

Occupational Health Hazards among Workers in Ambulance Center

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Abstract

Background: Ambulance work had a variety of biological, chemical, physical, an ergonomic and psychological hazard that cause dangers to workers during work. **Aim of study:** Was to assess the occupational health hazards among workers in Ambulance Center. **Research Design:** A descriptive research design was utilized to conduct this study. **Setting:** This study was conducted at Ambulance Center in Benha City, Qalyubia Governorate. The work in Ambulance Center was for 24hour shift/ day for 2days/ week. **Sample:** Convenient sample was used in this study for workers who attended at previous setting. The total number of ambulance vehicles was 15 ambulance vehicles distributed all over Benha City and its surroundings and it contained 100 ambulance workers. **Tools of data collection:** One tool was used: An structured interviewing questionnaire which consisted of four parts to assess workers' demographic characteristics and work experience, health problem of workers, knowledge about occupational health hazards and reported practices regarding preventive measures). **Results:** 40.0 % of studied workers their age were from 31 years to 40 years with mean age was 39.78 ± 8.19 , 74.0% of studied workers worked for 72 hours / week at Ambulance Center, 62.0% of them had muscle strain from Musculoskeletal system injuries as past medical history at last 6 months and 88.0% of them had fatigue as present medical history, 70% of them had good total knowledge scores related to occupational health hazards and 68.0% of studied workers had satisfactory practices regarding prevention of occupational health hazard. **Conclusion:** Less than one third of studied ambulance workers had average total knowledge scores regarding occupational hazards. More than two thirds of studied ambulance workers had satisfactory practices regarding prevention of occupational health hazards. There were highly statistically significant relations between the studied ambulance workers' total practices scores and their total knowledge scores. **Recommendations:** Developed and implemented training program for ambulance workers to improve their knowledge and practices toward prevention of occupational health hazards.

Key words: Ambulance Center, Occupational Health Hazards, Workers.

Introduction

Occupational health refers to the identification and control of the risks arising from physical, chemical, and other workplace hazards and placing and maintenance of the workers in an occupational environment adapted to physiological and psychological capabilities in order to establish and maintain

safe and healthy working environment (Macik-Frey et al., 2017).

Occupational health hazards are the risk for the health of a workers usually arising out of employment. Occupational health hazards are also refers to process or situation that causes accidents or disease at work place. Occupational health hazards are brought by

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unsafe work conditions and unsafe work behaviors. Workplace hazards or injuries are preventable with the use of appropriate occupational safety and health services (Ndejjo, 2017).

Occupational health hazards in the workplace can be found in a variety of forms, including chemical, physical, biological, psychological, and non-application of ergonomic principles. Because of the multitude of hazards in most workplaces and the overall lack of attention given to health and safety by many employers, work-related accidents and diseases continue to be serious problems in all parts of the world (Izadi & Piruznia, 2018).

The average number of ambulance workers injured annually worldwide between 2012 and 2021 was 29,411, with the greatest percentage occurring while responding to calls. According to the Centers for Disease Control and Prevention (CDCP) and National Institute for Occupational Safety and Health (NIOSH), there was not an appreciable decrease in the overall total of injuries sustained over these nine years. Sprain and strains as the result of overexertion and bodily reactions are the most prevalent of all injury types incurred by ambulance workers. Between 2012 and 2021, sprains and strains made up an annual average of 37% of the total injuries sustained by ambulance workers (National Institute for Occupational Safety and Health, 2021)

Ambulance workers are the primary providers whose response to medical and trauma related emergencies. They provide a disciplined and organized system, allowing a timely response of appropriately qualified health care workers. Ambulance workers provide also advanced life support including medical evaluation, treatment and stabilization of the critically ill and injured, respond to emergency rescue situations involving

potential loss of life or bodily injury, manage and direct patient care at the scene of a pre-hospital emergency, provide training, instruction and support to less trained personnel and protect the privacy of all patient information (Pentaris & Mehmet, 2019).

