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Educational program about control and prevention of occupational health hazards among poultry farms' workers at Assiut District

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Abstract

Background: Poultry industry introduces practices, which create hazards and risks to workers.

Aim: To Implement and evaluate occupational health program about control and prevention of occupational health hazards among poultry farms' workers.

Design: A Quasi-experimental pretest-posttest research design carried out in the present study, within 14 poultry farms at Assuit district which selected randomly.

Methods: Convenient sample are used, for the worker. The study was contained two tools. Tool I Structured interview questionnaire developed by the researcher. It was structured into three parts,

Part 1: designed to assess personal characteristics.

Part 2: designed to assess medical history and current complains

Part 3: designed to assess workers' knowledge about: -Occupational health hazards, the second tool observational check list to assess workers practice.

Results: reveals that 1.4% and 50.4% of workers had good level of knowledge in pre and posttest respectively. While 14.2 and 78.6 had good level of practice in pre and posttest respectively. There was positive correlation between total knowledge and practice post application of educational program. There was a highly statistically difference in which $p<0.0001$.

Conclusion: there was strong positive correlation between total knowledge and practice posttest($r=0.001^{**}$).

Recommendation: Workers must wear appropriate personal protective equipment such as gloves, mask and aprons, and wearing special clean clothes, and disinfecting boots before and after visiting chicken houses.

Keywords: Knowledge, Practice, Poultry farms and Farms, workers

Introduction

Occupational Health and Safety (OHS) is a set of activities to prevent injuries and health problems to workers and to provide safe and healthy workplaces for workers. On the other hand, work places that view occupational health and safety as a investment with return are faced with a wide range of benefits, such as the reduction of absenteeism, the motivation of workers**,** enhancing the working risks, making the workplaces healthy and safe, increased productivity and the reduction of labour accident costs and establishing a positive safety culture so as to achieve a better occupational health and safety performance (Hughes & Ferrett, 2021).

Poultry workers involved in poultry breeding, farming, loading and transport of poultry birds processing facilities face a number of potential health hazards. Physical hazards are basically high level of noise from either birds or operating equipment such as fan, heater, among others, vibration and extreme temperatures. Mechanical hazards**,** caused by machines or mechanical work tools body positions and working conditions put strain on workers' body (Aderounmu *et al***,**.2020).

Workers in the poultry slaughterhouse are permanently exposed to health hazards. These have either a physical, chemical, mechanical, psychological or a biological nature. Proper identification of these hazards is needed to avoid accidents and to prevent workers from exposure to hazards in their work. These workers are subject to many occupational hazards through air, water, soil and work procedures (Elsaied *et al* 2021).

Human health risks may be associated with working in poultry farms. Respiratory problems arise from dusts, fumes, vapours and gases causing coughing, sneezing, asthma among others. Musculoskeletal problems, such as neck pain, back pain, general body pains, waist and thigh pains, leg pains, and wounds and cut among others**.** Gastrointestinal problems such as stomachache, diarrhea among others**.** Dermatological problems such as skin problems, rashes, dry skin, among others**.** Others health related problems that could affects poultry workers are cold, stress, among others. Some of the zoonotic diseases are Salmonellosis, Newcastle disease, Avian influenza, among others. Zoonoses are diseases that can be transmitted from poultry to humans and are public health threats worldwide (Yasmeen *et al*., 2020).

Significance of the study

Ocupational health hazards have been recognized for many years, affect workers in different ways, a result in occupational accidents, work-related diseases, and may lead to death. Worldwide, there are around 374 million occupational accidents and 160 million victims of work-related illnesses and more than 2.78 million deaths annually. Diseases related to work cause the most deaths among workers. In Egypt, there are about 15716 case have non-fatal occupational hazard by economic activity, 46 workers of them suffer from fatal injuries. At the same estimation there are found that the numbers of injuries per 100000 workers was 13.8 % for both sex male and female (International Labour Organization, 2021) [8].

Aim of the study
This study aims to evaluate the effect of educational program prevention and controlling of occupational health hazards among poultry farms workers at assuit district

Research hypotheses: To fulfill the aim of the study, the following hypotheses were formulated:

H1: The posttest- mean scores of occupational health hazards knowledge of poultry farms's workers who are exposed to educational program will be higher than the pretest –mean scores.

