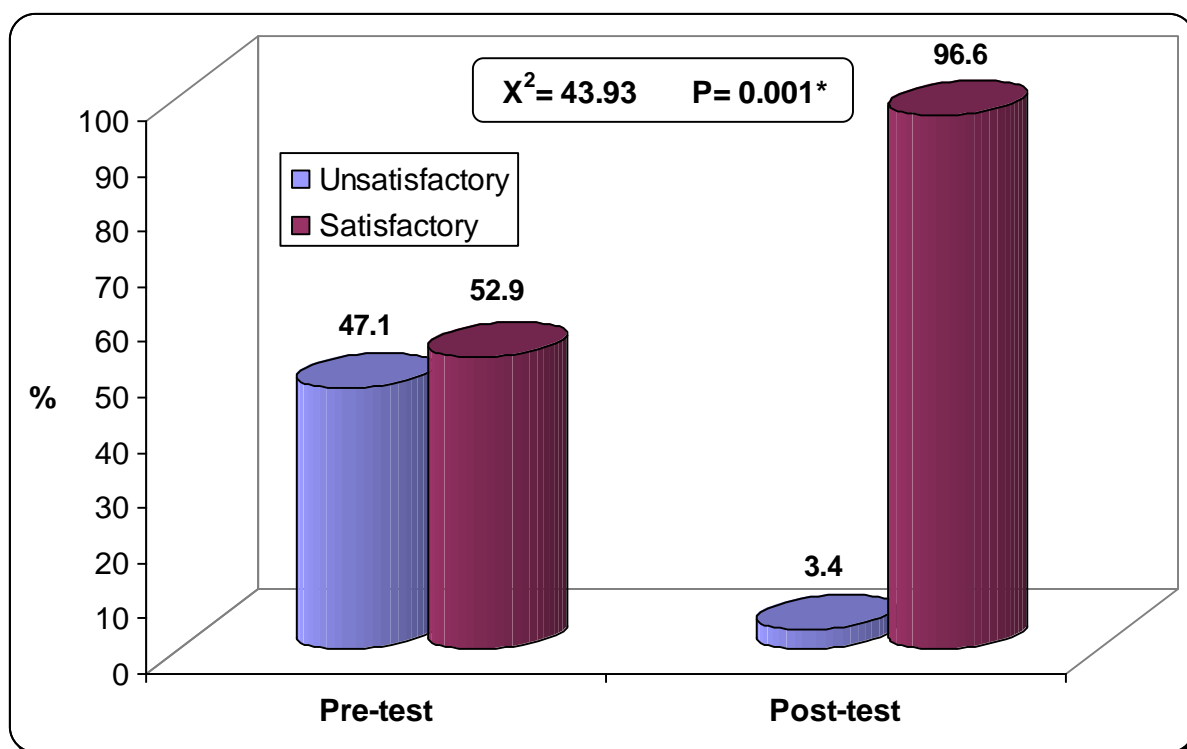
* Means there is statistical significant difference



< 50% Unsatisfactory

≥ 50% Satisfactory

Fig (1): Total knowledge score of studied bakeries' workers about prevention and control of occupational hazards in pre and post-tests at Assuit city, 2016.



< 50% Unsatisfactory

≥ 50% Satisfactory

Fig (2): Total practice score of studied bakeries' workers about prevention and control of occupational hazards in pre and post-tests at Assuit city, 2016.

Table (1) shows that two fifth (40.2 %) of the studied workers aged < 25 years. Regarding educational level, it was clear that slightly more than half of the studied workers (50.5 %) had technical secondary education level.

Table (2) clears that there are statistical significant differences in all items of first aid for burn between pre and post-tests except extinguish clothing fires immediately $P = (0.099)$.

Table (3) illustrates that there are a statistical significant differences for safety measures of bakeries' workers as gloves $P = (0.005^*)$, also earplugs, using handkerchief, using body mechanics $P = (0.000^*)$.

Table (4) shows that mean score of the studied workers were aged < 25 years was 23.46 ± 3.50 in pre- test; it was improved to 40.57 ± 4.71 in post- test. This was significantly better than in pre test. $P = (0.001^*)$. According to years of experience, it was found that the studied workers had years of experience < 5 years the mean score was 23.45 ± 3.47 ; in pre- test and it was improved to 40.48 ± 5.14 , respectively in post-test. This was significantly better than in pre test. $P = (0.004^*)$.

Fig (1): illustrates that there is a statistically significant difference between worker's knowledge in pre test and post- tests $P = (0.001^*)$.

Fig (2): clear that there is a statistically significant difference between worker's practice in pre and post- tests $P = (0.001^*)$.

Discussion .VI

One of the major problems facing the world is the occupational hazards among bakery workers. One of the sources of these hazards in the bakery is that workers are exposed to flour dust and others. Bakers can also experience respiratory irritation and other health problems. (Lee, 2013)

Regarding to workers age, the present study showed that two fifth of the studied workers aged < 25 years with the range (15.0 – 55.0) years. related to lack of interest of officials to work, which leads to forced labor in a young age because of high prices of goods and living conditions difficult to meet their needs. There

were statistically significant differences between worker's knowledge and practice with age in post test $P= (0.001^*)$.

