

# Effect of First Aid Training Program on Construction Workers' Self-Efficacy In Egypt

MAHA IBRAHIM EL-BAYOUMY ALI<sup>1</sup>, NAGAT SAID HABIB<sup>2</sup>, HEBA MAGDY SHARAA<sup>3</sup>

<sup>1</sup>Assistant Lecturer, Community Health Nursing, Faculty of Nursing, Cairo University

<sup>2</sup>Prof. of Community Health Nursing, Faculty of Nursing, Cairo University

<sup>3</sup>Assisst.Prof of Community Health Nursing, Faculty of Nursing, Cairo University

Corresponding author: Maha Ibrahim El-Bayoumy Ali, Assistant Lecturer, Community Health Nursing, Faculty of Nursing, Cairo University.

Email address: maha\_ibrahim\_ali@cu.edu.eg, Telephone number: 01013871408

## ABSTRACT

**Background:** Construction workers are frequently exposed to various types of injury-inducing hazards such as work at heights, excavation work and lifting of hazardous materials which are specific to this sector

**Aim:** The present study aims at evaluating the effect of first aid training program on construction workers' self-efficacy in Egypt.

**Design:** A quasi-experimental one-group pretest-posttest was used.

**Setting:** the study was conducted in a project site belonging to Concord Construction Company

**Sample:** Sample size was (138) construction workers out of (214).

**Tools:** Three tools were used: first tool was construction workers' assessment questionnaire, second tool was construction workers' first aid practice observational check list and third tool was construction workers' self-efficacy scale.

**Results:** Showed highly significant relations between knowledge, practice and self-efficacy among construction workers after participation in the first aid training program.

**Conclusions:** The results of this study indicated that first aid' knowledge and practice of construction workers had been improved after application of first aid training program. As well as there was improvement in first aid' self-efficacy with statically significance differences between pre, post and 3 months after application of the program.

**Recommendation:** Dissemination of first aid training program among other construction industries.

**Keywords:** Construction workers, First aid training program, self-efficacy

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## BACKGROUND

Construction is often classified and described as a high-risk industry as it has historically been plagued with much higher and unacceptable injury rates compared to other industries. Construction industry is one of the major sectors contributing to a high employment among workers. It has long since been considered as a hazardous occupation due to high incidence of occupational accidents that resulted in fatal injuries, permanent disability, temporary disability and occupational disease. There are enormous proportions of the occupational accidents in the construction industry; those accidents will have direct and indirect costs to not only the companies but also the country. (Abukhashabah, 2019).

Construction work involves a serious of occupational risks. Thus, construction is often classified as a high-risk industry as it has historically been plagued with much higher and unacceptable injury rates compared to other industries. Construction hazards may include falls from extreme heights, falling from rooftops, machinery failure, unguarded machinery, being struck by heavy construction equipment, electrocutions, accidents and structure collapses (Ikechukwu, 2020).

The occupational and environmental health nurse has an important role in the provision of health services to construction workers in the workplace. In addition, occupational and environmental health nurse can play a vital role in developing first aid training programs to improve construction workers' self-efficacy, thus, occupational and environmental health nurse can help workers in raising their awareness about the types of accidents and injuries which they may be exposed to in the

work site and how to make first aid according to the type of injury (Ikechukwu, 2020).

There are few studies conducted in Egypt in relation to the effect of first aid training program on construction workers' self-efficacy in Egypt. So, the results of this study will add to the nursing body of knowledge and will improve construction workers' self-efficacy, knowledge and practice related to first aid management. More over Implementation of first aid management at the time of injury will decrease the days of absenteeism and increasing the construction workers' productivity as well as saving the workers' life.

**Aim of the study:** The present study aims at evaluating the effect of first aid training program on construction workers' self-efficacy in Egypt.

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

H1: The post test- mean scores of first aid' knowledge of workers who are exposed to training program will be higher than the pre-test –mean scores.

H2: The post test - mean scores of first aid' practice of workers who are exposed to training program will be higher than the pre-test –mean scores.

H3: The post test - mean scores of first aid' self-efficacy of workers who are exposed to training program will be higher than the pre-test –mean scores.

**Research Design:** Quasi-experimental one group pre-test-post-test design was utilized to fulfill the aim of the study.

**Setting:** The current study conducted in one project site belonging to Concord Construction Company.

**Sample:** Sample size was (138) construction workers out of (214), the calculated sample number was chosen by simple random sample method.