H2: The posttest - mean scores of safe practices of poultry farms's workers who are exposed to educational program will be higher than the pretest –mean scores.

Subjects and Method
Research design
A quasi -experimental research design was carried out in the present study.

Setting of the study
This study was conducted at 4 village from the total numbers 13 villages at Assuit district which selected by stratified random. From village number of licensed poultry farms in Assuit Agriculture Directorate it divided to two village in East (El. zzawya and Refaa) and two village in West city (Nagae Sabea and Masra'a) in Assuit district. Also, the poultry farm of the faculty of agriculture at assuit university

Sample
It included 25% from the total number of poultry farms in selected villages which selected randomly from each selected village it divided to (8) poultry farms from Elzzawya and Refaa. Also (5) from Nagae Sabae and Masra'a and (1) poultry farm Faculty of Agriculture, Assiut University. Convenient sample was used.

Tools of the study
Two tools were developed by researchers based on relevant literature

- **The first tool Interview questionnaire sheet***:* it developed by researchers included four part

1. Part 1
Included 7 questions about personal characteristics Such as address, name, age, marital status, educational level, nature of work in poultry, years of work**.**

2. Part 2
Included 17 questions about medical history such as past and present history as suffering from skin diseases, type of disease and its duration ophthalmic diseases type of disease and its duration respiratory diseases, type of disease and duration of disease, digestive system diseases type of disease and its duration, musculoskeletal diseases, type of disease and its duration and presence of other diseases**.**

3. Part 3
Included 17 questions about workers' knowledge as definition of occupational health , types of occupational health hazards, chemical hazards psychological effect of occupational hazards biological hazards, hazards from exposure to poultry dust, zoonotic diseases transmitted from chickens to human, signs and symptoms of sick birds, modes of transmission to human, , noise and how protected workers from these zoonotic diseases, causes of disease and sources of information about occupational health hazards

Scoring system of knowledge
The scoring system followed each correct answer given (1 degree) and incorrect given (0 degree) total scoring was calculated by summing up the correct answers and converting them into a percent score. Workers' knowledge classified as poor if the score was < 50% - fair if the score 50% - 70% and good knowledge if the score was > 70%. (Ahmed, *et al*,2022)

The second tool observational check list
Developed by Cahyadi, 2013 and researchers do some modification in some statement to observe practices such as wearing protective measure when dealing with birds and its wastes also when dealing with dead birds or sick birds. Wash hands and equipment after finish work. Use soap and disinfectant to cleaning hand and equipment. Disinfectant cage to transport birds. Wear special shoes. Wash hands after dealing with birds, wash hands after collect eggs, wash hands with soap and water after cleaning poultry. Wear head cover during work. It includes questions about protective measure. If they use the protective measure or not causes of refusing use personal protective equipment when handling birds, if changing special clothes at work, causes of refusing wearing special clothes if wash hands before and after dealing with poultry and tools with soap and disinfectants, also the ways of get rid of dead poultry.

Scoring system of practice
The responses were on two categories (done take 1degree and not done take 0 degree) total score was calculated by summing up degrees and converting them into a percent score. Workers' practices will determine as who estimated the answer by taking points as (poor ≤ 50% - fair =50% - 70% - good ≥ 70%) (Ahmed, *et al*,2022).

Validity
Validity for the study tools was revised by panel of five experts in the field of family and community health nursing in Assiut University. The tool was examined for content, coverage, clarity, relevance and applicability.

Reliability of tools
Reliability test was carried out by the researchers in order to examine internal consistency of the tools, by administration of the same tools to the same subjects under similar conditions two time. the value of Cronbach's alpha was = 0.859 for knowledge and 0.783 for practice.

Methodology
1. Administrative stage
An official letter approval was obtained from the Dean of the Faculty of Nursing Assiut University to the previous mentioned setting and an official letter approval was obtained from each mentioned setting which includes a permission to carry out the study in the selected areas. The Head of Assiut Agriculture Directorate offered a list of licensed poultry farms located in Assiut District, and issued an approval letters especially to mangers of the governmental farms to cooperate with the researchers.