Ambulance workers face almost all workplace hazards that workers in other industries face that include psychological strain which result from constant contact with life or death circumstances and can cause nightmares, depression and severe anxiety along with interrupted sleep patterns. Ambulance workers face many risks and infection by viruses such as hepatitis B, C and Human Immunodeficiency Virus (HIV), which may lead to AIDS because the work involves dealing with sharp instruments and surgical needles, and frequent contact with bleeding from patients. They faced workplace violence when dealing with hostile patients and musculoskeletal injuries due to the nature of work that requires constant kneeling, bending, stretching and lifting (Law, 2018).

Community Health Nurse (CHN) can play a major role in protecting, preventing and improving the health of ambulance workers. CHN is one that is focused on health promotion, illness and injury prevention, and the protection of ambulance workers from occupational and environmental hazards. CHN prevent, diagnose and deal with occupational and environmental diseases and injuries that occur in Ambulance Center. CHN also provide rehabilitation of ambulance workers who have already been affected by a disease or injury to soften the impact of an ongoing illness or injury that has lasting effects (Georgiev et al., 2019).

Significance of the study

Egyptian Ambulance Organization is a huge entity with around 19,000 workers currently and it is planned to grow up till

30,000 workers spread all over 29 governorates. Egyptian Ambulance Organization reported that 69% of ambulance workers exposed to musculoskeletal disorder, 92.5% exposed to biological hazard, 58.2% exposed to verbal violence, compared to physical violence 15.7%. The most reported reasons for violence were from waiting time that patient and family expectations not being met (**Egyptian Ambulance Organization, 2019**).

Aim of the study

The aim of this study was to assess the occupational health hazards among workers in Ambulance Center.

Research Questions

1. What are the worker's knowledge related to occupational health hazards in Ambulance Center?
2. What are the workers' reported practices regarding prevention of occupational health hazards in Ambulance Center?
3. What are the worker's health problems which faced at the last 6 months in Ambulance Center?
4. Is there a relation between demographic characteristics of workers and knowledge and reported practices related to occupational health hazard?
5. Is there a relation between worker's knowledge and their reported practices in Ambulance Center?

Subject and Methods

Research Design:

A descriptive research design was used in carrying out this study. Descriptive research design is a type of research design that aims to obtain information to systematically describe a phenomenon, situation, or population. More specifically, it helps answer the what, when, where, and how questions regarding the research problem, rather than the why.

Setting:

This study was conducted at Ambulance Center in Benha City, Qalyubia Governorate and the surrounding ambulance points that include the following points: Warwaraa, Bata, New Benha, Kafr shokr, Camgarah, Meet El-sebaa, Ezbet El-soque, Al-Ramlah, Sandanhour. The work in Ambulance organization was for 24hour shift/ day for 2days/ week.

Sampling:

Convenient sample was used in this study for workers who attended at previous setting. The total number of ambulance vehicles was 15 ambulance vehicles distributed all over Benha City and its surroundings and it contained 100 ambulance workers. **According to inclusion criteria:** The sample include only ambulance workers who working on ambulance car.

Tools of data collection:

One tool used to collect data: An structured interviewing questionnaire.

The investigator designed questionnaire based on literature review, and revised by supervisors, it was written in simple clear Arabic language. It consisted of the following four parts:

First Part: a) Demographic characteristic of Ambulance workers which included 7 questions about (age, residence, educational level, marital status, smoking, family type and monthly income).

b) Working experience of Ambulance workers which included 4 questions about (number of working hours, previous years of working experience at Ambulance Center, number of training courses and name of training courses).

The second part: - Health problem of workers in Ambulance Center which included: a) The past medical history of workers at last 6 months related working in Ambulance Center which included 6 questions about (musculoskeletal system injury, blood-borne

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diseases, skin diseases, ear diseases, respiratory system problems and psychological problems). b) The present medical history of workers related working in Ambulance Center which included 12 questions about (hypertension, hepatitis C virus, hepatitis B virus, bronchitis, tuberculosis or pulmonary tuberculosis, chronic cough, covid 19, fractures and sprains, herniated disc, difficulty in mobility, fatigue and depression).