**Inclusion criteria:**

- Construction workers who are working in the construction sector for at least 6 months.
- Workers above the age 18 years old
- Construction workers who are welcome to participate in the study

**Tools of Data Collection:**

**First tool: Construction workers' assessment questionnaire:** It was developed by the researcher and is divided into 3 parts:

**Part one: Construction workers' characteristics:** It was used only before the implementation of training program. It includes 12 questions about personal characteristics such as age and education.

**Part two: Work Place health hazards:** It includes 14 questions about the accidents and injuries that workers were exposed to them in the workplace like fracture, falling, electrical shock, bleeding and fainting.

**Part three: Construction workers' first aid knowledge:** It was used before, immediately and after 3 months from the implementation of the first aid training program. It includes 28 questions about first aid' knowledge.

**Scoring of Construction workers' first aid knowledge:** For each question, every correct answer was scored 1 and every incorrect answer or don't know was scored zero. Total knowledge was categorized as less than 50% is considered unsatisfactory, 50% to less than 75% is satisfactory and 75% or more is considered highly satisfactory ( Amro and Qtait,2017).

**Second tool: Construction workers' first aid practice observational check list:** It was developed by the researcher to assess the construction workers' first aid practices. It includes 8 questions about the steps of first aid procedures regarding bleeding, fracture, electrical shock and fainting.

**Scoring of Construction workers' first aid practices observational check list:** A score of one grade was given to those who done each step correct and complete, a score of zero was given to those either incorrect or did not done the steps. Total practices was categorized as less than 50% considered unsatisfactory, 50% to less than 75% is satisfactory and 75% or more is considered highly satisfactory (Abd El-Hay, Ibrahim and Hassan, 2015).

**Third tool: Construction workers' self- efficacy scale:** It was modified by the researcher to be applicable in the Egyptian community and the target population based on general self-efficacy (GSE) scale developed by (Schwarzer & Jerusalem,1995). Internal reliability for GSE = Cronbach's alphas between .76 and .90. Each item on the scale was ranged between 1 to 5 points. The higher score indicating more self-efficacy. It includes 10 questions related to construction workers' self- efficacy to perform first aid.

**Content Validity:** Five experts of community health nursing department, Cairo University were asked to check the tools for its content validity and modifications of content were done according to panel judgment on clarity of sentences and appropriateness of the content. Reliability of the knowledge tool and observational checklist as well as self- efficacy tools were tested using cronbach's alpha ( $r$ ) = 0.84, 0.86 and .88 respectively.

**Data collection procedure:** An official permission was obtained from Research Ethics Committee and related committees at Faculty of Nursing, Cairo University to conduct the study. An official permission was obtained from the manger of Concord Construction Company. The purpose and the nature of the study were explained to the construction workers. The researcher emphasized that, workers in the study were entirely volunteer, anonymity and confidentiality was assured through data code and written informed consent was obtained from workers.

The study was carried out on 4 phases: assessment phase, planning phase, implementation and evaluation phases.

Assessment phase, assessment of the construction workers' knowledge and practice by using structured interview questionnaire and observational checklist as well as self- efficacy questions.

Planning and designing phase: Based on the results of the assessment phase, comprehensive review of relevant literature, the researcher designed the first aid training program at computer lab to improve knowledge, practice and self- efficacy of the workers.

Implementation phase; Implementation phase: This phase was concerned with the implementation of the first aid training program. After the results obtained from assessment phase, the researcher develop first aid training program and started the educational and training session. Construction workers were divided into small groups of 8-9 workers for each session, (2 sessions per week for 2 months). Educational and training session included educational sessions for first aid' knowledge for "fracture, bleeding, electrical shock and fainting" and the researcher gave information about workplace health hazards and importance of wearing personnel protective equipment. During the training, educational methods such as health education, role-playing, question-and-answer, demonstration, re-demonstration and discussion were used. The construction workers were showed how to apply first aid techniques such as splint, CPR and how to stoop nose bleeding on each other. Then, the construction workers were re-demonstrated these techniques taught by the researcher. First aid practices of the construction workers were evaluated by using an observation checklist. In this form every action of the participants was evaluated as done or not done, and then they were graded.

During evaluation phase, the researcher reassesses the same construction workers by using the same tools post and three months after implementation of the first aid training program in order to assess the degree of the knowledge, change in their practice and self –efficacy after implementation of the first aid training program.