2. Pilot study
Pilot study was carried out before starting data collection on 10% from the farm's workers. It aimed to test the clarity of the tools and to estimate the required time to fill the interview questionnaire. The pilot study was included in the study

3. Preparatory phase

it was conducted from first of June to mid of June 2021 Field coordination Co-researchers were selected to share in caring out research (data collection and educational program). Communicate with poultry farms workers to take their oral consent Training of co-researchers on data collection and program implementation four hours per day training course was administered and carried out by the researcher. They trained on administrating of questions in the field. It is included the pre-test and immediate post-test

4. Data collection Phase

Researchers and co researchers started collection pre-test from poultry farms before an implement educational program. The researchers started to collect data from mid of June until the end of November, 2021. Each interview took about (20-35) minutes to fill the questionnaire. They were divided into groups according to their number in each farm as the following Nagae Sabea (11 groups), Refaa (9 groups), Elzawya (10 groups), Masra'a (7 groups), and Faculty of Agriculture, Assiut University (4 groups) each group contain from 7-14 workers. Every day from 9 to 10 interviews of forms finished, interviews done at morning, and afternoon shift. Pretest was started, directly after finished from training co-researchers on data collection. Throughout the interview, every answer from the workers was recorded according to designed question in the form. The researchers and co-researchers were available to answer any question through data collection period.

The program phases

a. Assessment phase

This phase was done before the implementation of the program through the "pre-test" to assess the studied workers knowledge, practices and attitude about occupational health hazards

b. Planning Phase

The arrangement of conducting the program done during this stage. The sessions and time needed for the program decided. The study sample were divided into 47 group including from 7-14 participants in each group program given in 5 days per week 1session per day while 4^{th} and $5^{th\ days}$ two sessions for each group. The session content was regarding definition of occupational health hazard, importance of proper use of personal protective equipment, wear special clothes, eye protection, respiratory protection, good hygiene and decontamination procedure.

Methods of teaching:

- **Teaching place:** The sessions were carried in the poultry farms, according to farms facilities.
- **Media used:** picture and handout
- **Teaching methods:** it was included: lecture, discussion and brainstorm

c. Implementation phase

The educational program and posttest were carried out by researchers and co-researchers through period from the mid of June to the end of November 2021. Phase of delivery the educational program was implemented to each group. The program was implemented to all workers (500) in the study. The groups were received the educational program in 5 days from 1-2 session / day, 7 sessions for each group each session was consumed about 30- 45 minutes.

d. Evaluation phase

Posttest carried out immediately after implementing the educational program to assess the change in workers knowledge and practice

Ethical considerations

The research proposal was approved from ethical committee in the faculty of nursing. There is no risk for the study' workers during application of the research. Oral consent was obtained from workers who participated in the study, after explaining the nature and purpose of the study. Workers were assured that the data of their research will not be reused without second permission. Confidentiality and anonymity were assured.

Statistical analysis and scoring system

The obtained data reviewed, prepared for computer entry, coded, analyzed, and tabulated to evaluate the differences between the pretest and posttest. Descriptive statistics as the percentage mean ± and standard deviation was done-using computer program SPSS version 22. Chi-square test, Pearson correlation, fisher exact and Anova test used. It is considered significant when p-value less than 0.05.

Result

Table 1: personal data of poultry farms workers at Assiut District 2021(n=500) Result

Personal data	No. (500)	%
Age: (years)		
< 30	134	26.8
30 – 40	200	40.0
> 40	166	33.2
Marital status:		
Single	77	15.4
Married	423	84.6
Educational level:		
Illiterate	104	20.8
Basic education	164	32.8
Secondary	169	33.8
University	63	12.6
Current job at poultry: #		
Chicken feed	253	50.6

Clean farm	188	37.6
Collect eggs	179	35.8
Supervision of the poultry	173	34.6
Transport chicken to places of sale	207	41.4
Preparation chicken food	198	39.6
Connecting chickens to poultry cage	212	42.4
Supervision of the poultry	113	22.6