Third part: It consisted of worker's knowledge about occupational health hazards in Ambulance Center which included 9 questions such as (meaning of occupational health hazards, types of occupational health hazards, physical health hazards, chemical health hazards, biological health hazards, psychological health hazards, an ergonomic health hazards, health problems which result from working at the Ambulance Center and methods of prevention of occupational health hazards)

Scoring system for the knowledge items adapted as follows:

The scoring systems for ambulance workers' knowledge was calculated as the follows (2) scored for the correct and complete answer, while (1) scored for the correct and incomplete answer, and (0) for don't know for each question of knowledge. The scores of items were summed up and the total was divided by the number of the items, these scores were converted into percent score. The total knowledge scores were considered good if the score of the total knowledge $>75\%$ (>13 point), considered average if it is equals $50 \leq 75\%$ ($9 \leq 13$ point) and considered poor if it is less than 50% (9 point).

Fourth part: Reported practices of ambulance workers regarding preventive measures that included 7 items (hand washing, using protective clothing, how to reduce exposure to biological hazards, how to reduce exposure to an ergonomic hazards, how to

reduce exposure to physical hazards, how to reduce exposure to chemical hazards and how to reduce exposure to psychological risks).

Scoring system of worker's reported practices of prevention of occupational health hazards:-

The scoring system for ambulance workers' practices was calculated as the follows: Each practice has 2 levels of answer (1) score for done and (0) score for not done. The scores of items were summed up and the total was divided by the number of the items, giving mean score for the part. These scores were converted into percent score. The total practices scores were considered satisfactory if the score of the total practices more than 60% (>27) and considered unsatisfactory if it is less than 60% (<27).

Content validity and reliability of the tools:-

The tools were reviewed for comprehensiveness, appropriateness and legibility by three experts of Faculty of Nursing Staff, Benha University from the Community Health Nursing Specialties. The expertes ascertained the face and content validity of the tools. The reliability was done by Cornbrash's Alpha coefficient test which revealed that each of the two tools consisted of relatively homogeneous items as indicated by the moderate to high reliability of each tool. The internal consistency of knowledge was 0.850, and practice was 0.743.

Ethical consideration:

Permission has been obtained orally from each worker before conducting the interview and given a brief orientation to the purpose of the study. They were also reassured that all information gathered would be confidential and used only for the purpose of the study. No names were required on the forms to ensure anonymity and confidentiality. They were also informed about their right to withdraw at any time from the study without giving any reasons

Pilot study:

A pilot study was conducted on 10% of the studied workers (10 workers) to test the content, applicability and simplicity of the tool using the interviewing questionnaire. Based on the pilot study the tools were organized. Organization of the tool included rephrasing, rearrangement of some questions. After refinement and organization final forms of the tool were developed. This pilot study was carried in two weeks before starting the study and those who shared in the pilot study were included in the studied sample

Field work

Data were collected over 3 months from the start of October of 2021 to end of December 2021; the study was conducted by the investigator for the studied sample in the selected settings. The investigator visited the main Ambulance Center and the surrounding ambulance points that includes the following points: Warwaraa, Bata, New Benha, Kafr shokr, Camgarah, Meet El-sebaa, Ezbet El-soque, Al-Ramlah, Sandanhour. The investigator visits the previous setting for 2 days/week (Saturday/Tuesday) from 10:00 am to 2:00 pm because these days are available to researcher. The investigator explained the purpose and importance of the study to the workers and obtained their consent. The investigator collected data from the workers. The average number of interviewed workers was between 4-5 workers/day depending on their response to the interviewers, each interviewed worker takes about 30 to 40 minutes to fill the sheet depending upon their understanding and response.

Statistical analysis:

Computerized data entry and statistical analysis were fulfilling scored using Statistical Package for Social Science (SPSS), version (25). Descriptive statistics were first applied (percentage) then other statistical test such as, Chi-square and using mean.