**Ethical and legal considerations:** A written approval was obtained from the Committee of Research Ethics at the Faculty of Nursing, Cairo-University and from the manager of the concern construction company. The researcher informed the workers that all data gathered during the study would be confidential and they had the right to withdraw from the study at any time without giving any reason and without any pressure from the head of the company.

**Statistical Analysis:** Statistical Package for the Social Sciences (SPSS) program, version 20. Numerical data

were expressed as means and standard deviations. Quantitative data were expressed as frequencies and percentages. Comparison between pretest, posttest, and 3 months follow up test was done by using t-test and ANOVA.

**RESULTS**

Table (1): Percentage distribution of construction workers' age, work experience and level of education (N=139)

Personal Characteristics	Frequency	%
Age		
18-30	44	31.7
30-50	64	46
>50	31	22.3
Mean+ SD	39.1±12.4 years.	
Level of education		
Not read or write	26	18.7
read and write	26	18.7
Basic Education	30	21.6
Secondary Education	47	33.8
University education	10	7.2
Work experience		
Less than 5 years	38	27.3
From 5 to less than 10	30	21.6
10 to less than 15	42	30.2
Over 15 years	29	20.9

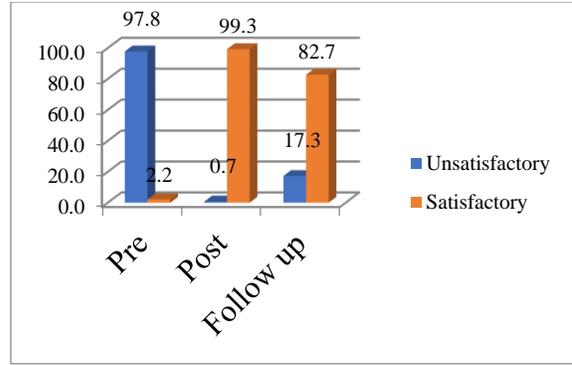


Figure (1) Differences in first aid' knowledge among construction workers in pre, post and 3 months after implementation of the program (N=139)

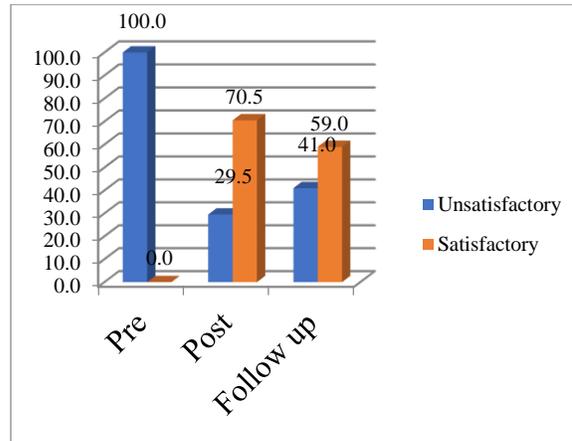


Figure (2): Differences in first aid' practice among construction workers in pre, post and 3 months after implementation of the program (N=139)

Table (2): Difference between self -efficacy of construction workers in pre, post, and 3 months after implementation of the program (N=139)

Items	Pre program			Post program			Follow up			ANOVA test	p-value
	Mean	SD	Mean( %)	Mean	SD	Mean( %)	Mean	SD	Mean( %)		
If I can't get first aid done the first time, I'll keep trying until I can	1.59	1.09	31.8	2.96	1.56	59.1	2.75	1.52	55.0	504.932	.0001*
When I want to teach first aid , I'm sure I can do it	1.56	1.02	31.2	3.01	1.57	60.3	3.12	1.50	62.3	313.486	.0001*
When I try to learn first aid , and not succeed in the beginning ,I will give up	1.56	0.99	31.2	3.00	1.49	60.0	2.70	1.43	54.0	38.169	.0001*
I can always do first aid for workplace injuries if I try too hard	1.56	0.98	31.2	3.02	1.50	60.4	2.80	1.40	56.0	54.639	.0001*
I am confident that I can deal efficiently with serious injuries	1.07	0.37	21.4	2.79	1.55	55.8	2.53	1.47	50.5	45.529	.0001*
I can provide first aid for any injury if I work hard	1.57	0.98	31.4	2.99	1.41	59.8	2.88	1.42	57.6	76.195	.0001*
I can remain calm when I suffer any injuries because I can provide first aid for any injury	1.56	0.99	31.2	3.00	1.49	60.0	2.70	1.43	54.0	45.529	.0001*
I feel dissatisfied with my ability to practice first aid	1.54	0.97	30.8	4.48	0.92	89.6	4.28	1.14	85.6	365.596	.0001*
I am a avoid watch or injuries to deal with it	1.86	1.37	37.3	1.31	0.88	26.2	1.70	1.37	34.0	7.464	.001*
If I meet a co-worker, I can find tools to do first aid work	1.59	1.09	31.8	2.96	1.56	59.1	2.75	1.52	55.0	38.169	.0001*