#more than one answer

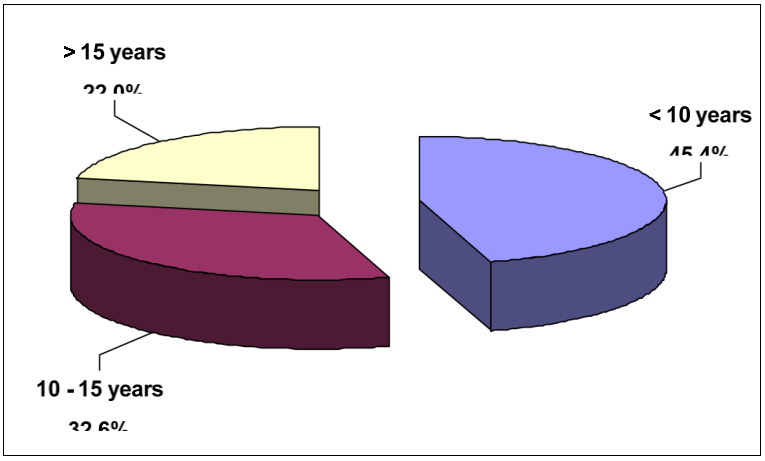

Fig 1 Years of experience of studied sample workers at poultry farms

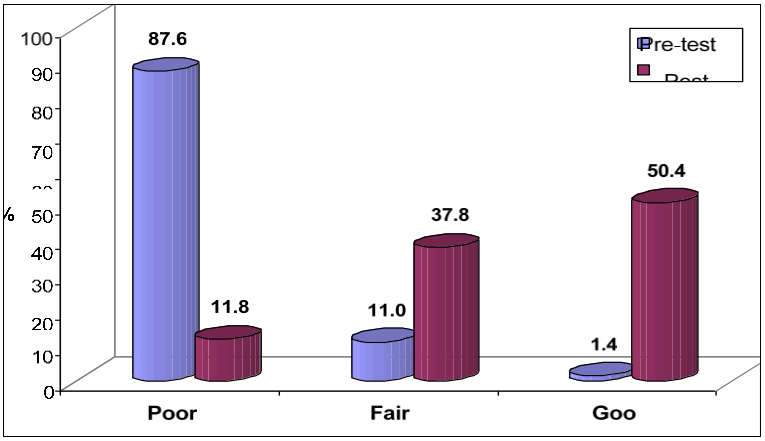

Fig 2: Total score of knowledge of studied samples about occupational hazards at pre and post at poultry farms, Assiut district, 2021

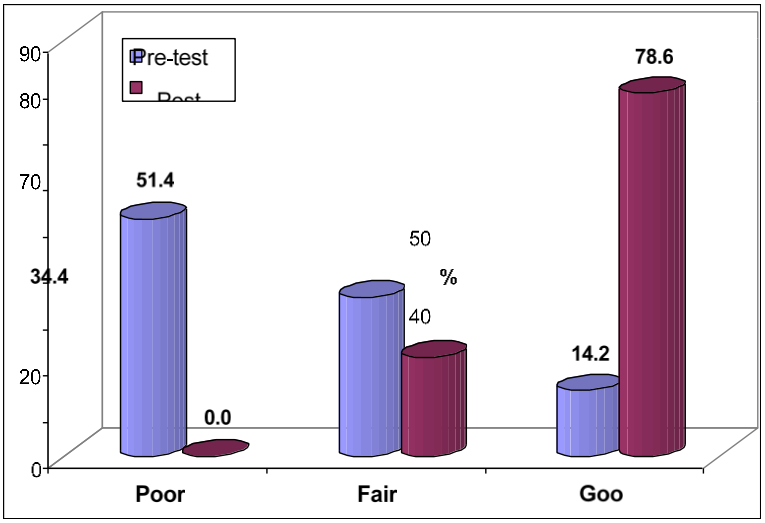

Fig 3: Total score of practice of studied samples about occupational hazards at pre and post at poultry farms, Assiut district, 2021(n=500)