These results agreed with **Yossif & Abd Elaal, 2011** who conducted a study in Benha University about prevention of health problems among bakery workers they found that age of the studied workers ranged between (20- > 40) years.

In addition the present study is in the same line with **Baatjies, 2013** who conducted a study in University of Cape Town about the occupational risk factors and interventions for baker's allergy and asthma among bakery workers who found that age of the studied workers ranged between (20-50) years.

As regard to workers education level, the current study showed that about half of the studied workers had secondary technical educational level, A statistical significant differences were observed between workers knowledge and practice with their education $P= (0.001^*)$ in pre and post- tests. Due to importance of educational program in raising workers knowledge and practice after implemented the program.

On the other hand these results disagreed with **Yossif & Abd Elaal, 2011** who found that around half of the studied workers had highly education and less than one fifth of them were intermediate education.

Concerning working system in the bakery the current study found that no statistical significant differences were observed between working system and their knowledge, as well as their practice before and after application of the program.

Moreover the current results disagreed with **Yossif & Abd Elaal, 2011** who reported that slight more than three quarters of the studied workers stated that type of work full time and more than one fifth reported type of work part time.

According to years of experience in the bakery the present study revealed that there were a statistical significant difference was observed between years of experience and their knowledge as well as their practice after application of the program. This because when the years of experience were increased the bakeries workers knowledge about occupational hazards and how to control it well be increased.

The current study were similar to **Baatjies, 2013** who found that the studied workers had years of experience in the bakery with the range

From 10 months to 25 years.

The present results in contrast with **Yossif & Abd Elaal, 2011** who found that two third of studied workers had years of experience in the bakery 5 years, and 10.0 % of them had 3 years of experience in the bakery.

According to attending training course. The results of the current study showed that slightly more than three quarters of them stated that no training course attending during working in the bakery. Because health and safety responsible not provide training course for bakery workers on how to avoid the risks that occur from work, using self protective devices, and first aid.

The present results are in the same line with **Yossif & Abd Elaal, 2011** who found that most of bakery workers did not receive any training courses about occupational hazards, knowledge of work requirement, how to use self protective devices, and first aid while less than one fifth of them received training courses about safety practice at emergency situations as how to use fire extinguisher.

Moreover, the current study disagreed with **Cohen & Colligan, 2014**, who conducted a study about Assessing occupational safety and health training, Columbia, Parkway Cincinnati. They reported that training is increasing workers knowledge of job hazards, and effecting safe work practices and other positive actions in a wide of work sites.

In addition the present study contracted with **Alexopoulos et al, 2009** who carried out study about Subjective risk assessment in the Greek and English bakeries. They found that British bakery provided training for employees on health and safety rules. Workers' training about occupational safety is seen as critical part of human resources management to perform their work efficiently and help them to make the work environment enjoyable and safe for the workers.

In addition the results of the present study showed that practice of worker's were unsatisfactory before the application of the program for first aid of burn. However, it was improved immediately after the application of the program. These results related to there are no first aid facilities and no personal protective equipment provided in all bakeries.

The present results are in the same line with **Yossif & Abd Elaal, 2011** who found that statistically significant differences between before and after the program regarding first aid of burn the mean is 4.480 ± 4.432 in pre test and it improved in post test to 9.880 ± 4.008 .

Concerning using safety measures of bakeries' workers. The current study revealed that there are statistical significant differences for safety measures of bakeries' workers as gloves also ear plugs, using handkerchief, using body mechanics before and after the program. Due to importance of educational program improved workers practice about safety measures after implement the program.

The present study is in the same line with **Yossif & Abd Elaal, 2011** who found that all of the studied workers had poor score of practice in all items of protective device; as use of apron, mask, head cap, except personal hygiene as hand washing before and after completion of working and using handkerchief before and after application of the program.

These results disagree with **Emmanuel and Sussan, 2014** who found that most of the studied workers frequently used apron followed by gloves while ear plugs were least worn. Workers are required to maintain good personal hygiene. Facilities are regularly inspected to ensure that equipment and employee comply with health and sanitation regulations.

The present results are illustrate that there is a statistically significant difference between worker's knowledge in pre test and post- tests $P= (0.001^*)$. Also These results clears that there is a statistically significant difference between worker's practice in pre and post- tests $P= (0.001^*)$.

VII. Conclusion:

The workers had unsatisfactory knowledge and practice in pre test. While after implementation the educational program their knowledge and practice were improved.

Recommendations:

- 1-Periodic health education programs should be implemented for refreshment the knowledge of bakery workers about prevention and control of health hazards.
- 2-Regular periodic medical examination for all bakeries workers is very important for early detection of any health problems and providing proper management.
- 3- First aid facilities and personal protective devices should be available in all bakeries.
- 4- Further studies should be conducted in occupational health program for bakery workers.

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