Statistical significance was considered:

- Significant result when P- value < 0.05.
- Highly significant result when P- value <0.001.
- Non- significant result when P-value>0.05.

Results

Table (1): Shows that; 40.0 % of studied workers their age were from 31 years to 40 years with mean age was 39.78±8.19, 62.0% of them were living in rural area, and 48.0% of them had nursing technician diploma. As regards marital status 96.0% of studied workers were married, 64.0% of them were smokers, 74.0% of them had nuclear family and 52.0% of them had enough monthly income.

Table (2): Shows that 62.0% of studied workers in Ambulance Center had muscle strain, 76.0 of them didn't have any blood borne diseases, and 36.0% of them had skin irritation regarding past medical history for the last 6 months. As well as, 48.0% of studied workers had ear infection, 30.0%, of them had nasal allergy and sinusitis, and 80.0% of them had fatigue regarding past medical history for the last 6 months.

Table (3): Shows that 90.0% of studied workers had correct and complete answer regarding biological health hazards associated with working in Ambulance Center, 38.0% of them had correct and incomplete answer about types of occupational health hazards associated with working in Ambulance Center, and 22.0% of them didn't know the psychological health hazards in Ambulance Center.

Table (4): Shows 82.0% of studied workers had satisfactory practices about how to reduce exposure to biological health hazards, 67.0% of them had satisfactory practices regarding hand washing, and 64.0% of them had satisfactory practices about how

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to reduce exposure to ergonomic health hazards.

Table (5): Represents that there was highly statistically significant relations between the studied workers' total knowledge scores and their educational level when P value >0.001 , while there were statistical significant relations between the studied workers' total knowledge scores and their age and residence when P value < 0.05 .

Table (6): Reveals that there were no statistical significant relations between the studied workers' total reported

practices score and their demographic characteristics.

Table (7): Reveals that there were highly statistically significant relations between the studied ambulance workers' total practices scores and their total knowledge scores.

Figure (1): Illustrates that 70.0% of studied workers had good total knowledge scores regarding occupational health hazards and 30.0% of them had average total knowledge scores regarding occupational health hazards in Ambulance Center.

Table (1): Percentage distribution of studied workers regarding their demographic characteristics (n=100).

Demographic Characteristics	%
Age	
20-30 years	18.0
31-40 years	40.0
41-50 years	28.0
50 years and more	14.0
Mean \pmSD	39.78\pm8.19
Residence	
Rural	62.0
Urban	38.0
Educational level	
Nursing technician diploma	48.0
Higher Institute or University education	52.0
Marital status	
Married	96.0
Widowed	2.0
Divorced	2.0
Smoking	
Smoker	64.0
Non-smoker	36.0
Family type	
Nuclear family	74.0
Extended family	26.0
Monthly income	
Enough	52.0
Not enough	48.0

Table (2): Percentage distribution of studied workers regarding their Past medical history at last 6 months (n=100).

Past medical history	%
*Musculoskeletal system injuries	
Fractures	14.0
Sprains and bruises	58.0
Herniated disc	32.0
Muscle strain	62.0
Accidents and injuries	16.0
*Blood-borne diseases	
Hepatitis C virus	24.0
Nothing	76.0
*Skin diseases	
Dermatitis	30.0
Skin allergy	28.0
Skin irritation	36.0
Dry skin	6.0
*Ear diseases	
Ear infection	48.0
Discharge from the ear	46.0
Hearing loss	4.0
Hearing impairment	2.0
*Respiratory system problems	
Nasal allergy and sinusitis	30.0
Bronchitis	28.0
Bronchial asthma	28.0
Chronic phlegm	18.0
Pneumonia	2.0
*Psychological problems	
psychological disturbances after dealing with major accidents	8.0
Sleep disturbance	68.0
Depression	12.0
Anxiety and stress	74.0
Alcoholism	2.0
Fatigue	80.0

Table (3): Percentage distribution of studied workers regarding their knowledge about occupational health hazards at Ambulance Center (n=100).