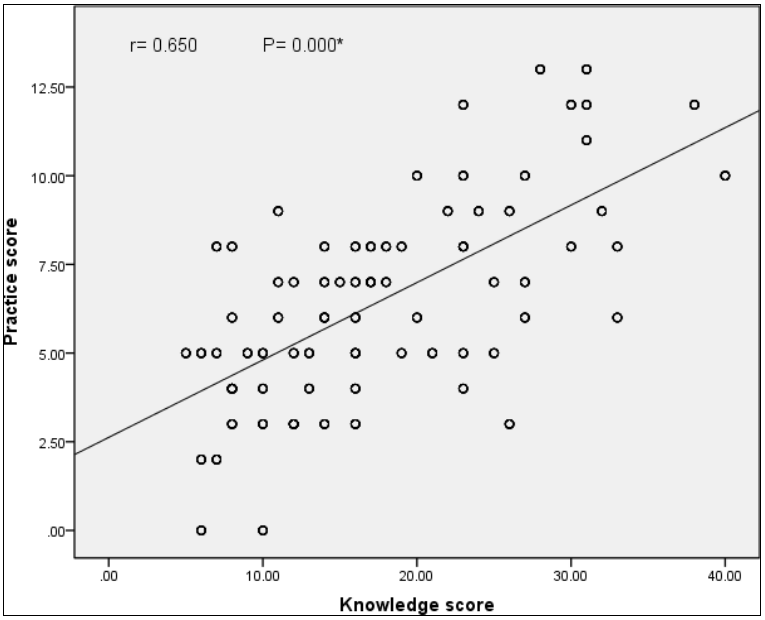

Fig 4: Correlation between knowledge score and practice score (pre-test)

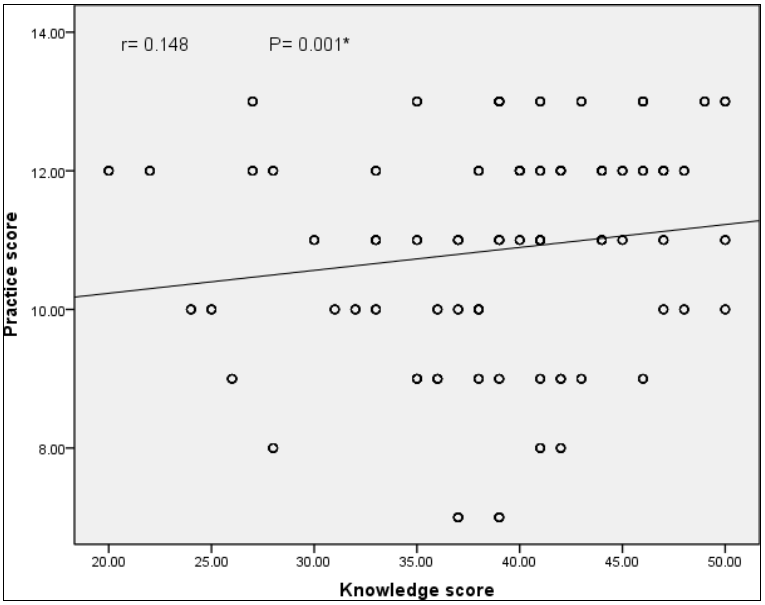

Fig 5: Correlation between knowledge score and practice score (post-test)

Table 3: Distribution of the studied workers knowledge about physical and chemical hazards in pretest and posttest at poultry farms, Assiut district, 2021 (n=500)

Knowledge	Pre-test (n= 500)		Post-test (n= 500)		P-value
	No.	%	No.	%	
Definition of occupational health:					
Incorrect	384	76.8	59	11.8	0.001*
Correct	116	23.2	441	88.2	
#Physical hazards from farm work:					
Don't know	136	27.2	0	0.0	0.001*
Noise	47	9.4	290	58.0	0.001*
Exposure to high temperature	103	20.6	374	74.8	0.001*
Exposure to moisture	113	22.6	363	72.6	0.001*
Low temperature	86	17.2	277	55.4	0.001*
Not enough light	12	2.4	232	46.4	0.001*
#Chemical hazards from farm work:					
Don't know	136	27.2	0	0.0	0.001*
Exposure to dust	117	23.4	269	53.8	0.001*
Exposure to detergents	244	48.8	403	80.6	0.001*
Exposure to disinfectant	215	43.0	417	83.4	0.001*
Exposure to pesticides	160	32.0	379	75.8	0.001*
Exposure to gases	103	20.6	297	59.4	0.001*

more than one answer Fisher exact test *it means there is statistically significant difference The test used chi squire between pretest & posttest.