\*significant at p-value <0.05

Table (1) asserts that, construction workers aged from 30-50years old represented (46%) with mean of 39.1±12.4 years. Concerning level of education, (33.8%) of construction workers had got secondary education and 30.2% of construction workers had work experience of 10 to less than 15 years.

Regarding first aid' knowledge among construction workers, figure (1) illustrates that only 2.2% of construction workers had satisfactory level in pretest increased to 99.3% and 82.7% in post, and 3 months after implementation of the program respectively.

Figure 2 clarifies that, the percentage of construction workers who had satisfactory level of first aid' practice increased from 0% in pretest to 70.5% and 59% in post and 3 months after implementation of the program respectively.

Table (3) indicates a significant increase in score of first aid' self-efficacy among construction workers in pre, post and 3 months after implementation of the program (P=.0001).

Table (3): Relation between knowledge, practice and self- efficacy (N=139)

Scores	Practice		Self- efficacy	
	R	P	R	P
Knowledge	0.69	0.0001*	0.48	0.0001*
Practice	1		0.18	0.0001*

\*significant at P-value <0.05

The current study results indicates positive statistically significant relation between knowledge, practice and self-efficacy among construction workers (P=.0001).

## DISCUSSION

The accidents in the construction industry often have severe consequences on the workers, their families and the public. This industry sometimes records almost six times as many fatalities per hour worked and twice as many disabling injuries, as most other industries (Kalatpour and Khavaji, 2016).

The results of the current study showed an improvement in construction workers' first aid' knowledge, practice and self-efficacy after implementation of first aid training program and this results in accordance with many researches as the study done by El-Sharkasy, Shenouda, El-Sheikh, Gida and El-Shahat, 2015 in Port Said on 100 car drivers to determine the impact of first aid training program directed to car-drivers about road traffic injuries in Port Said. The study results indicated that the majority of the study sample (99%) had unsatisfactory first aid' knowledge before intervention of the program, However, there was significant improvement in knowledge of the entire sample (80%) and (76%) satisfactory after implementation of the program.

The results of the current study was supported with study done by Abd El-Hay, Ibrahim and Hassan,2015 in Egypt on 60 industrial school students with the aim to assess the effect of training program on students 'knowledge and practice regarding first aid and basic life support in industrial secondary schools, the result of this study indicated that 100% of industrial school students had poor practice regarding first aid and basic life support in the pretest, moreover the majority (86.7%),(78.3%) of them had good practice regarding first aid and basic life support in the posttest and follow up test respectively.

Regarding construction workers first aid' self –efficacy, the results of the current study contracted with the results of a study done by, Karima, Nuraeni& Mirwanti,2019 in a University in Bandung on 65 first responder with the aim to assess the knowledge and self-efficacy of first responders in doing first aid,

The results of the self-efficacy assessment showed that the majority of respondents (95.5%) have high self-efficacy.

The current study results indicates positive statistically significant relation between knowledge, practice and self-efficacy among construction workers (P=.0001). This results in the same line with the study done by Abd El-Hay, Ibrahim and Hassan,2015 in Egypt on 60 industrial school students with the aim to assess the effect of training program on students 'knowledge and practice regarding first aid and basic life support in industrial secondary schools, the result of this study indicated that there were statistically significant improvement in the score of total knowledge and total practice of the studied students regarding first aid and basic life support with positive correlation between their knowledge and practice throughout the study at P = 0.004.

## CONCLUSION

The results of this study indicated that first aid' knowledge, practice and self-efficacy among construction workers had been improved after application of first aid training program with statically significance differences between pre, post and 3months after implementation of the program.

**Recommendations:** Based on the results of the current study, the following recommendations are suggested:

- 1- Dissemination of first aid training program among other construction industries.
- 2- Future researches should be implemented to study the effect of first aid training program on workers' self-efficacy on another sample and in different settings.

**Source of Support:** Self

**Conflict of Interest:** None

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