Items of workers' knowledge	Correct & complete answer	Correct & incomplete answer	Don't know
Meaning of occupational health hazards	72.0	28.0	0.0
Types of occupational health hazards	62.0	38.0	0.0
Physical health hazards	54.0	36.0	10.0
Chemical health hazards	24.0	68.0	8.0
Biological health hazards	90.0	10.0	0.0
Psychological health hazards	72.0	6.0	22.0
An ergonomic health hazards	83.0	17.0	0.0
Health problems which result from working at Ambulance Center	82.0	18.0	0.0
Method of prevention of occupational health hazards	64.0	36.0	0.0

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Table (4): Percentage distribution of studied workers regarding their total reported practices items to prevent occupational health hazard in Ambulance Center (n=100).

Items	Satisfactory	Unsatisfactory
	%	%
Hand washing	67.0	33.0
Using protective clothing	60.0	40.0
How to reduce exposure to biological hazards	82.0	18.0
How to reduce exposure to ergonomic hazards	64.0	36.0
How to reduce exposure to physical hazards	72.0	28.0
How to reduce exposure to chemical hazards	68.0	32.0
How to reduce exposure to psychological hazards	74.0	26.0

Table (5): Relation between studied workers total knowledge scores and their demographic characteristics

Demographic characteristics	Total knowledge score					P-value
	Average(n= 30)		Good (n=70)		X ²	
	No	%	No	%		
Age						
20-30 years	4	13.3	14	20.0	15.117	<0.05*
31-40 years	20	66.7	20	28.6		
41-50 years	6	20.0	22	31.4		
50 years and over	0	0.0	14	20.0		
Residence						
Rural	14	46.7	48	68.6	4.277	<0.05*
Urban	16	53.3	22	31.4		
Educational level						
Nursing technician diploma	24	80.0	24	34.3	17.582	<0.001**
Higher institute or university education	6	20.0	46	65.7		
Marital status						
Married	28	93.3	68	97.1	5.556	0.062
Widowed	0	0.0	2	2.9		
Divorced	2	6.7	0	0.0		
Monthly income						
Enough	20	66.7	32	45.7	3.694	0.055
Not enough	10	33.3	38	54.3		

Table (6): Relation between studied worker's total reported practices scores and their demographic characteristics

Demographic characteristics	Total reported practices scores				Chi-square	
	Unsatisfactory (n= 32)		Satisfactory (n=68)		X ²	P-value
	No	%	No	%		
Age						
20-30 years	6	18.8	12	17.6	4.691	0.196
31-40 years	17	53.1	23	33.8		
41-50 years	7	21.9	21	30.9		
50 years and over	2	6.3	12	17.6		
Residence						
Rural	18	56.3	44	64.7	0.66	0.416
Urban	14	43.8	24	35.3		
Educational level						
Nursing technician diploma	17	53.1	31	45.6	0.495	0.482
Higher institute or university education	15	46.9	37	54.4		
Marital status						
Married	32	100.0	64	94.1	1.961	0.375
Widowed	0	0.0	2	2.9		
Divorced	0	0.0	2	2.9		
Monthly income						
Enough	15	46.9	37	54.4	0.495	0.482
Not enough	17	53.1	31	45.6		

Table (7): Statistically relation between studied ambulance workers' total knowledge scores and total their practices scores

Total practices score	Total knowledge score				X ²	P-value
	Average (n= 30)		Good (n=70)			
	No	%	No	%		
Unsatisfactory (n=32)	23	76.7	9	12.9	39.294	<0.001**
Satisfactory (n= 68)	7	23.3	61	87.1		