Table 4: Distribution of the studied workers knowledge about psychological effect and biological hazards in pretest and posttest at poultry farms, Assiut district, 2021 (n=500)

Knowledge	Pre-test (n= 500)		Post-test (n= 500)		
#Psychological effect:	NO	%	NO	%	P-value
Don't know	166	33.2	0	0.0	0.001*
Tiredness	183	36.6	282	56.4	0.001*
Fatigue	210	42.0	355	71.0	0.001*
Depression	102	20.4	338	67.6	0.001*
#Biological hazards:					
Don't know	142	28.4	0	0.0	0.001*
Infected from birds	173	34.6	463	92.6	0.001*
Infected from contaminated food	117	23.4	319	63.8	0.001*
Infected from source of water	59	11.8	300	60.0	0.001*
Infected from sharp item	80	16.0	265	53.0	0.001*
Infected from direct contact with birds	164	32.8	391	78.2	0.001*
Infected from eggs	136	27.2	381	76.2	0.001*
Infected from waste	172	34.4	331	66.2	0.001*
Infected from feather	123	24.6	376	75.2	0.001*

more than one answer *it means there is statistically significant difference Fisher excat test The test used chi squire between pretest & posttest

Table 5: Relations between knowledge score of study participants in pretest and posttest with some personal characteristic at poultry farms, Assiut district, 2021

Personal data	Knowledge score	
	Pre-test	Post-test
	Mean ± SD	Mean ± SD
Age: (years)		
< 30	14.67 ± 7.13	35.99 ± 7.43
30 - 40	19.40 ± 8.83	39.55 ± 5.87
> 40	17.95 ± 8.43	40.05 ± 6.82
P-value	0.001*	0.001*
Marital status:		
Single	13.95 ± 7.13	33.68 ± 7.68
Married	18.33 ± 8.53	39.69 ± 6.24
P-value	0.001*	0.001*
Educational level:		
Illiterate	9.12 ± 3.16	33.15 ± 6.82
Basic education	13.69 ± 4.49	37.59 ± 4.93
Secondary	22.03 ± 5.95	40.91 ± 6.39
University	30.33 ± 5.71	45.33 ± 3.32
P-value	0.001*	0.001*
Years of experience:		
< 10	15.26 ± 7.09	36.78 ± 7.20
10 - 15	17.60 ± 9.10	38.93 ± 6.84
> 15	22.67 ± 7.98	42.63 ± 3.66
P-value	0.001*	0.001*

The test used chi squire between pretest & posttest and anova test *means there is statistically significant difference.

Table 6: Relation between total score of practice and the personal data in pre and post application of the educational program, Assiut district, 2021

Personal data	Practice score	
	Pre-test	Post-test
	Mean ± SD	Mean ± SD
Age: (years)		
< 30	5.72 ± 2.70	10.72 ± 1.47
30 - 40	7.03 ± 3.20	11.08 ± 1.72
> 40	6.42 ± 2.32	10.69 ± 1.30
P-value	0.001*	0.030*
Marital status:		
Single	5.10 ± 2.38	10.90 ± 1.49
Married	6.73 ± 2.85	10.85 ± 1.54
P-value	0.001*	0.793

Educational level:		
Illiterate	3.14 ± 1.47	9.57 ± 1.71
Basic education	6.30 ± 1.65	10.66 ± 1.23
Secondary	6.89 ± 1.81	11.14 ± 1.08
University	11.33 ± 1.50	12.70 ± 0.46
P-value	0.001*	0.001*
Years of experience:		
< 10	6.14 ± 2.73	10.89 ± 1.54
10 - 15	6.38 ± 2.98	10.72 ± 1.67
> 15	7.33 ± 2.72	10.98 ± 1.26
P-value	0.001*	0.360

The test used chi squire and anova between pretest & posttest *means there is statistically significant difference.

Table 1: Shows that the demographic data of the studied farms' workers at poultry farms. It was noticed that 40.0% of studied sample age ranged from 30- 40 yeaas old of them age ranged. In concerning to marital status, it was obvious that 84.6 of them were married. As regard to education of studied workers it was obvious that more than one third of the studied workers had secondary educational level follow by 32.8 of studied workers had basic education. Concerning to current job at poultry noticed that 50.6% of them chickens feed. And 41.4 of them work at transport chicken to places of sale 42.4 of studied workers connecting chickens to poultry cage.