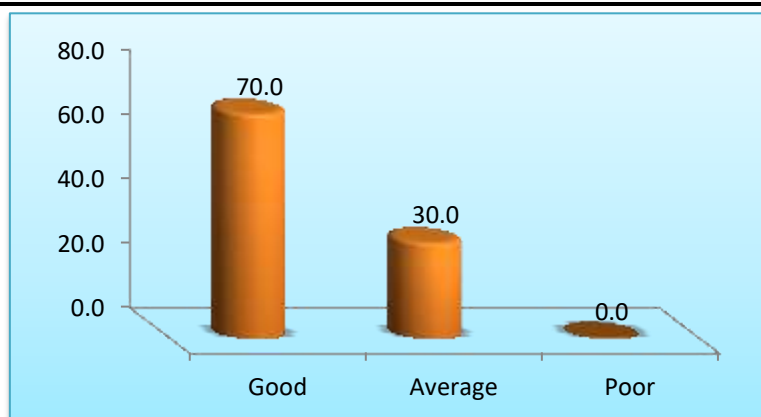


Figure (1): Percentage distribution of studied workers regarding their total knowledge scores (n=100).

Discussion

Occupational health is important because work plays a central role in people's lives, since most workers spend at least eight hours a day in the workplace. Occupational health hazards are risks associated with working in specific occupations. Occupational health hazards in Ambulance Center are classified on the basis of biological, chemical, physical, psychological and ergonomic properties. The ambulance service is ideally placed to be part of the first line in the continuum of health care, and can significantly contribute to 'treat and transfer' or 'treat and leave' programs (**National Association of Safety, 2019**).

According to demographic characteristics of studied ambulance workers. The present study showed that two fifth of the studied ambulance workers their age were from 31-40 years with mean age was 39.78 ± 8.19 years and less than two thirds of them were living in rural area. These findings agreed with **Ahmed et al. (2017)**, who studied " Psychological hazards among emergency medical responders: A cross sectional comparative study in Cairo City, Egypt" (n=307), who found that two fifth of the studied workers their age were from 31-40 years and more than one half of them were living in rural area.

The current study revealed that less than half of studied ambulance workers had nursing technician diploma. This finding agreed with **Donaghy (2018)**, who studied "Higher education for ambulance workers why? in Britain" (n=123), who found that more than two fifth of studied ambulance workers had nursing technician diploma. This might be due to workers graduated from nursing technician diploma to be highly efficient and respond quickly to an emergency situation.

The current study revealed that most of studied ambulance workers were married, less than three quarters of them had nuclear family and more than half of them had enough

monthly income. These findings agreed with **Kerai (2017)**, who studied " Post-traumatic stress disorder and its predictors in emergency medical service personnel: A cross-sectional study from Karachi, Pakistan "(n= 518), who found that most of studied personnel were married, less than three quarters of them had nuclear family and more than two fifth of them had enough monthly income.

The present study showed that slightly less than two thirds of studied ambulance workers were smokers. This finding agreed with **Aljerian et al. (2018)**, who conducted study on "The prevalence of musculoskeletal disorders among emergency medical service personnel in Saudi Arabia, Riyadh" (n= 180), who found that more than two thirds of studied ambulance workers were smokers. This might be due to majority of men are smokers.

The current study revealed that less than two thirds of studied ambulance workers had muscle strain regarding past medical history for the last 6 months. According to **Friedenberg et al. (2020)**, who studied "Work-related musculoskeletal disorders and injuries among ambulance workers and paramedics in Japan" (n= 943), who found that two thirds of studied ambulance workers had muscle strain. This might be due to nature of their work depending on handling and carrying the patient.

The current study revealed that more than three quarters of studied ambulance workers didn't have any blood borne diseases. This result agreed with **Thomas et al. (2017)**, who studied "Everyday dangers the impact infectious disease has on the health of ambulance workers in Cambridge University" (n= 153), who found that more than three quarters of studied ambulance workers didn't have blood borne diseases. This might be due to majority of studied workers wear personal protective equipment while dealing with patients to keep themselves.

The current study revealed that more than one third of studied ambulance workers had skin irritation. This result agreed with **Aalto-Korte et al. (2021)**, who studied "Allergic contact dermatitis and other occupational skin diseases in health care workers in the finnish register of occupational diseases in Australia" (n= 528), who found that more than one third of studied ambulance workers had skin irritation. This might be due to ambulance workers exposure to a variety of cleansers during hand washing and wearing latex in dealing with patients.

The current study revealed that more than two fifth of studied ambulance workers had ear infection regarding past medical history for the last 6 months. This result agreed with **Tanaprakob & Singlee (2017)**, who studied "Prevalence of noise-induced hearing loss in ambulance workers in Bangkok" (n= 199), who found that more than two fifth of studied ambulance workers had ear infection. This might be due to studied workers didn't wear ear plugs while operating ambulance siren and also exposed to loud noise continuously.

The current study revealed that majority of studied ambulance workers had fatigue. This result consistent with **Patterson et al. (2018)**, who conducted study on "Association between poor sleep, fatigue, and safety outcomes in ambulance workers in United States" (n= 547), who found that majority of studied ambulance workers had fatigue. This might be due to worker's nature of shift work and the associated occupational activity.

The present study showed that most of studied ambulance workers had correct and complete answer regarding biological health hazards associated with working in Ambulance Center. This finding agreed with **El-Deh & Ewis. (2018)**, who studied "Assessment of Egyptian emergency medical technicians' level of education and training in managing mass casualties and disaster events

in Egypt" (n= 177), who found that majority of studied workers had correct and complete answer regarding biological health hazards associated with work place. Also this finding disagreed with **Garus-Pakowska et al. (2017)**, who conducted study on "Awareness of the risk of exposure to infectious material and the behaviors of Polish paramedics with respect to the hazards from blood-borne pathogens in Poland" (n= 165), who found that one third of studied ambulance workers had correct and complete answer regarding biological health hazards. This might be due to majority of studied ambulance workers had training courses on infection control.

The present study showed that more than one fifth of studied ambulance workers didn't know psychological health hazards in Ambulance Center. This finding agreed by **Hegg-Deloye et al. (2017)**, who studied "Current state of knowledge of post-traumatic stress, sleeping problems, obesity and cardiovascular disease in ambulance workers in Quebec" (n= 289), who found that that less than one quarter of studied ambulance workers didn't know psychological health hazards.

Regarding workers' total practices items to prevent occupational health hazard in Ambulance Center. The present study revealed that the majority of studied ambulance workers had satisfactory practices about how to reduce exposure to biological health hazards. This finding agreed with **Cash et al. (2021)**, who reported that more than three quarters of studied workers had satisfactory practices about prevention of biological health hazards. This might be due to workers taking courses on infection control measures.

The present study revealed that less than two thirds of studied ambulance workers had satisfactory practices about how to reduce exposure to ergonomic health hazards (table 4). This finding agreed with **Hignett et al. (2017)**, who found that more than half of

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workers had satisfactory practices to word ergonomic hazards. This might be due to workers following instruction to reduce ergonomic health hazards.

The present study represented that there was highly statistically significant relations between the studied ambulance workers' total knowledge scores and their educational level. This finding agreed with **El-Deh &Ewis. (2018)**, who found that there were highly statistically significant relations between the studied workers' total knowledge scores and their educational level. This might be due to the education level may affect on workers ' ability to acquire knowledge.

The present study represented that there were statistical significant relations between the studied workers' total knowledge scores and their age and residence. This finding agreed with **Lawn (2020)**, who found that there were statistical significant relations between the studied workers' total knowledge scores and their age and residence. This might be due to age and residence may affect on workers ' ability to acquire knowledge.

The present study revealed that there were no statistical significant relations between the studied workers' total reported practices score and their demographic characteristics. This finding disagreed with **Zaki et al. (2021)**, who found that there were statistical significant relations between the studied workers' total reported practices score and their demographic characteristics.

The present study revealed that there were highly statistically significant relations between the studied ambulance workers' total practices scores and their total knowledge scores. This finding agreed with **Stone et al. (2019)**, who found that there were highly statistically significant relations between the studied ambulance workers' total practices scores and their total knowledge scores. This

might be due to knowledge may effect on workers' total practices.