Figure 1: Show that years of experience, 45.4% of studied workers had 10 years or less while 32.6% of them had from 10 to 15 years

Figure 2: Illustrates pre and posttest among studied samples in concern of their total knowledge about occupational hazards at poultry farms. Pre and post at poultry farms**.** 50.4 of workers had good level of knowledge post test. 87.6% of the workers had poor level of knowledge in pretest while 11.8% of them had poor level in post test and 50.4 of workers had good level of knowledge post test.

Figure 3: shows total score of practice of studied sample workers about occupational health hazards it was noted that 78.6%of studied samples had good practice in post test in which in pretest 51.4% had poor practice.

Figure 4: This figure illustrates the positive correlation between total knowledge and practice in posttest (r = 0.650) with statistically significant correlation (p= 0.000*) there were a statistically difference, in which, a strong positive correlation present

Figure 5: This figure illustrates the positive correlation between total knowledge and practice in post application of educational program (r = 0.148) with highly statistically significant correlation (p= 0.001**) there are a highly statistically difference, in which, a strong positive correlation present

Table 2: Illustrates comparison between pre and posttest among studied workers in concern of their knowledge about occupational hazards at poultry farms on pre-test 76.8% of them had incorrect definition of occupational hazards in which in posttest it improved to 88.2 of them had correct definition, respectively. There was statistically significance difference among pretest and posttest in which p<0.0001. As regarding to physical hazards on pre-test it was observed that 20.6 from them said that exposure to high temperature compare to on post test 74.8% mention the same answer.

Table 3: Shows that knowledge of the studied workers about psychological effect and biological hazards in pretest and posttest at poultry farms. As regarding to psychological effect in pretest it was observed that 42.0% of studied workers mention fatigue affect the health of workers posttest it improved to 71.0% of them mention the same answer. As regard to knowledge about biological hazards pretest 34.6% of them mention that the infection due to dealing with birds while it improved to 92.6% posttest respectively. There Were statistically significant differences between pretest and posttest in which P-value 0.001.

Table 4: There was no significant relation between the studied workers practice and their marital status post test P-value 0.793 also there is no significant relation between the studied workers practice and their years of experience posttest P-value 0.360 Indicates there were statistically significant relations between total practices level of studied workers and level of education P-value 0.001*

Discussion

There are various hazards in poultry environment that have great impact on health of the workers, the hazards range from accidental, physical, chemical and biological. In referral to demographic characteristic of the studied workers in the present study two fifth of studied workers aged between 30-40 years, one third of them more than 40 years and more than one fifth aged less than 30 years old. result in the same line with (Mahmoud, 2023) who studied occupational health hazards among workers in poultry farms and found that approximately two fifth of studied workers were between age 30 to 40 yearConcerning marital status of studied workers, the current study revealed that most of studied workers were married. From the research investigator point of view marriage usually affect stability of work and compliance of workers to work instructions. This result was supported by Oluyege & O Ojo, (2021), who studied "Occupational and Environmental Health Concerns on Unsafe Acts and Conditions in Poultry Production Sites in Ido-Osi, Ekiti State, Nigeria" (n=50) who reported that the most of workers were married. Reveals that level of education of studied workers, the current study revealed that approximately about one third of them had secondary education. This might be due to job requirements that don't need high qualification. This finding agreed with Iwuala *et al*., (2020), who studied "Respiratory Health Problems and Use of Personal Protective Equipment among Poultry Farm Workers in Owerri Senatorial Zone, Nigeria" (n=400) and found that more than half of workers had secondary education. This might be due to job

requirements that do not need high qualification. Regarding years of experience, it was observed that about one third of the studied sample had job experience from 10 to 15 years. This finding is in opposite line with (bello and oriol ,2020**)** who conducted a study level of health risks among poultry workers: Tuns Farm in Osogbo (Osun State), as well as Zartech and Vina in Ibadan (Oyo State). Who found that the majority of workers had job experience slightly more than tenth had years of experience from 6-10 years. Regarding the job roles of poultry farm workers, the current study revealed that half of them were involved in feeding the chickens, slightly more than two-fifths worked in transporting chickens to places of sale, and more than two fifths were responsible for placing chickens into poultry cages. This distribution aligns with findings (yero and Aminu 2023) [20] study conducted study about chicken production and labor employment in Kaduna State, Nigeria, which revealed that labor requirements vary significantly across different types of poultry operations. In terms of knowledge about physical hazards, the study found a notable improvement in workers' knowledge following the intervention. During the pre-test, about one-fifth of the poultry farm workers had correctly knowledge about physical hazard as potential exposure to high temperatures. This low level of knowledge is concerning, given that heat stress is a common and serious risk in poultry farm environments—particularly in enclosed or poorly ventilated facilities common in many regions. However, in the post-test, three quarters of the respondents were able to correctly recognize high temperature exposure as a physical health hazard. This significant increase suggests that the educational intervention provided during the study was effective in enhancing workers' knowledge. This finding aligns with earlier studies of (Mohammed *et al*., 2021; Tesfaye *et al*., 2022), who reported that knowledge-based interventions significantly improve the recognition of environmental and physical risks among agricultural workers. Given that prolonged exposure to high temperatures can lead to heat exhaustion, dehydration, and reduced productivity.

Concerning to knowledge of study workers about biological hazards the majority of study sample mention in pretest mention to exposure to disease from infection from bird's poultry farm workers are routinely exposed to a variety of biological hazards that can significantly affect their respiratory health, skin**,** gastrointestinal system, and overall well-being. These hazards mainly stem from the living conditions of birds, the handling of manure, litter, feed, and airborne contaminants present in enclosed farm environments.

As regard workers knowledge of chemical hazards, the current study shows that more than two fifth of study workers reported that chemical hazards due to exposure to disinfectant this result in the same line with (muotamed et al 2014) [18] who conducted study about knowledge, attitude and practice of poultry farms workers about occupational health hazards at Assiut district and found less than half of studied workers mention exposure to disinfectant from chemicals hazards

Concerning total score of study sample knowledge, the findings of present study showed that most of studied workers had poor total score of knowledge about occupational health hazards of work environment in pretest This finding might be due to lack of training courses about occupational health safety in poultry farms. This finding supported by Rizk *et al*., (2018**),** who reported that more than two third of workers had poor total score of knowledge about occupational health hazards.

The current study showed that, more than half of studied workers had poor practices level regarding safety measures to avoid occupational health hazards on pretest and more than three quarter of them had good practices regarding safety measures on posttest. These findings disagreed with Al-Sarray, (2018), who reported that most of worker had satisfactory total practice regarding preventive measures and tenth of them had unsatisfactory total practice regarding preventive measures. Before educational program, this might be due to lack of training courses and negligence of using personal protective equipment's in poultry farms.

Regarding to the correlation between total knowledge score and total practices score of workers studied pre-application of educational program and exposure to health hazards, the present study showed that there was statistically significant positive correlation between studied workers exposure to health hazards and their total practices level. (Mahmoud, 2023) who studied occupational health hazards among workers in poultry farms and who describes that there was highly statistically significant positive correlation between total knowledge score and total practices score while there was highly statistically significant correlation (p=0.001**) between total score knowledge and total score of practice

This means that workers who have better knowledge of occupational hazards are more likely to follow safer practices (e.g., wearing PPE, maintaining hygiene, reporting illnesses or injuries)

The present study showed that there were statistically significant relations between total knowledge level of studied workers about occupational health hazards and their level of education. These findings were in similarity with Hassan *et al*., (2021), who studied "Knowledge, Attitude, and Practices on Antimicrobial Use and Antimicrobial Resistance among Commercial Poultry Farmers in Bangladesh" (n= 420) and found that there was a statistically significant relation between knowledge of workers and level of education.

Conclusions

There was a highly statistically significant positive correlation between total knowledge score and total practices score among poultry workers, indicating that improving knowledge through education and training program could lead to better health and safety practices in poultry farm

Recommendation

Should be provide appropriate personal protective equipment such as gloves, mask and aprons. Wearing special clean clothes, and disinfecting boots before and after visiting chicken houses. Washing hands with soap and warm water before and after leaving the chicken house, and drying hands with disposable towels. Future researches are needed to assess perception of poultry workers about occupational health hazards, ensure safety and health measures of workers in poultry farms

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