As regard total knowledge scores. The present study revealed that less than three quarters of studied ambulance had good total knowledge scores regarding occupational health hazards. This finding was in the same line with **Burkle (2017)**, who studied "Knowledge and attitudes of ambulance personnel in Australia" (n= 789), who found less than three quarters of studied ambulance had good knowledge scores regarding occupational health hazards. This might be due more than one half of studied ambulance workers had higher institute or university education which help them in acquiring knowledge.

Conclusion

Less than two thirds of studied workers had good total knowledge scores regarding occupational hazards in Ambulance Center and less than one third of studied ambulance workers had average total knowledge scores regarding occupational hazards. More than two thirds of studied ambulance workers had satisfactory practices regarding prevention of occupational health hazard in Ambulance Center.

Less than two thirds of the studied ambulance workers had had muscle strain regarding past medical history at last 6 months in Ambulance Center while majority of them had fatigue regarding present medical history in Ambulance Center. There was a highly statistically significant relation between the studied workers' total knowledge scores and their educational level. There were there were no statistical significant relations between the studied workers' total reported practices score and their demographic characteristics. There were highly statistically significant relations between the studied ambulance workers' total practices scores and their total knowledge scores.

Recommendations

- ❖ Develop and implement training program for ambulance workers to improve their knowledge and practices toward prevention of occupational health hazards.
- ❖ Make regular periodic checkup for all ambulance workers for early detection of any health problems.
- ❖ Advanced lifting devices should be available to all first aid point in Ambulance organization.
- ❖ Further studies need to be applied on the large sample size of ambulance workers to prevent occupational health hazards.

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مخاطر الصحة المهنية بين العاملين في مركز الإسعاف

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تحتوي المخاطر الصحة المهنية علي اشكال متنوعة من المخاطر ، وتشمل المخاطر الكيميائية والفيزيائية والبيولوجية والنفسية والبدنية، وربما يواجه العاملين في مركز الإسعاف مخاطر متعددة مثل الأمراض المعدية، والحوادث، أمراض العضلات والعظام، أمراض الجهاز التنفسي، أمراض السمع، أمراض الدورة الدموية، الاضطرابات المرتبطة بالإجهاد وغيرها. وتهدف الدراسة إلي تقييم مخاطر الصحة المهنية بين العاملين في مركز الإسعاف ببنها وأجريت هذه الدراسة بمركز الإسعاف بمدينة بنها بمحافظة القليوبية والنقاط التابعة له وهي (ورورة، بطا، كفر شكر، جمجرة، عزبة السوق، الرملة، ميت السباع، بنها الجديدة، سندنهور) وقد تم استخدام العينة الملائمة في هذه الدراسة لاختيار العاملين حيث بلغ عددهم ١٠٠ مسعف. كشفت النتائج ان لدى أقل من ثلثي العاملين في مركز الإسعاف لديهم معلومات جيدة فيما يتعلق بالمخاطر المهنية في مركز الإسعاف وأن أكثر من ثلثي العاملين لديهم ممارسات مرضية فيما يتعلق بالوقاية من مخاطر الصحة المهنية. كما أوضحت الدراسة أن هناك علاقات ذات دلالة إحصائية عالية بين معلومات العاملين في مركز الإسعاف والمستوى التعليمي لهم وأعمارهم ومكان إقامتهم ولا توجد علاقة ذات دلالة إحصائية بين ممارسات العاملين بالإسعاف وخصائصهم الديموغرافية و كانت هناك علاقات ذات دلالة إحصائية عالية بين ممارسات العاملين بالإسعاف ومعلوماتهم. كما أوصت الدراسة بأهمية تطوير وتنفيذ برنامج تدريبي للعاملين في مركز الإسعاف لتحسين معلوماتهم وممارساتهم تجاه الوقاية من مخاطر الصحة المهنية وأيضاً فحص دوري منتظم للعاملين بالإسعاف من أجل الإكتشاف المبكر للمشاكل الصحية.